Cornell University

Courses of Study

1985–86
Cornell University Calendar 1985-86

**Fall Semester**
Saturday, August 24

Tuesday and Wednesday, August 27 and 28
Thursday, August 29

Monday, September 9
Friday, September 20

Friday–Sunday, October 4–6
Saturday, October 19
Wednesday, October 23
Saturday, October 26

Monday–Friday, October 28–November 8
Wednesday, November 27
Monday, December 2
Saturday, December 7
Monday–Wednesday, December 9–11
Thursday, December 12
Saturday, December 21

**Winter Session**
Variable periods between Thursday, December 26, and Wednesday, January 22

**Spring Semester**
Monday, January 20
Tuesday, January 21
Thursday and Friday, January 23 and 24
Monday, January 27

Monday, February 10
Friday, February 14
Saturday, March 22
Monday, March 31
Monday–Friday, April 7–18
Saturday, May 10
Sunday–Wednesday, May 11–14
Thursday, May 15
Saturday, May 24

Sunday–Saturday, May 25–31
Sunday, June 1

**Summer Session 1986**
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.
University Administration

Frank H. T. Rhodes, president of the University
Robert Barker, University provost
Thomas H. Meikle, Jr., provost for medical affairs
William G. Herbster, senior vice president
Joseph M. Ballarityne, vice president for research and advanced studies
William D. Gurowitz, vice president for campus affairs
Harold D. Craft, Jr., acting vice president for facilities and business operations
James E. Morley, Jr., vice president and treasurer
Richard M. Ramin, vice president for public affairs
James A. Sanderson, chief investment officer
John R. Egner, associate provost
Barry B. Adams, vice provost for undergraduate education
Kenneth M. King, vice provost
James W. Spencer, vice provost
Walter J. Relihan, Jr., University counsel and secretary of the corporation
Joseph B. Bugliari, dean of the University Faculty
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. While, 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 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, in this spirit of pioneering, Cornell should admit its first women 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 presided over 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, and 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, with the result 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. The Engineering College divided into any branches, 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 Library Science. Administration, new called the Samuel Curtis Johnson Graduate School of Management. Among the statutory colleges the College of Agriculture took a new title, the College of Agriculture and Life Sciences. So did the College of Home Economics; it became the College of Human Ecology. The Veterinary College became the College of Veterinary Medicine. And there was a new school, the School of Industrial and Labor Relations. The process of expansion carried beyond Ithaca. A vast medical school arose in New York City; an agricultural experiment station at Geneva, New York; a marine laboratory off the New England coast; and a government study center at Washington, D.C. More remote is the National Astronomy and Ionosphere Center in Puerto Rico, which has the world’s largest radio-radar telescope.

Cornell University has come to be a place of learning whose 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 student and professor a sense of security. The security comes from being heir to a century of Cornell’s history and of having available in libraries and art galleries and concert halls the words of wise men and the creations of artists. And more than security. To the student, what could be more stimulating than to know that he or she has joined a community that affords infinite opportunity for study, for new friendships, and for association with persons dedicated to the pursuit of knowledge?

Frederick G. Marcham
Goldwin Smith Professor of English History emeritus

The Students

Cornell University has a student body of about 17,000, which includes seven undergraduate divisions of about 12,000 students and four graduate divisions of about 5,000 students in Ithaca. The student body is diverse in interests and background, with 49 percent of the undergraduates from New York State, 43 percent from the remaining fifty states, and 8 percent from over ninety 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>1,779</td>
</tr>
<tr>
<td>New York State</td>
<td>8,591</td>
</tr>
<tr>
<td>Mid-Atlantic</td>
<td>2,610</td>
</tr>
<tr>
<td>Southeast</td>
<td>552</td>
</tr>
<tr>
<td>Midwest</td>
<td>1,288</td>
</tr>
<tr>
<td>Southwest/Mountain</td>
<td>350</td>
</tr>
<tr>
<td>Far west</td>
<td>847</td>
</tr>
<tr>
<td>Foreign and United States possessions</td>
<td>1,554</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17,571</strong></td>
</tr>
</tbody>
</table>

*Figures are for fall 1984 and do not include extramural students, students registered in absencia, 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.

Retention and Graduation of Undergraduates

By fall 1984, 82 percent of the first-time freshmen who entered the endowed undergraduate units in fall 1978 (Architecture, Art, and Planning; Arts and Sciences; Engineering; and Hotel Administration) had graduated. In the statutory units (Agriculture, Life Sciences, Human Ecology, and Industrial and Labor Relations), 85 percent of the first-time freshmen who entered in fall 1978 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 other 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 an undergraduate library for students 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 138,000 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 Johnson Graduate School of the College of Architecture, Art, and Planning; the libraries of the Agriculture Quadrangle, Mann Library’s open stacks, located at the east end of the Agriculture Quadrangle, Mann Library’s open stacks hold half 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 Administration, 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 many lectures, art demonstrations, film screenings, workshops, music and dance performances, and other programs.

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 256-6464.

Art exhibitions. Cornell is generously supplied with art exhibitions, some permanent and some temporary. The displays range from the works of students and visiting collectors to the permanent Johnson collection housed at the Herbert F. Johnson Museum of Art. Other campus locations for art displays include the Art Room in Willard Straight Hall, the Harttell Gallery in Sibley Hall, and the galleries in Goldwin Smith Hall, Martha Van Rensselaer Hall, and Olive Tieden 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 College Musica.um, and the Indonesian Gamelan. The Cornell chimes, housed in McGraw Tower, are run 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 groups in the Statler Series at Alice Statler Auditorium, and occasional operas, ballets, and special events. Several times each month the Department of Music sponsors free concerts and lectures by visiting artists or by Cornell faculty and students, primarily in Barnes Hall Auditorium. The Cornell Concert Commission offers a series of student-produced popular rock, folk, soul, and jazz concerts. Other student organizations have regular performances of Gilbert and Sullivan operettas, jazz, and folk music. Local bluegrass and folk performers are featured in informal concerts in the Commons, a coffeehouse in Anabel Taylor Hall.

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-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. 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-telescope astronomy.

Theater

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

Under the sponsorship and general supervision of the Department of Theatre Arts, Theatre Cornell presents a full season of classical, modern, and experimental dramas. Student productions include guest professionals and graduate actors from the department’s professional training program, as well as undergraduate majors. All students in the University who are interested in participating in theater in any capacity are eligible to audition for these productions. Auditions for main stage and studio productions are held twice a year. Additional events are produced each semester by the Theatre Cornell group, open to all undergraduates.

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 subjects of narrow interest to lectures by well-known speakers with campus-wide 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.
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 Shoosis 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 the newest research facility on campus. It is expected to have a profound effect on submicron microelectronics and other interdisciplinary research that requires microminiaturization. The Laboratory of Nuclear 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 is equipped with highly sophisticated equipment for interdisciplinary research. 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 has two computer graphics facilities, one for instruction and one for research.

The world's largest radio-radar telescope, in the National Astronomy and Ionosphere Center, in Puerto Rico, is operated by the University.

**Social Sciences**

Uris Hall (Department of Psychology) houses the human experimental laboratory, laboratories in biopsychology and social psychology, and the Eleanor J. Gibson 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 both 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. 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 systems with attached array processors, a VAX 750, and a DECsystem-2060. Public terminal clusters are located in twelve different areas on campus, and they house approximately three hundred workstations, including more than 125 microcomputers. The number of public microcomputers will continue to increase. A computer graphics area for public use is located in Uris Hall. New Macintosh microcomputer centers in Uris Library and Goldwin Smith Hall and a terminal room in the Dickson Hall residence opened in 1984–85. A laser printer has also been installed in Warren Hall for public use.

Cornell is attached to Telnet and Tymnet, 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 computer 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.

**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...
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: 256-4386).
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.

Students are admitted for one semester but may be allowed to continue in the division for a second term if that is necessary and the student is making progress toward transfer.

Business and Preprofessional Study

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 under-graduate 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 welfare and lifestyle 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, the private, public, and mixed sectors of the economy.

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 Development Planning. There are additional programs that allow students 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-registrar 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 and no undergraduate course of study that is totally inappropriate. Prelaw students should, however, 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, ethics, and philosophy, because of the influence of philosophy in reasoning on "legal reasoning" and jurisprudence. Psychology leads to an understanding of human nature and mental 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 some, a broad scientific background—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 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.

Premedial 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, 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 premed program, successful Cornell applicants to medical and dental schools have been enrolled primarily in the Colleges of Arts and Sciences, and Agriculture and Life Sciences, with some also in the Colleges of Engineering and Human Ecology. 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 by the Office of Admissions, New York State College of Veterinary Medicine, Cornell University, C117 Schurman Hall, Ithaca, New York 14853-6401.

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 14853-6921.

Prevetnery Study
There is no specific prevetnery 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 prevetnery 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, New York State College of Veterinary Medicine, Cornell University, C117 Schurman Hall, Ithaca, New York 14853-6401.
Interdisciplinary Centers and Programs

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
Turner, James E., Ph.D., Union Grad. Sch. at Antioch Coll. Assoc. Prof., 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 while in residence.

Term Ending in 1986

Argoni, Dullio, 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, neurophysiologist. Rockefeller University
Lovász, László, mathematician. Eötvös Lorand University, Budapest
Rich, Adrienne, poet

Term Ending in 1988

Baxandall, Michael, art historian. The Warburg Institute
Bourlaug, Norman E., plant scientist. International Maize and Wheat Improvement Center, Mexico
Derrida, Jacques, philosopher and literary critic. Director, Collège International de la Philosophie, Ecole Pratique des Hautes Etudes, Paris
Garwin, Richard L., physicist. IBM Thomas J. Watson Research Center
Shaw, Margery W., geneticist, physician, lawer, Institute for the Interprofessional Study of Health Law, Houston

Term Ending in 1989

Cox, David R., statistician. Imperial College of Science and Technology, London
Cover, Sri Kenneth, classicalist, 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
Welty, Eudora, novelist and short story writer

Center for International Studies

Faydyl J. Greenwood, director; Elisabeth M. Thorn, administrative manager

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.

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 (190 Uris Hall)
Western Societies Program (130 Uris Hall)
Comparative Studies in Professionalism and Professional Education (170 Uris Hall)
International Internships (165 Uris Hall)
International Agriculture Program (261 Roberts Hall)
International Legal Studies (309 Myron Taylor Hall)
International Medicine (Cornell Medical College)
Program in International Nutrition (272 Sage Hall)
International Political Economy (180 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:

Cornell Abroad (170 Uris Hall), Arch Dotson, associate director; Ann Roscoe, executive staff assistant
One major function of the center is the University-wide coordination of international experiences for undergraduate students. Programs being developed include study abroad opportunities and summer internships. Cornell Abroad (Cornell-sponsored study abroad program) begins operation in 1985.

International Internship Programs. Billie Jean Isbell, director
An international internship program for undergraduate and graduate students begins in summer 1985. Admission is by application only. The 1985 sites are Venezuela, Panama, and Mexico.

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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; for titles and descriptions of courses to be given in 1985—86 consult the office of the vice provost for undergraduate education, 309 Day Hall.

Courses

The Conflict between Science and Religion (History 448)
Health and Disease (German Literature 327, Biology and Society 327, and Psychology 383)
Human Development in Postindustrialized Societies (Human Development and Family Studies 485 and Psychology 485)
The Power of Nationalism: Expressions of National Feelings in Politics, Music, and Literature (Russian Literature 390)
Rhythms: Their Significance in Biology, Psychology, Anthropology, Music, and Other Studies (Music 312, Science and the Computer (Computer Science 406)
Science, Risk, and Public Policy (Engineering 400 and Economics 358)
Science, Technology, and the American Economy (Industrial and Labor Relations 451)
Signs and Communication (Comparative Literature 408 and Linguistics 408)
Work, identity, and the Nature of American Community (Industrial and Labor Relations 683)

Cornell-in-Washington Program

Cornell-in-Washington is a program of instruction, research, and internships in the nation's capital. The program is open to qualified juniors, seniors, and graduate students from participating colleges, schools, and divisions of the University. Full academic credit can be earned for the semester. Programs are offered in public policy and architecture. Public policy students enroll in an interdisciplinary course, Projects in Public Policy (Government 500/HDF 404), which involves a major research study carried out through an internship, and the Workshop in Analytic Methods (Government 500.8). 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 seminars from such fields as government, history, economics, human development and family studies, architectural history, and agricultural economics. A description of the Architecture Program may be found in the College of Architecture, Art, and Planning section. All seminars are taught by Cornell faculty and
may be obtained from the program office, 632 Clark Hall (telephone: 256-3810).

**Biology and Society Courses**

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

History of Biology (History 287, Biological Sciences 201, and Biology and Society 301)

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

History of Biology (History 288, Biological Sciences 202, and Biology and Society 298)

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

Biological and Society Senior-Seminars (Biology and Society 400–414)

Environmental Chemicals and Maladies (Biological Sciences 304 and Biology and Society 304)

Alternative Food Production Systems (Biological Sciences 302 and Biology and Society 302)

Biosocial Basis of Sex Differences (Women's Studies 214, Biological Sciences 214, and Biology and Society 214)

Professional Ethics (Biology and Society 311)

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

Human Growth and Development (Human Development and Family Studies 347, Nutritional Sciences 347, and Biology and Society 347)

Independent Study (Biology and Society 375)

Health and Disease (German Literature 327, and Psychology 327)

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

Social Policy and Economic Growth (Management 685 and Biology and Society 685)

Health Work: Controversies and Challenges (Biology and Society 106)

Living on the Land: Images of Rural Life in America (Biology and Society 507)

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

Culture and Human Disease (Anthropology 386 and Biology and Society 386)

American and International Agriculture: Past, Present, and Future (Biology and Society 400)

Genetics and the Law: Making Better Babies (Biological Sciences 400 and Biology and Society 400)

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)

Special Problems in the Anthropology of Sex and Gender (Anthropology 422, and Psychology 327)

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

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

The Social Functions of Law and Medicine (Biologiy and Society 408)

Agriculture, Society, and Biotechnology (Rural Sociology 405 and Biology and Society 408)

Population Policies (Sociology 531 and Biology and Society 414)

Ways of Seeing (Biology and Society 100)

Hard Choices (Sociology 100.7 and Biology and Society 102)

Writing as a Naturalist (Biology and Society 103)

Ecosystems and Ego Systems (Biology and Society 104)

Health Dialogues: Personal and Political (Biology and Society 105)

**Other Courses by STS Faculty**

The Politics of Technical Decisions I (Sociology 515, and 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)

**Program in Comparative and Environmental Toxicology**

C. F. Wilkinson, director, N202 Martha Van Rensselaer Hall, 256-8112 or 256-8110.

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 at 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 man) 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 are listed below, and details of course content are provided elsewhere in the catalog under the listings of the course department.

Further information concerning the program and the development of new courses may be obtained through the ICET office, N202 Martha Van Rensselaer Hall (telephone: 256-8112).

Tox 304 Chemicals, Enzymes, and Maladies (Biological Sciences 304 and Biology and Society 310)

Tox 370 Pesticides in the Environment (Entomology 370)

Tox 418 Mutagenesis and Genetic Toxicology (Animal Science 418)

Tox 419 Animal Cytogenetics (Animal Science 419)

Tox 438 Cell Proliferation and Oncogenic Viruses (Biological Sciences 438)

Tox 433 Managing the Aquatic Environment (Natural Resources 433)

Tox 528 Pharmacology (Veterinary Medicine 528)

Tox 665 Ecology and Management of Disturbed Aquatic Systems (Natural Resources 665)

Tox 667 Ecotoxicology (Natural Resources 667)

Tox 669 Effects of Ecological Perturbations on Fishes (Natural Resources 669)

Tox 670 Introductory Chemical Toxicology (Food Science 670)

Tox 671 Molecular Toxicology (Nutritional Sciences 671)

Tox 675 Environmental Law (Civil and Environmental Engineering 675)
**Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tox 621</td>
<td>Toxicology (Veterinary Medicine 621)</td>
</tr>
<tr>
<td>Tox 627</td>
<td>Regulation of Toxic Substances (Civil and Environmental Engineering 627)</td>
</tr>
<tr>
<td>Tox 640</td>
<td>Principles of Toxicology Pathology (Veterinary Medicine 640)</td>
</tr>
<tr>
<td>Tox 651</td>
<td>Nutrition and the Chemical Environment (Nutritional Sciences 651)</td>
</tr>
<tr>
<td>Tox 660</td>
<td>Safety Evaluation in Public Health (Veterinary Medicine 660)</td>
</tr>
<tr>
<td>Tox 690</td>
<td>Insect Toxicology and Insecticidal Chemistry (Entomology 690)</td>
</tr>
<tr>
<td>Tox 700</td>
<td>Ecotoxicological Methods (Natural Resources 700)</td>
</tr>
<tr>
<td>Tox 702</td>
<td>Seminar in Environmental and Nutritional Toxicology (Nutritional Sciences 702)</td>
</tr>
<tr>
<td>Tox 751</td>
<td>Dilemmas for Toxicologists (and Other Scientists) (Biological Sciences 751)</td>
</tr>
<tr>
<td>Tox 699</td>
<td>Current Topics in Environmental Toxicology (ID 699)</td>
</tr>
</tbody>
</table>

**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 or both on the basis of departmental examinations. Students with foreign credentials who feel they may be eligible for advanced standing policy for foreign credentials may contact the Associate Director of 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.

**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**

Ruth K. Stanton
192 Roberts Hall
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 introductory biology credits (four advanced placement credits). A score of 5 on the CEEB examination entitles a student to 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.

Advanced Placement Examination in Chemistry

Students who score 4 or 5 on the CEEB Advanced Placement Examination in chemistry or by passing an advanced placement test may receive four or 8 credits. A score of 4 or 5 on the BC examination satisfies the distribution requirement in mathematics for students in 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 in European history and four credits to those with such scores in the American history examination. These credits may not be used to fulfill requirements of the history major or distribution requirements of the College of Arts and Sciences.

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. 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, 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;
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.

German Literature

The Department of German Literature will grant three credits to students who score 4 or 5 on the Advanced Placement Examination. For information about the College Placement Test, see "Modern Languages," below.
### 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><strong>Arabic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(majors)</td>
<td>5</td>
<td>8 credits</td>
<td>Placement out of all introductory courses.</td>
</tr>
<tr>
<td>(nonmajors)</td>
<td>5</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>Chemistry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>8 credits</td>
<td>Placement out of all introductory courses.</td>
</tr>
<tr>
<td></td>
<td>3,4</td>
<td>4 credits</td>
<td>Satisfies the introductory biological sciences distribution requirement.</td>
</tr>
<tr>
<td>Computer science</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Department determines credit and placement based on CEEB Achievement Examination.</td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td></td>
<td>Department determines credit and placement.</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
<td>Department uses additional measures. Qualified students are notified.</td>
<td></td>
</tr>
<tr>
<td>French language</td>
<td>4,5</td>
<td>3 credits</td>
<td>Department determines placement. Students may earn additional credit by taking CASE examination.</td>
</tr>
<tr>
<td>French literature</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>German language</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></td>
<td>5</td>
<td>3 credits (and proficiency)</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td>German literature</td>
<td>4</td>
<td>3 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td>Greek</td>
<td>4,5</td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
</tr>
<tr>
<td>Hebrew</td>
<td></td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
</tr>
<tr>
<td>American history</td>
<td>4,5</td>
<td>4 credits</td>
<td></td>
</tr>
<tr>
<td>European history</td>
<td>3</td>
<td>4 credits</td>
<td></td>
</tr>
<tr>
<td>History of art</td>
<td>4,5</td>
<td>3 credits</td>
<td></td>
</tr>
<tr>
<td>Italian literature</td>
<td>4,5</td>
<td>3 credits (and proficiency)</td>
<td>Department of Romance Studies determines placement. Students may earn additional credit by taking departmental examination.</td>
</tr>
<tr>
<td>Latin</td>
<td>4,5</td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
</tr>
<tr>
<td>Mathematics BC</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></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>Mathematics AB</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></td>
<td>3</td>
<td>4 credits</td>
<td>Placement out of 111. Permission to take 112 or 192.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>none</td>
<td>Students are strongly urged to take the mathematics placement examination.</td>
</tr>
<tr>
<td>Music</td>
<td></td>
<td>Department determines credit and placement based on departmental examination.</td>
<td></td>
</tr>
<tr>
<td>Physics B</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>Physics B, and Mathematics BC</td>
<td>4,5</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>Physics C—Mechanics</td>
<td>4,5</td>
<td>4 credits</td>
<td>Placement out of Physics 112 or 207.</td>
</tr>
<tr>
<td>Physics C—Electricity and Magnetism</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.</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>Psychology</td>
<td>4,5</td>
<td>3 credits</td>
<td>Department determines placement. Students may earn additional credit by taking CASE examination.</td>
</tr>
<tr>
<td>Sociology</td>
<td></td>
<td>Department determines credit and placement.</td>
<td></td>
</tr>
<tr>
<td>Spanish language</td>
<td>4,5</td>
<td>3 credits</td>
<td>Department determines placement. Students may earn additional credit by taking departmental examination.</td>
</tr>
<tr>
<td>Spanish literature</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.
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 in a language should consult the Department of Near Eastern Studies on language course placement, or Linguistics designates a professor to handle placement for that language. Students who have had a year of formal study in a language should consult the Department of Near Eastern Studies or should consult Professor S. Stucky, 218 Lincoln Hall. Special arrangements are made for nonnative speakers of a language other than English who may require special placement advice. Students may not take 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.

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, or a special departmental examination. To be eligible for Cornell's Advanced Standing Examination, students must have completed four or five years of study above the reading level 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. Credit is based on performance on the CEEB Advanced Placement Examination, Cornell's Advanced Standing Examination, or a special departmental examination. To be eligible for Cornell's Advanced Standing Examination, students must have completed four or five years of study above the reading level 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.

3) 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. Credit is based on performance on the CEEB Advanced Placement Examination, Cornell's Advanced Standing Examination, or a special departmental examination. To be eligible for Cornell's Advanced Standing Examination, students must have completed four or five years of study above the reading level 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.

4) 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. Credit is based on performance on the CEEB Advanced Placement Examination, Cornell's Advanced Standing Examination, or a special departmental examination. To be eligible for Cornell's Advanced Standing Examination, students must have completed four or five years of study above the reading level 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.

5) 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. Credit is based on performance on the CEEB Advanced Placement Examination, Cornell's Advanced Standing Examination, or a special departmental examination. To be eligible for Cornell's Advanced Standing Examination, students must have completed four or five years of study above the reading level 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.

Music

Advanced placement and credit are awarded on the basis of the CEEB Advanced Placement Examination in music (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

Advanced placement and credit are awarded only 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 departmental 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.

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 further courses in psychology should consult a faculty member in the Department of Psychology, Cornell University, 214 Uris Library.

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 Placement in French or Spanish literature or in French or Spanish language.

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

Near Eastern Studies

For advanced placement and credit in Hebrew and Arabic, students should consult the Department of Near Eastern Studies, Cornell University, 208 Rockefeller Hall.

Special Academic Services and Programs

Special Academic Services and Programs

Freshman Seminar Program

Each semester, the Freshman Seminar Program presents a choice of more than seventy courses offered by over twenty 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) of 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 Seminar Program. 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 194 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 can...
often 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 separate from University course registration. The dates for Freshman Seminar fall registration and course exchange appear in the Freshman Seminar brochure; the dates for spring 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 Fredric V. Bogel, professor of English; the assistant director is Katharine K. Gotschall, senior lecturer in English. The executive staff assistant is Mark E. Hamblet. The program's offices are in 159 Goldwin Smith Hall (telephone: 256-4061).

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 HEOP, EOF, COSEP, or the Division of Unclassified Students. The LSC provides supplemental instruction in core courses (biology, chemistry, mathematics, physics) and tutorial and study sessions. A prefreshmen 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 typewriters, microcomputers, a reserve library, an examination file, audio study-tapes, and vending.

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 of 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 in virtually every field. For more information, students should call 256-5833 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 1985 with program sites in Great Britain, Denmark, Spain, Germany, Switzerland, Israel, and Egypt. Programs in Spain, Switzerland, and Germany require the equivalent to two years of college-level language study. Spain 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 Burgertt, 17 Roberts Hall
Architecture, art, and planning
Professor Stan Bowman, 102 Tjaden Hall
Arts and sciences
Assistant dean Beatrice Rosenberg, 56 Goldwin Smith Hall
Engineering
Associate dean Richard Lance, 235 Thurston Hall
Hotel administration
Assistant dean David Dunn, 141 Statler Hall
Human Ecology
Bruce Harding, 154 Martha Van Rensselaer Hall
Industrial and labor relations
Maggie Larson, 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 Center for International Studies, or from the director of undergraduate studies in each department.

Field Study

Field service provides students with invaluable experience, integrating theory with practice. Most opportunities are offered through individual departments or colleges and are described in those sections.

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

The Career Center, an academic support service, works in conjunction with college career planning and placement offices to help students explore, discover, and choose a career. It 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 and student advisers are available. Offices are located in two buildings, Sage Hall and Barnes Hall, and are open Monday through Friday from 8:00 a.m. to 4:30 p.m.

The office in Sage Hall, at 14 East Avenue (telephone: 607/256-5221), 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 video- and audiotapes. It also offers seminars on applying to graduate and professional schools, aids students in job hunting through on-campus interviews with employers, and provides special programs and advice for minority students.

The office in 203 Barnes Hall provides academic and career counseling to individuals and groups, conducts academic and vocational testing, and gives language placement tests for students enrolling in foreign language courses (telephone: 256-5044). 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 and provides special information resources and advice for students interested in careers or professional schools in the health fields.

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

The University
accommodations in residence hall facilities are available for individual students.

Kathleen Donovan, Office of Equal Opportunity, 234 Day Hall (telephone: 256-5298), 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 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, Arts and Sciences, and Engineering, and the School of Hotel Administration). These programs are called EOP and HEOP respectively.

HEOP and EOP give students who would not be admitted through regular admission selection an opportunity to attend Cornell. The programs provide students with academic supportive services, counseling, and financial aid. Regardless of their ethnic background, New York State residents who are both academically and economically disadvantaged are eligible.

Student Services

Services include student activities, work-study jobs, leadership training, and assistance in development of organizational skills and implementation of programs. A general counseling-referral service is also provided by the office. COSEP has associate staff members in the Financial Aid Office, the Career Center, and Gannett Psychological Service to assist students in these areas.

Office of Minority Educational Affairs

Over the years Cornell has made considerable strides in enriching the academic, cultural, and social experience of minority students through the Office of Minority Affairs. This office, which is the center of activity for minority students, ensures that a variety of support services are available to assist students in making a more positive academic and social transition to the University. The Office of Minority Affairs represents many things to many people. For some it serves as a forum for political, social, and educational expression. For others it is a home-away-from-home, a place where student organizations evolve, helping to enhance cultural awareness. There are over four hundred organized clubs on campus, and minority student clubs are among the most active. Listed below are many of the organizations of special interest to minority students.

Alpha Kappa Alpha
Alpha Phi Alpha
American Indian Science and Engineering Society
Asian American Coalition
La Asociación Latina
Black Bio-Medical Technical Association
Black Graduate Business Student Association
Black Graduate Student Association
Black Greek Council
Black Students United
Chinese Cultural Society
Le Club Haitien
Cornell Chinese Students Association (CASA)
Cornell Chinese Dance Company
Cornell Chinese Students Association
Cornell Korean Society
Cornell Prison Project
Delta Sigma Theta
Ehos Yearbook
Hong Kong Student Association
Human Ecology Minority Student Association
The Ithaca Ethiopian Drought Committee
Kappa Alpha Psi
Mexican American Student Association (MASA)
Minority Industrial and Labor Relations Student Organization (M.I.R.S.O.)
Minority Undergraduate Law Society
Minority Undergraduate Veterinary Association
National Society of Black Engineers (NSBE, C.U. chapter)
North American Indians at Cornell (N.A.I.S.C.)
Omegá Psi Phi fraternity
Delta Mu chapter
Pamoja-Ni Gospel Choir
Phi Beta Sigma fraternity
Society of Hispanic Professional Engineers
The South African
Divestment Coalition
Sphinx Literary Society
State of Black America
Coordinating Committee
Third World Student Programming Board
La Unidad Latina/Lambd
Upällon Lambda
West Indian Students Association
Zeta Phi Beta Sorority, Inc.

International Student Office

The International Student Office, 200 Barnes Hall (telephone 607/256-5243), serves as an information center and provides arrival assistance, housing information, personal and academic advising and counseling, immigration advising, and financial planning assistance.

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. Financial aid is 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.

Loans and Employment

Short-term emergency loans are available through the International Student Office for students who face unexpected financial crises. Under certain circumstances, long-term loans are also available.

Nonimmigrant foreign students are not eligible for the federal work-study program administered by the Student Employment Office. Foreign students holding F-1 visas may accept non-work-study employment on campus for up to twenty hours a week. Because of visa restrictions, foreign students may not accept any off-campus employment without permission of the United States Immigration and Naturalization Service.

Questions regarding permission to work should be referred to the International Student Office.

Health Requirements

Foreign students and their dependents must present a chest X-ray taken within twelve months of registration at Cornell or undergo an X-ray upon arrival. X-ray service is available at the Gannett Health Center. Residents of the following areas are exempt from this chest X-ray requirement: Europe, Japan, Australia, New Zealand, and Canada.

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

Registration

All entering nonimmigrant foreign students (including Canadians) must secure clearance from the International Student Office before registration will be permitted.

Leaves of Absence, Withdrawals, Transfers, Credit-Hour Reductions

Any nonimmigrant foreign student planning to take a leave of absence should check first with the International Student Office. Students taking a leave or withdrawing from the University normally cannot legally remain in the United States. Students graduating or leaving the University should file a Notice of Departure with the International Student Office. Students intending to transfer to other universities in the United States should check the immigration regulations regarding transfer in the International Student Office.

Visa regulations also stipulate that students must carry at least twelve credits each term. Foreign students who are planning to drop their course load below twelve credits should contact the International Student Office to determine how such a decision will affect their visa status and financial aid.

Personal Counseling Services

University Health Services. Counseling services are provided in the health center and the Psychological Service. For an appointment with the Psychological Service, students may call 256-5208 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 256-4782.
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: 256-4214).

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 256-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 Anabel Taylor Hall (telephone: 256-4211 and 256-3608).

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: 272-1116).

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: 256-4221) 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 Bath 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 entries (including one vegetarian entry at both lunch and dinner) each day. In addition, "prime 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 intersession, spring recess, and summer.

The Co-op Dining program is administered by Cornell Dining, 233 Day Hall (telephone: 256-8581). 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 plan. University 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.

Cash à-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, intersession, and spring break.

The Pick-Up offers a variety of grocery items, beverages, magazines, and personal items. A convenient check-cashing service and a small game room are also provided. The Pick-Up is located on the lower level of Noyes Lodge (telephone: 256-5314).

Vending operations provide food, beverage, and snack items in many campus buildings (telephone: 256-5385).
Catering
Cornell Catering serves the entire Cornell community, either in its private dining rooms, located on the third floor of Ryerson Hall, or in functions held in many campus locations. Cornell Catering offers Kosher Dining, and Cornell Catering serves the entire Cornell community, including Kosher meals are offered under the auspices of Moung 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 24/7. Normal hours are Monday through Friday from 8:30 to 11:30 a.m. and from 1:00 to 4:30 p.m., and Saturday from 8:30 a.m. to 12:30 p.m. Facility, 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 the fall semester 1985–86 will be approximately $570 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 256-6363.

Kosher Dining
Kosher meals are offered under the auspices of the Psychological Service, a student should call the Psychological Service, a student should call 256-5208 or go to the offices at the center. A doctor is available for emergencies twenty-four hours a day (telephone: 256-5165).

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 service
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 college, on weekend trips, 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 services. 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 the fall semester 1985–86 will be approximately $570 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 256-6363.

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 confused with the supplementary 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, CIVITAS (Cornell-Ithaca Volunteers-in-Training-and-Service), the Interreligious International Ministry (IRIM), noncredit courses, lectures, conferences, and involvement in varied services to the University community. A diverse staff of pastoral counselors and advisors, available day or night for consultation, may be reached through the office, 118 Anabel Taylor Hall (telephone: 256-4214). This office also has information concerning weekly religious 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 (CRESF), 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 policy 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 (telephone: 256-4321), assists all members of the Cornell community seeking solutions to a wide range of problems. The main purpose of the ombudsman is to provide the just and equitable resolution of conflicts in the University. The office is independent of the University administration and all other groups on the campus. All communications are confidential.

The office can provide information on University policies and practices, help examine alternatives, find proper authorities to resolve the situation, or otherwise seek a resolution to the problem. The function of the office does not take the place of existing grievance procedures, but it stands ready to help investigate complaints at any time. The office does not have the authority to reverse decisions or punish anyone. The office does make requests for reconsideration or change in decisions and provides an equitable solution when a complaint has merit. In addition to hearing and investigating complaints, the office may 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 Student’s Bill of 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
The University

opportunities for personal relationships among members of the community! and fulfill Willard Straight's minority and ethnic cultures. The services and activities Programming Board, which presents events to highlight outdoor setting; and the Third World Student summer orientation programs for new students in an major social events, including Mardi Gras and Commission, which produces popular concerts; the following: the Alfalfa Room, a lounge area in Warren Hall. Robert Purcell Union University Unions Program Board,.. which presents Unions and Activities programming organizations many special services available to students are a darkrooms, and a unisex hair-styling salon. Among the three University union buildings, which serve as the Department of Unions and Activities oversees the 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 B 2 Ives Hall (256-6492). 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, billiard 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 Alfalfa Room, a lounge area in Warren Hall where sundries and snacks are sold; Cornell Cinema, the campus film program; the Cornell Concert Commission, which produces popular concerts; the University Union Programming 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 cultures. The services and activities 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. - 11:00 p.m., 7 days a week
Noyes Center
10:00 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 p.m., Monday – Saturday
7:00 a.m. - 1:00 p.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 fifty fraternities at the University, with about twenty-five hundred students; or 37 percent of the male undergraduate students. There are sixteen sororities, with about eleven hundred students and 24 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 following: the Alfalfa Room, a lounge area in Warren Hall (256-6492). 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.

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 607-256-6200.

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 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
Weekdays: 11:15 a.m. and 1:30 p.m.
Saturday: 11:15 a.m.
Sunday: 1:00 p.m.
November 1 – March 31
Weekdays: 11:15 a.m. and 1:30 p.m.
Saturday: 11:15 a.m.
Sunday: 1:00 p.m.

Transportation Services

Traffic and Parking

To provide a safe walking environment for pedestrians on campus and a safe driving environment for vehicular traffic 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 University grounds) 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 ensures that the owner or operator may be readily 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. To assist any individual with general inquiries or special problems and requests (telephone: 256-4600).

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 256-4628 or CU Transit at 256-3782.

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: 256-1111). 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 11:00 a.m. to 4:00 p.m., Monday through Friday (telephone: 256-7194). Lost articles are often turned in to 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 256-7406.
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 256-7404.

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>3 weeks</td>
<td>$60</td>
</tr>
<tr>
<td>4 weeks</td>
<td>70</td>
</tr>
<tr>
<td>5 weeks</td>
<td>80</td>
</tr>
<tr>
<td>6 weeks</td>
<td>90</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>t</td>
<td>t</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

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m.</td>
<td>9:55 a.m.</td>
</tr>
<tr>
<td>10:10 a.m.</td>
<td>12:05 p.m.</td>
</tr>
<tr>
<td>12:20 p.m.</td>
<td>2:15 p.m.</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>4:25 p.m.</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>9:25 p.m.</td>
</tr>
</tbody>
</table>

2 hours and 25 minutes

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 a.m.</td>
<td>9:55 a.m.</td>
</tr>
<tr>
<td>10:10 a.m.</td>
<td>12:35 p.m.</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>4:25 p.m.</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>9:55 p.m.</td>
</tr>
</tbody>
</table>

3 hours

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:20 a.m.</td>
<td>11:00 a.m.</td>
</tr>
<tr>
<td>10:10 a.m.</td>
<td>1:10 p.m.</td>
</tr>
<tr>
<td>12:25 p.m.</td>
<td>4:25 p.m.</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>10:30 p.m.</td>
</tr>
</tbody>
</table>

On Monday, Tuesday, Wednesday, and Thursday the hours of 4:25 to 7:30 p.m.; on Friday the hours after 4:25 p.m.; on Saturday the hours after 12:05 p.m.; and all day Sunday are free from all formal undergraduate class or laboratory exercises.

Evening classes are held only on Monday and Wednesday and only when regularly scheduled and included in written college announcements or when recommended by the Committee on Academic Records and Instruction. Evening lectures, recitations, and similar exercises start at 7:30 and 8:35 p.m.; evening laboratories and similar exercises start at 7:30 p.m.

Evening preliminary examinations that will be given outside of normal class hours may be scheduled on Tuesday and Thursday evenings only, beginning at 7:30 p.m. All such examinations shall be scheduled with the Examination and Room Coordinator in the Office of the University registrar. The dates and times of these examinations are listed in the Course and Room Roster for each term.

Any exception to the above regulations, other than those for evening preliminary examinations, will require permission of the dean or director of the college or school offering the course. Exceptions to the regulations on evening preliminary examinations require approval of the dean of the faculty. All such exceptions shall include provision of special arrangements for the students for whom conflicts are generated by such an exception.

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. Examinations not listed in the registrar's examination schedule will be arranged by the professor in charge and must fall within the announced examination period, except by the express permission of the dean of the faculty in accordance with existing faculty legislation.

Audiaking 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 admittance 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 in 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

Guide to Course Listings

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
- Chemical 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.
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 denotes 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 attached. These are the quality-point equivalents:

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

This is how a term average is computed:

<table>
<thead>
<tr>
<th>Course</th>
<th>Grade</th>
<th>Quality Points</th>
<th>Credits</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>103</td>
<td>B+</td>
<td>3.0</td>
<td>9.9</td>
</tr>
<tr>
<td>English</td>
<td>151</td>
<td>C</td>
<td>1.7</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>
</tbody>
</table>

Total: 16/42.0

To arrive at the term average, add the products (credits x 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.

Official Transcripts

An official transcript is one that bears the official seal of the University and the signature of the University registrar. 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 other 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, 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 1985–86

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 (1985)

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 $40 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 around 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 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, or have a degree conferred. If students' bills show a previous unpaid balance, they must arrange for payment by August 17 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
Accident and Sickness Insurance

The accident and sickness insurance charge on the August billing statement is for insurance for hospitalization, surgical fees, and major medical coverage for the period of August 27, 1985 through August 27, 1986. The cost of this insurance is lower than the average cost of comparable coverage under other group accident and health insurance policies. A brochure is included with the August bill.

For those who do not want medical insurance coverage, a medical insurance waiver form (included with the tuition statement mailed in mid-July) must be completed and returned no later than August 28, 1985. Waivers cannot be processed after this date. If a waiver form is lost or destroyed, a replacement can be obtained by contacting the Gannett Health Center (telephone: 607/256-6363).

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 $12. Itemized monthly statements, which are mailed to students, must be paid by the due date on the statement, or finance charges of 1 1/2 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: 607/256-6324). 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 1/2 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, 1985-86 as a guide. Brochures are also available describing 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.

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: S. C. Johnson Graduate School of Management, Office of Admissions and Student Affairs, Cornell University, 315 Malott Hall, Ithaca, New York 14853-4201 (607/256-7248).
- College of Veterinary Medicine: New York State College of Veterinary Medicine, Cornell University, Ithaca, New York 14853-6201 (607/256-4844).
- 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.

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 absentia 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.
Application

Applications for undergraduates for the 1986–87 academic year will be available from the Office of Financial Aid in December 1985. Undergraduates are required to reapply for financial aid annually and must submit applications by April 1, 1986.

Non-University Financial 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 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 authorizes a deferred complete semester's tuition charged in the amount of the scholarships. When checks are received, they are credited against outstanding tuition balances.

Other scholarships from sources outside the University are considered part of the financial aid award. With the exception of state and federal grants and faculty tuition benefits, the first $500 of any outside scholarship will be used to reduce expected self-help (loan or work). Fifty percent of the remaining amount will also be used to reduce self-help until the self-help minimum is reached, while the remaining fifty percent will reduce University scholarship aid. Once the self-help minimum is reached, all scholarships in this category will reduce University grants.

Scholarships from sources outside the University are credited to the student’s initial bill from the bursar if checks are received prior to the date the bill is prepared. Checks received after the initial billing will be applied towards unpaid charges. Any finance charges caused by the late receipt of checks for outside scholarships will be the student's responsibility. It is important, therefore, that the student arrange with any outside scholarship donors to have checks mailed to the University Office of Financial Aid as promptly as possible. If all University charges have been paid at the time the outside scholarship is deposited, a refund check will be issued to the student. These checks may be picked up in 260 Day Hall.

Undergraduate students receiving aid from the University are required to report receipt of any outside scholarship resources to the Office of Financial Aid.

The New York State Tuition Assistance Program (TAP) is for students who are New York State residents and whose New York State net taxable income for 1984 was $29,000 or less. Students from families with higher incomes may qualify for an award if more than one child is in college. TAP awards range from $150 to $1,350 per semester. Students must apply annually for awards by completing a TAP application and mailing it to the New York State Higher Education Services Corporation (NYHESC). An award certificate is sent by NYHESC to inform applicants of their award eligibility. A copy of the award certificate must be submitted by the student to the Office of the Bursar before credit can be claimed. In disbursing awards to students' accounts, the University is responsible for certifying the amount of tuition due and that each recipient is enrolled full-time in an approved program and is in good academic standing. The definitions of each of these terms are as follows:

Enrolled full-time: registered for 12 credits or more per semester.

Good academic standing:
1) Pursuit of program: Freshmen are required to complete a minimum of 6 credits per semester; sophomores, 12 credits per semester; and juniors and seniors, 18 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 administered 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 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 financial 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 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 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 $1,408 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 233 Day Hall. Parents are welcome, though it is suggested that appointments be verified prior to visiting the campus. Peer advisers 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:

College Work-Study Program
non-work-study job opportunities
the Cornell Tradition resolution of employee-employer conflicts
information regarding the student employee job classification and wage-scale system
off-campus job opportunities

Information regarding job postings, programs, and application deadlines is available through the SEO, CUNFO, Scoop Sheet (a monthly newsletter for students who work) and “Student Employment Notes” (a weekly 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. Cail, dean
Kenneth E. Wing, associate dean
George J. Conneman, director of instruction
Helen L. Wardeberg, associate director of instruction
Norman R. Scott, director of research
Lamartine E. Hood, director of the New York State Agricultural Experiment Station (Geneva)
Brian F. Chabot, associate director of research
James J. Zuiches, associate director of research
Lucinda A. Noble, director of cooperative extension
David T. Smith, associate director of cooperative extension
Edwin B. Oyer, director of international agriculture

Office of Instruction Staff

Student services: Donald Burgett, Cathy Thompson
Records: Tom Wakula
Registrar: Ruth Stanton
Scheduling: Cathy Place
Admissions: Richard Church, Mary Grainger, Nancy Rehkugler, Jennifer Battle
Career development: William Alberts
Special projects: Eunice Paddio-Johnson

Department Chairmen

Agricultural economics: R. J. Kaiter, Warren Hall
Agricultural engineering: G. E. Rehkugler, Riley-Robb Hall
Agronomy: R. F. Lucey, Emerson Hall
Animal science: J. M. Elliot, Morrison Hall
Communication arts: D. F. Schwartz, Roberts Hall
Education: J. P. Bail, Roberts Hall
Entomology: M. J. Tauber, Academic II
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: G. H. Obery, Plant Science Building
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. Planking 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 Harvard 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, cooperative extension, and international agriculture. The offices of the director of instruction and the college registrar are in 192 Roberts Hall. In the Admissions Office in 195. Information about career planning, placement, 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 Alfalfa Room, and many of the college classrooms are in Warren Hall. Public computer facilities are available in 150 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. Conneman, Roberts Hall
Agricultural Economics, R. Boisvert, Warren Hall
Agricultural Engineering, L. Albright, Riley-Robb Hall
Agronomy, J. Duxbury, Bradfield Hall
Animal Breeding, L. Van Vleck, Morrison Hall
Animal Science, H. Hintz, Morrison Hall
*Biochemistry, Molecular and Cell Biology: P. Hinkle, Hall
*Botany, A. Jagendorf, Plant Science Building
Communication Arts (M.P.S. (C.A.)), R. Osman, 640 Stewart Avenue
Development Sociology: F. Buttel, Warren Hall
*Ecology and Evolutionary Biology: P. Marks, Corson Hall
Education (also M.A.T.), R. Bruce, Roberts Hall
Entomology, W. Tingey, Oid Insectary
Environmental Toxicology, S. Bloom, Rice Hall
Floriculture and Ornamental Horticulture, R. Langhans, Plant Science Building
Food Science and Technology, W. Jordan, Stocking Hall
Genetics, A. Blazock, Emerson Hall
International Agricultural and Rural Development (M.P.S. (Agr.)), E. Oyer, Roberts Hall
Landscape Architecture (M.L.A.), L. Minir, E. Sibley Hall
Microbiology, R. Mortlock, Stocking Hall
Natural Resources, W. Youngs, Fenow Hall
*Neurobiology and Behavior, H. Howland, Seeley Mudd Hall
Nutrition, L. Wright, Savage Hall
*Physiology, D. Tapper, Veterinary Research Tower
Plant Breeding and Biometry, P. Plaisted, Emerson Hall
Plant Pathology, M. Zaitlin, Plant Science Building
Plant Protection (M.P.S. (Agr.)), P. Amrose, 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. Faculty coordinators are listed for each area. Students should consult with the faculty coordinator regarding requirements and opportunities for concentrations within the major field of study.

Agricultural Economics: D. Goodrich, 254 Warren Hall
Agricultural Engineering: G. Rehkugler, 104 Riley-Robb Hall
Agronomy and Meteorology: G. Fick, 505 Bradford Hall
Animal Sciences: J. Polak, B-22 Morrison Hall
Biological Sciences, Division of: H. Stinson, 200 Statman Hall
Communication Arts: D. Schwartz, 307 Roberts Hall
Education: G. Poiner, Roberts Hall
Entomology, E. Fraifenzperger, Academic II
Food Science: F. Shipin, 118-C Academic II
Landscape Architecture: M. Adleman, 230 E. Roberts Hall
Microbiology: P. VanDemark, 413 Stocking Hall
Natural Resources: H. Barlow, 204F Fenow Hall
Plant Science Departments (Breeding, Floriculture, Pathology, Pomology, Vegetable Crops): J. Lorbeer, 424 Plant Science Building
Rural Sociology: J. Frances, 332 Warren Hall
Statistics and Biometry: C. McCulloch, 338 Warren Hall
Special Agricultural Studies (ALS): G. Conneman, 192 Roberts 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

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 the University requirement for two terms of work (see p. 23)
   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 (256-4286).

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 the 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 scholarly study and research in
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. A majority 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. Procedures are available in the Admissions Office of the College of Agriculture and Life Sciences, 195 Robert H.avl. The procedure includes filing 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 and degree requirements, if the index score is 30 or above, and transfer any credit to the physical sciences requirement, if the placement score is below 13.

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 resume 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 (telephone: 256-2036).

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 (telephone: 256-4987).

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. Forms 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.

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 about 15 percent come from other parts of the United States or abroad. Nearly half of the undergraduates are women. About 11 percent are identified as members of minority-ethnic groups.
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.

Record of Academic Standing

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.

Academic Standing

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 headmistress 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.

Petitioning

A student who has grounds to be exempt from a college academic regulation may submit a petition to the committee on a form available in the Office of Student Services, 192 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.

Academic Procedures and Policies

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

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 filed 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 file 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 R 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 the 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/Change
Students may add courses during the first three weeks of the term and may drop courses until the end of the sixth week 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 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
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 are failing 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, deeming that they may not register, 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 satisfied the committee on 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 attained a cumulative 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.

An honors program is offered in seven subject areas. Students in the College of Agriculture and Life Sciences wishing to participate in the honors program must be accepted in one of those seven program areas.

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. Quaaq

Completion of the honors program in animal sciences requires the student to write 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 project 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
Faculty committee: R. Corradino (animal physiology and anatomy), R. MacIntyre (genetics and development), E. Adkins Regan (neurobiology and behavior), J. Roberts (biochemistry, molecular and cell biology), H. Strickson (associate director), ex officio, R. Turgeon (plant biology).

Students will report on their research projects in seminars and in an honors thesis, which will be evaluated both by the committee and by two other faculty members. The students working in each section of the division will meet as a group during each semester together with the appropriate faculty member or members from the committee. These seminars must be attended by all students in the honors program.

Active participation in terms of questions or comments is expected.

The thesis should be written in the form of a research report in a leading journal in the disciplinary area of research. Unless there are unusual circumstances, the thesis should not exceed twenty pages, double-spaced. The student, with guidance of the research supervisor, conducts a thorough literature search on the topic.

Three copies of the thesis need to be submitted to the honors committee by the designated date. The faculty research supervisor must submit an evaluation of the thesis, including judgments on the significance of the problem and of the thesis. The thesis is also reviewed by two anonymous faculty members. A majority vote of the honors committee that the thesis is acceptable is necessary for the recommendation that the student be graduated with honors.

Entomology
Faculty committee: B. L. Peckarsky, chairman; W. L. Brown, Jr., 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 topics such as systematics, insect behavior, phylogenies 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 on an honors project proceed with the following steps:

- Discuss the matter with his or her academic adviser, preferably in the beginning of the semester. A research proposal 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 first semester of the senior year. Earlier submission is encouraged.
- Submit a brief progress report, approved by the project supervisor, to the entomology honors committee by mid-term 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 Juggalae 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. The 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

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 member 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 who may be investigating similar subjects.
- Describe and summarize 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.
- Work closely 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.

Physical Sciences
Faculty committee: W. F. Shipe, chairman; D. A. Halbrack, J. D. 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. Oenendorf, C. Wein, 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 chairman 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. Aspin, H. Capener, N. Awe.

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 one of the fields in the behavioral and social sciences. Both the results of the research and the methodology of the research must be achieved to be reported. Reviews of literature, practical conclusions or applications, 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 that 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 report should 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.

Students who have been accepted in the College of Veterinary Medicine may double-register in their seventh, eighth semesters, and complete requirements for the Bachelor of Science degree in the College of Agriculture and Life Sciences. Students should consult with the college registrar, 132 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. An advice 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 study. Facilities 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 in the College of Engineering in the junior and senior years. Students pay the Engineering College tuition in the junior year. The curriculum is accredited by the Accreditation Board for Engineering and Technology.

The program in Landscape Architecture is administered by the Department of Horticulture 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 the undergraduate and graduate levels, as well as a graduate second professional degree program.

The Division of Nutritional Sciences is an intercollegiate unit 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 pursue a nutrition emphasis in areas such as animal sciences, poultry and avian sciences, food processing management, food science, microbiology, pomology, and vegetable crops. Students may also pursue a concentration in biological sciences, option 8, or a concentration in general agriculture that includes a minor in horticulture.

The American Indian Program (AIP) is a multidisciplinary intercollegiate program with instructional, research, and extension components. The instructional core consists of courses focusing on American Indian life with an emphasis on the Iroquois and other Indians of the Northeast. A description of the program is given on pp. 212–213. For more information, students should contact Raymond Fougnier, director, American Indian Program, Caldwell Hall (phone: 256-6587).

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 at one of the listings below for courses. Tuition is prorated for off-campus study. In some cases stipends are provided to help defray living expenses. Students receiving financial aid should consult with the Office of Financial Aid prior to leaving campus and should be sure that accounts have been cleared with the bursar in order to receive credit.

Students who plan to enroll in courses at another institution in the United States or abroad, including those participating in the exchange program, petition to register for study in absentia. The petition form is available in 17 Roberts Hall. The course of study that will be undertaken should be planned in consultation with the adviser to assure that the student is appropriate to the student's academic program. Approval of petition by the Committee on Academic Achievement and Petitions guarantees acceptance of transfer credit as long as the grades received are equivalent to C or better. A maximum of 15 credits per term may be transferred for study in absentia.

Albany Programs

Three programs in the New York State capital relate career interests to academic and legislative concerns. The Assembly Intern Program provides a placement as a member or staff intern for the state legislature. 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. While in Albany, students receive an intensive orientation to state government and attend a lecture-seminar program.
composed of three 2-credit components, offered by each program's professor-in-residence. Applicants are screened by the A&L Internship Committee in the term prior to assignments. Those accepted should plan a program of study in consultation with their faculty adviser during the planning year. Students 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 Cornell faculty member in an appropriate discipline.

To receive academic credit for the internship experience, students enroll in ALS 400, Internship, for a maximum of 6 credits, S-U grades only. General supervision of the internship is provided by the Internship Committee.

Independent study and research courses offered by the various departments in A&L and/or courses offered by academic institutions in the Albany area may be elected to complete a full course of study for the term. None of the credits earned in the Albany program may be used to meet distribution requirements; at least 12 credits must be carried to meet the residence requirement. Students should note that the last-term average must be 1.7 or above. Normally a faculty member will not sponsor more than one of the independent study courses for any one student.

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

Cornell-in-Washington

Students apply for the Cornell-in-Washington program through the Department of Government, 134 McGraw Hall. A&L students admitted to the program should fill in the off-campus study form and preenroll for courses to be taken while off campus. Approval of one's academic faculty adviser must be secured when preenrolling for courses to assure that the courses are appropriate for the degree program being pursued. Courses and seminars in the Cornell-in-Washington program that carry college credits are taught in agricultural economics and communication arts.

Internships

Several departments in the college offer supervised internships 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. A maximum of 15 credits of the 120 required for the degree may be taken in internships and/or independent study courses.

The College of Agriculture and Life Sciences does not offer a field study option.

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 the Office of Student Services, 17 Roberts Hall, for information and application blanks.

Several opportunities for study abroad are coordinated with the College of Agriculture and Life Sciences. These opportunities offer students a broadened educational program, a multiculural perspective, and possible new avenues of career development. Among the available study-abroad programs are two student exchange programs with universities in Mexico and Sweden, Cooperative arrangements with the University of Reading, in England, and the University of Dublin, in Ireland. Students may be encouraged to endorse several students for a year of study under a tutor in those schools.

Students in the exchange programs must petition for registration in absentia. Credit received for academic work at any of these schools may then be transferred to meet requirements for graduation at Cornell in the normal time period.

Mexican exchange program. Two students from the college are competitively selected in the freshman year to go to the Instituto Tecnologico y de Estudios Superiores de Monterrey during the junior year. The sophomore year is used to attain proficiency in the Spanish language. Students attend Instituto Tecnologico y de Monterrey and Cornell University under similar arrangements each year.

Swedish exchange program. The student selected to participate in the Swedish exchange program applies for it in the sophomore year and spends the junior year at the Agricultural College of Sweden 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 the Agricultural College in Uppsala spends a year at Cornell University.

Year abroad in England. The college has an arrangement with the University of Reading whereby a few students are recommended to the faculty for admission for one year as occasional students. Students go in their junior year. All expenses are paid by the student, but total costs (including transportation) have been less than at Cornell.

Year abroad in Ireland. Cornell students with majors in the biological sciences or related areas, a special year-abroad program has been established with the University of Dublin (Trinity College), in Ireland. A small number of Cornell students in genetics, microbiology, and biochemistry participate in the program each year. The program is similar to the Reading program with respect to finances.

Major Fields of Study

The college curriculum emphasizes the biological and physical sciences and the technology basic to the study of agriculture and life sciences. The sixteen major program areas reflect the departmental academic effort in the college. Faculty committee members in each area identify a core and sequence of courses appropriate for all students studying in that field. Courses of study are designed to provide systematic development of basic skills and concepts. Opportunity for specialization 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 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, waste 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 student must be highly motivated and have a strong aptitude for mathematics and physical sciences. Biological, social, and agricultural sciences are integrated in this specialization, but the physical sciences predominate. The specialization is jointly sponsored 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 animal science as well as in plant physiology, food science, genetics, and microbiology. The emphasis is on technical aspects of the production of food, feed, and fiber.

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

1. Mathematics, including one semester of calculus 6
2. Chemistry 6
3. Physical sciences
   a) Physics (if no previous high school physics) 8
   b) Application of physical sciences in agricultural engineering 6
3. Oral communication 3
5. Technical skills
   a) Computer programming 3
   b) Graphics 3
   c) Surveying 3
   d) Metal work or carpentry 2

B. Advanced and Applied Subjects

1. Agricultural sciences
   a) Soils 4
   b) Animal production 3
   c) Plant production 3
   d) Farm 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 towards 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 design.

Specific course requirements for environmental technology are:
A. Basic Subjects

1. Calculus (Math 111, 112, and if additional work is proposed, Math 214, 215, 216, 218) 6-10
2. Chemistry 6-8
3. Physics 8
4. Computer programming 3
5. Microeconomics 3
6. Introductory environmental sciences
   a) Soil science 4
   b) Natural resources 3
   c) Microbiology 3
d) Ecology 3

B. Advanced and Applied Subjects

1. Physical sciences
   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 and Meteorology

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

Crop science is the application of basic biological and ecological knowledge to the production and management of field crops. Examples of field crops are alfalfa, corn, soybeans, and wheat. Courses required by all students who specialize in crop science include general biology, botany, plant physiology, general chemistry, mathematics, computing, crops, and soils. 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, economics, 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 in this specialization 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 agronomic 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, botany, chemistry, 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 a specialization within agronomy, shared among a number of departments. Students may also specialize in departmental programs in general plant science, plant protection, or general agriculture.

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 advisors. 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 following graduation. 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 records warrant it 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 choose specializations and options. Courses in agricultural economics are supplemented with others in related areas such as computer science, economics, sociology, history, government, industry, business administration, consumer economics, animal sciences, plant sciences, natural resources, mathematics, and statistics.

Students with outstanding academic records may apply to corregisite in the Johnson Graduate School of Management—Students interested should contact the Admissions Office, 315 Maltz 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, or (2) prepare for graduate work in agricultural economics.

Business management and marketing apply 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 a broad study of the nature and practices of business institutions. Market analysis, sales, banking, merchandising, and production management are fields for which students may prepare.

Farm business management and finance is intended for students with farm experience who are interested in farming or in preparing for work in farm management or farm finance, in cooperative extension, and in farm cooperatives.

Food-industry management is designed for students interested in management or sales positions with the processing, manufacturing, or distribution segments of the food industry.

Resource economics is an option for students interested in the application of the principles of economics to problems, both public and private, involving natural and human resources. Public affairs management integrates a range of subject areas designed to familiarize students with the nature of public affairs and managerial complexities created by the interaction of economic factors in social and political institutions.

The program includes core courses in the Department of Agricultural Economics and additional courses in an optional area of concentration. The following core courses are generally required in all specializations in applied economics and business management:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 150</td>
<td>Economics of Agricultural Geography</td>
<td>3</td>
</tr>
<tr>
<td>Ag Ec 220</td>
<td>Introduction to Business Management</td>
<td>3</td>
</tr>
<tr>
<td>Ag Ec 221</td>
<td>Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Ag Ec 620</td>
<td>Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Ag Ec 310</td>
<td>Introductory Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

Biological Sciences

The program in 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, systemsatics, and evolution; genetics and development; neurobiology and behavior; and an independent option. Programs of study are described under the Division of Biological Sciences.

Communication Arts

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 comprehend the social psychology of human communication. Students in the Department of Communication Arts have the opportunity to learn both the social science underlying human communication and the most effective means of expressing written, interpersonal, audio, and visual communication to audiences. The curriculum emphasizes learning communication theory along with communication skills.

Credits

Major Fields of Study 33
Students elect one of three different sequences by the beginning of their junior year: public communication, publication, or interpersonal communication. Each sequence has a required core of courses that includes Writing for the Mass Media, Theories of Human Communication, Introduction to Mass Media, and Oral Communication.

Public communication prepares students for careers as communication, information, or public relations specialists in a wide variety of organizations. Required courses for this sequence include communication planning and strategy, survey research, communication in organizations, and visual communication. There is heavy emphasis on developing writing skills.

Publication provides an excellent background for working as an editor or writer in virtually any organization. Such positions might include preparing annual reports, writing a newsletter, editing an employee newspaper, writing sales or marketing literature, or writing news stories. Required courses for this sequence are taken in writing, media law, publication design, and communication theory. Students serve as staff members for the Cornell Courier for one or two terms.

Interpersonal communication coupled with a carefully designed concentration prepares students for careers in human services, public service professions, such as personnel administrator, training, and sales and consulting positions. The sequence also may be used to prepare for graduate study in communication and other social sciences. Required courses are taken in communication theory, survey research, and writing. Electives include such courses as small group communication, listening, persuasion, intercultural communication, and organizational communication.

In addition to the requirements for a sequence, a concentration of at least 12 credits outside the department is required. The concentration helps orient students to a communication career in either a business, government, education, or public service organization or to a very specific profession such as agribusiness public relations or science journalism.

Students are strongly encouraged to seek practical communication experience through part-time or summer employment, the department's internship course, or the campus media. Work experience contributes to a portfolio of professional materials that is invaluable in obtaining a position in communication.

Detailed descriptions of the sequences and the guidelines for the selection of elective courses are available from the Department of Communication Arts, 307 Roberts Hall.

**Education**

The focus in the Department of Education is on how teachers prepare for teaching take place in school and nonschool settings as well as on the role of education in our society. Students study concepts and develop competencies necessary to analyze educational situations critically and to plan, implement, and evaluate educational programs. Students specializing in the program area take a core curriculum: 1) A course in general psychology (e.g., Education 110), 2) A course in educational psychology (e.g., Education 211), 3) A course in the social historical and philosophical foundations of education (e.g., Education 370, 472), 4) A field experience (e.g., Education 420, 430). Two specializations are available at the undergraduate level.

*Agricultural education.* This specialization leads to teaching agriculture in secondary schools and two-year colleges, positions in extension education, and education in the agricultural industry. It is intended for students who have good academic ability, experience in agriculture, and an interest in youth and young adults who would like to study agriculture. The ability to work with people is essential.

Certification is required to teach in public secondary schools. Agricultural certification areas are agricultural education, conservation, farm production and management, horse handling and care, ornamental horticulture, and small-animal care. Provisional certification, good for five years, may be earned by completion of an approved core curriculum, including a student teaching experience, leading to the baccalaureate degree. A passing grade on a state teacher's test is also required. Permanent certification requires a master's degree. Persons with a bachelor's 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, Stone Hall (telephone: 256-2197).

**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 to 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 specializations in 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, Stone Hall (telephone: 256-6524).

**Entomology**

The intent of this specialization 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 in this specialization pursue graduate studies 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
- A course in physics
- Chemistry 103—104 or 207—208
- Chemistry 253 (organic)

**General Biology**

- Introductory biology
- Biological Sciences 330 or 331, Principles of Biochemistry
- Biological Sciences 331, 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**

- 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 677, 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 include 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, and introductory statistics. Students may choose additional courses in chemistry, 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 and management; 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 exotic 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, planting design, 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 land areas 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 and an approved summer internship.

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 three 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 the Denmark International Study Program in lieu of a semester at Cornell.

First Year

<table>
<thead>
<tr>
<th>Credits</th>
<th>Fall Term</th>
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<tbody>
<tr>
<td>1</td>
<td>LA 100, Landscape Architecture</td>
</tr>
<tr>
<td>3</td>
<td>Freshman Orientation</td>
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<tr>
<td>3</td>
<td>*Flr 109, Nature Drawing</td>
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<tr>
<td>3</td>
<td>Biological sciences elective</td>
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<td>3</td>
<td>Physical sciences elective</td>
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<td>3</td>
<td>Social sciences or humanities elective</td>
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<tr>
<td>3</td>
<td>Written or oral expression elective</td>
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<td>16</td>
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<tr>
<th>Credits</th>
<th>Spring Term</th>
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<tbody>
<tr>
<td>4</td>
<td>LA 140, Landscape Design Studio</td>
</tr>
<tr>
<td>3</td>
<td>LA 224, Plants and Design</td>
</tr>
<tr>
<td>3</td>
<td>Biological sciences elective</td>
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<tr>
<td>3</td>
<td>Social sciences or humanities elective</td>
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<tr>
<td>3</td>
<td>Written or oral expression elective</td>
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<td>16</td>
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Second Year

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<tr>
<th>Credits</th>
<th>Fall Term</th>
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<tbody>
<tr>
<td>3</td>
<td>LA 220, Principles of Spatial Design</td>
</tr>
<tr>
<td>6</td>
<td>*LA 201, Theory and Application Studio</td>
</tr>
<tr>
<td>3</td>
<td>LA 205, Graphic Communication I</td>
</tr>
<tr>
<td>3</td>
<td>Physical sciences elective</td>
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<td>15</td>
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<tr>
<th>Credits</th>
<th>Spring Term</th>
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<tbody>
<tr>
<td>6</td>
<td>*LA 202, Project Design and Site-Planning Studio</td>
</tr>
<tr>
<td>3</td>
<td>LA 206, Graphic Communication II</td>
</tr>
<tr>
<td>4</td>
<td>LA 310, Site Construction I</td>
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<tr>
<td>3</td>
<td>Physical sciences elective</td>
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<td>16</td>
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Third Year

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<thead>
<tr>
<th>Credits</th>
<th>Fall Term</th>
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<tbody>
<tr>
<td>6</td>
<td>LA 301, Natural Systems Studio</td>
</tr>
<tr>
<td>4</td>
<td>LA 311, Site Construction II</td>
</tr>
<tr>
<td>3</td>
<td>LA 521, History of Landscape Architecture I</td>
</tr>
<tr>
<td>3</td>
<td>*Flr 313, Woody Plant Materials for Landscape Use</td>
</tr>
<tr>
<td>3</td>
<td>Free elective</td>
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<td>15</td>
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<tr>
<th>Credits</th>
<th>Spring Term</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>LA 302, Urban Systems Studio</td>
</tr>
<tr>
<td>3</td>
<td>LA 522, History of Landscape Architecture II</td>
</tr>
<tr>
<td>3</td>
<td>Written or oral expression elective</td>
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<tr>
<td>3</td>
<td>Free elective</td>
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<tr>
<td>15</td>
<td>(Optional landscape architecture study abroad semester in Denmark)</td>
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Fourth Year

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<tr>
<th>Credits</th>
<th>Fall Term</th>
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<tbody>
<tr>
<td>2</td>
<td>LA 400, Senior Project Seminar</td>
</tr>
<tr>
<td>6</td>
<td>LA 401, Advanced Project Design Studio</td>
</tr>
<tr>
<td>6</td>
<td>LA 520, Contemporary Issues in Landscape Architecture</td>
</tr>
<tr>
<td>3</td>
<td>Ag Ec 320, Business Law</td>
</tr>
<tr>
<td>3</td>
<td>Biological sciences elective</td>
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<td>16</td>
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<table>
<thead>
<tr>
<th>Credits</th>
<th>Spring Term</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>*LA 402, Senior Project</td>
</tr>
<tr>
<td>3</td>
<td>Social sciences or humanities elective</td>
</tr>
<tr>
<td>3</td>
<td>Free elective</td>
</tr>
<tr>
<td>3</td>
<td>Free elective</td>
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<td>15</td>
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<table>
<thead>
<tr>
<th>Credits</th>
<th>Summary of credit requirements</th>
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<tbody>
<tr>
<td>80</td>
<td>Specialization requirements</td>
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<tr>
<td>36</td>
<td>Distribution electives</td>
</tr>
<tr>
<td>9</td>
<td>Free electives</td>
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<td>25</td>
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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.

Second professional degree curriculum. The two-year Master of Landscape Architecture (M.L.A.) curriculum, accredited by the American Society of Landscape Architects, serves to broaden and enrich undergraduate education in design by providing an expanded educational experience to those who are technically skilled. Applicants are therefore expected to hold a bachelor's degree in landscape architecture or architecture from an accredited program.

The objectives of the two-year M.L.A. curriculum are to permit students to conduct research relating to landscape architecture and to provide advanced education and training to individuals who wish to teach, practice, or conduct applied research in landscape architecture. Students are permitted considerable flexibility in establishing programs that take full advantage of the teaching and research resources of the University.

Students admitted to the two-year M.L.A. curriculum are required to complete 60 credits of course work as approved by the members of their graduate committee. This must include at least two advanced studio seminars, a graduate seminar, and a thesis or final master's project.
Microbiology

Microbiologists study microbes such as bacteria, viruses, rickettsiae, mycoplasma, fungi, algae, and protozoa. Some of these organisms cause diseases, but many contribute to the balance of nature and 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, 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 teaching, and they may prepare for career 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, laboratories, and industries.

To provide a firm background in basic sciences, 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 teaching, and they may prepare for career 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, laboratories, and industries.

Natural Resources

This undergraduate curriculum is designed to provide an enduring and broadly applicable education. It is based on the premise that the core curriculum is intended for students whose interests lie in several biological and environmental sciences. More information may be obtained from the Department of Microbiology, Stocking Hall.

Undergraduates are encouraged to obtain practical experience. This may involve research under the direction of a faculty member, supervised work on the university’s commercial industry or research institute or on a farm. Departments will assist students looking for positions that would provide useful experience.

Fioriculture and ornamental horticulture applies principles of plant science and business management to floriculture and landscape horticulture careers. Projects include turfgrass crops, as well as to the selection and management of plants for both indoor and outdoor landscapes. Programs prepare students for careers at the professional and managerial levels in horticultural business, research, design, consulting, and extension and public education.

Students must complete the core curriculum consisting of the following:

1. For 100, Introduction to Fioriculture and Ornamental Horticulture
2. For 213, Woody Plant Materials
3. Flor 312, Garden and Interior Plants I
4. Flor 401, Principles of Plant Propagation
7. Agron 260, Uses and Properties of Soils
8. Entom 241, Applied Entomology, or Entom 212, Insect Biology
9. Pi Pa 301, Introductory Plant Pathology

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

With permission of their adviser, transfer students may receive credit for similar courses taken at other institutions provided that transfer credit is granted by the college. Additionally, transfer students must complete a minimum of 12 credits in floriculture and ornamental horticulture courses 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 224, LA 310, or LA 311. Freehand drawing courses may not be applied to this requirement.

Students are also asked to select an area of emphasis in floriculture and ornamental horticulture or landscape architecture. Requirements for specialization may be found in the beginning of their junior year. Specialization in floriculture prepares a student for a career in greenhouse florist crop production management and wholesale and retail florist marketing, whereas specialization in landscape architecture trains one for careers in nursery-crop production, 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, teaching, research, extension and public education, and communications may be chosen in any institution of the student's choice.

Numerous opportunities to become familiar with the humanities and in other areas of special interest to the student are encouraged and provide opportunities for broadening and enriching learning experiences.

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

- Agricultural economics
- Business management
- Agricultural engineering
- Economics
- Sociology
- Politics
- Government
- History
- Anthropology
- Art
- Anthropology
- Archaeology
- History
- Sociology
- Politics
- Government
- Economics
- Sociology
- Politics
- Government
- History
- Anthropology
- Art

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 19131  Street NW, Washington, D.C. 20006.
horicultural industries and professions are provided through field trips, guest lecturers, and optional special topics and work experience programs. Questions concerning the undergraduate curriculum, advising, and related matters should be addressed to the Undergraduate Coordinator, Department of Floriculture and Ornamental Horticulture, 20 Plant Science Building, Ithaca, New York 14853-5906 (telephone: 607/256-3137).

The department's office is 20 Plant Science Building. Departmental facilities include classrooms and laboratories, a greenhouse, field laboratories, and the Kenneth Post Laboratory, the Turfgrass Research Field Laboratory, landscape architecture studios in East Roberts Hall, and freestanding drawing studios in Mann Library.

Plant biology provides undergraduate preparation for graduate study in the plant sciences involved with basic research as well as 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, plant taxonomy, ecology, and statistics. A core of courses is strongly suggested. These include mathematics, plant biology and physiology, and cytology. However, different specialties within plant biology afford a flexible curriculum.

Plant breeding provides undergraduates with (1) preparation for graduate study leading to advanced degrees in plant breeding and plant genetics; (2) preparation for work in producing and marketing of plant varieties and making varietal recommendations, and for positions in seed analysis, regulation, and quality control.

In cooperation with an adviser, each student plans a curriculum with a concentration in basic sciences supplemented by courses in applied fields best suited to his or her individual goals. Options include plant breeding and plant genetics; genetics, cytology, and cytogenetics; mathematics (calculus) and statistics; organic chemistry and biochemistry; plant anatomy, ecology, and physiology; crop production; and plant pathology and disease control.

Plant pathology requires broad training in the physical and biological sciences plus a general background in the area of crop production with emphasis on 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 biology, field research, 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 management for plant protection. 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 agencies, 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 basis for 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 microbial ecology. Additional courses in introductory entomology, insect pest management, introductory plant pathology, plant disease control, weed science, and pesticide regulation 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 are recommended, depending upon the student's interests: agricultural economics, agricultural engineering, agronomy, biochemistry, communication arts, plant pathology and entomology, general physics, genetics, meteorology, mycology, pesticides in the environment, and plant anatomy. Employment involving 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 the influence of environmental factors on 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 state's 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 and electives in the student's area of interest, prepares the student major for a career in fruit production, agricultural business related to the fruit industry, or storage and merchandising, or as a professional pomologist. Job 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 of study. In New York state more than twenty economically important vegetables are produced and marketed. Vegetable crops have a high value per acre, making it economically feasible to invest relatively large sums in land, equipment, fertilizers, seed, and pesticides. 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 vegetable pathology, 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 a faculty adviser. 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, and marketing; soils, soil fertility, and Ag economics; plant biology, physiology, ecology, and anatomy; oral expression; food sciences; nutritional sciences; plant genetics, statistics, and plant breeding, economic entomology, plant diseases and their control. 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 the social institutions, technologies, environmental 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 the 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 job skills and broad exposure to research that is relevant to employment during 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 its 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 coursework with specialization of their choosing by electing courses in other departments and programs, thereby rounding out their educational objective by acquiring different perspectives.

The undergraduate specializations 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 across these specializations, both in terms of the course requirements and in credit toward graduation (see details below).

Regardless of specialization, 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 (211), or theory (213), and one course in applied research.

The sociology of agriculture and natural resources specialization is intended to provide an understanding of the biological, technological, political, 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 change requires a student to understand the processes of social organization and change, where natural resources play a strategic role in economic production.

Students in the specialization are encouraged to complement courses in the department with coursework in economics, natural resource management, agricultural business, and social sciences. Course selection from the department's other specializations in rural and community (regional) development, social data and policy analysis, and international development makes appropriate complements to the specialization in agriculture and natural resources.
Agriculture and Life Sciences

Total credits required for this specialization, including core courses: 45 Credits

Required Courses for Specialization (in addition to core courses). Credits
R Soc 208, Problems in Agriculture and Natural Resources 3
R Soc 324, Environment and Society 3
R Soc 405, Agriculture, Society, and Biotechnology 3
R Soc 445, Rural Social Stratification 3

Required Electives for Specialization (at least 12 credits to be selected from a list of the complementary courses. Other courses may be substituted for these with the consent of the student's adviser.

The rural and community development specialization provides an understanding of and training in (1) the analysis of social structures and processes for development in nonmetropolitan settings, particularly in the United States; (2) the formulation of strategies for development in these settings; and (3) the implementation of development efforts in diverse communities. The 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 for this specialization, including core courses: 45-48

Courses Required for Specialization (beyond core courses) Credits
R Soc 208, Problems in Rural and Community Development 3
R Soc 213, Social Indicators and Data Management 3
R Soc 356, Rural Society in America 3
R Soc 436, Small Communities: Structure and Change 3
R Soc 438, Community Development 3

Electives for Specialization (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 that (1) fall in the 200–400 levels, and (2) have a large part of their content dealing with social analysis of phenomena occurring in the United States. Other courses may be substituted for these with the approval of the student's adviser. Total credits: 12

The international development sociology specialization provides an understanding of and training in (1) the application of social, economic, political, and historical concepts and principles essential to conducting meaningful analysis of practical problems and issues faced by organizations, communities, regions, and states; (2) in-depth knowledge of research methodology, statistics, and computer applications; (3) knowledge and practice in policy analysis; and (4) procedures for conducting evaluation studies. In addition to acquiring this expertise, the student is expected to accrue substantive knowledge in some area of sociology of his or her choosing.

As in the other specializations, the student is required to take a sequence of courses in rural sociology that introduces him or her to the basic concepts and principles of sociology, research procedures, statistics, and sociological theory. However, this specialization places greater emphasis on the acquisition of research and policy analysis skills than the others. Accordingly, students specializing in this area will take more courses in research methods, policy analysis, and evaluation techniques. Although several of the courses in this sequence will involve statistics and use of computers for collection, tabulation, and interpretation of data, rigorous training in mathematics is not a prerequisite.

Total credits required for this specialization, including core courses: 41-44

Required for Specialization (beyond core courses) Credits
R Soc 201, Sociological Analysis 3
R Soc 301, Evaluating Statistical Evidence 3
R Soc 311, Primary Data Collection and Design or HSS 292, Research Design and Analysis 3
or C Art 382, Survey Research Methods 3
Ag En 102, Introduction to Microcomputer Applications or Ag En 304, Introduction to Computing 3
R Soc/Soc 426, Policy Research 3

Elective Courses for Specialization (11-12 credits) Credits
Econ 102, Introductory Macroeconomics or Ag Ec 150, Economics of Agricultural Geography 3
Soc 414, Policy Analysis or Soc 430, Social Demography 4
Soc 431, Techniques of Demographic Analysis 4

Special Agricultural Studies Programs

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. Such students, in consultation with a faculty adviser, may plan a sequence of courses suited to their individual interests, abilities, and objectives in a specialized field not encompassed by the existing program areas. For example, undergraduates in the College of Agriculture and Life Sciences can develop a nutritional sciences concentration or an approved sequence of courses from the Biology and Society curriculum. However, undergraduates who major in nutrition are admitted to the College of Human Ecology, and Biology and Society majors are admitted to the College of Arts and Sciences. A course of study for a special program must be planned with and approved by a college faculty adviser. Information on these options and names of faculty advisers prepared to advise in special programs are available in the Office of Student Affairs, 17 Roberts Hall.

General agriculture. General agriculture includes production agriculture as well as technical courses in the agricultural sciences. The minimum distribution requirements for general agriculture are those required of all students in the college. Students, in consultation with a faculty adviser, select a series of agricultural electives represented in most of the departments in the college. Advanced courses in the basic agricultural and life sciences are included. Students have opportunities to learn about the management of

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.

Courses specifically required are Computer Science 100 (or Agricultural Engineering 304) and 211; Industrial and Labor Relations 301 or 310; Mathematics 191 or 112, 111 or 112, or 152, and 221 or 214-215-218; and Statistics and Biometry 200, 408-409, 416-417, 601-602, and 607. Recommended courses include Agricultural Economics 310; Agricultural Engineering 475; Computer Science 104, 107, 108, and 332; Mathematics 421-422 and 472; Operations Research and Industrial Engineering 320-321 or Agricultural Economics 412; Philosophy 231 or Mathematics 381; Statistics and Biometry 605, 606, and 682; and courses in quantitative methods in various disciplines. Work experience gained through summer employment or undergraduate teaching is highly recommended. Students should contact Professor W. Federer for information (telephone: 256-5488).

Brochures describing each of these specializations in more detail are available from rural sociology faculty members.
biological systems for economic development and the benefit of humanity. Students completing this major are often planning a career in agriculture on a farm or related agency. Specializations in cooperative extension and international agriculture offer related career opportunities.

Cooperative extension prepares students for careers in agricultural production, 4-H youth development, community action, and homes and grounds improvement. With the help of designated advisers, courses selected will meet requirements for (1) 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 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. Latwill
Forestry and ornamental horticulture G. Good
Pomology G. Obery
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 and 8 credits in a modern foreign language are required. The other courses recommended are drawn from a wide range of disciplines. The objective is to acquaint students with the many facets of agricultural development in low-income countries. Students are encouraged to take additional specialized courses in one of the other program areas of the college. For additional information, students should contact E. B. Cyer (telephone: 256-2263).

Description of Courses

Undergraduate and graduate courses in the college are offered through the seventeen academic departments and also through the Divisions of Biological Sciences and Nutritional Sciences.

Descriptions of courses, both undergraduate and graduate, are given by department, arranged in alphabetical order.

Graduate study is organized under graduate fields, which generally correlate with the departments. Graduate degree requirements are described in the Announcement of the Graduate School. Courses for graduate students are described in the section on the academic department that offers them.

Nondepartmental Courses-

ALS 027 Introduction to Farm Techniques Fall or spring. No credit. Grade does not appear on transcript. For permission to register, contact C. Place, Schedule of Classes, 100 Roberts Hall.

ALS 100 American Indian Studies: An Introduction Fall. 10 credits. Each student must complete the 15 credits or more in application.

ALS 101 Ethnology of the Northern Iroquois (also Anthropology 316) Spring. 3 credits. Each student must complete the 15 credits or more in application.

ALS 401, fall; 402, spring. Arts and Sciences. 6 credits maximum. Not open to students who have earned internship credits elsewhere or in previous terms. S-U grades only.

D. Schwartz and staff.

Students may register only for internships approved by the College Internship Committee. Currently, the opportunities are available in the New York State Assembly Intern Program, the New York State Senate Assembly Intern Program, and the Albany Semester Program. A learning contract is negotiated between the student and the faculty supervisor, stating conditions of the work assignment, supervision, and reporting. Participation is required in any structured learning activities associated with the internship.

ALS 401-402 American and World Community (also Government 401-402) 401, fall; 402, spring. 3 credits each term.

M W 7:30 p.m. N. E. Awa, R. A. Baer, H. Feldman, J. C. Moi'a, R. J. McNeil, and others.

The theme of work is located in terms of the directions that the concept suggests, with special reference to the role of the United States in translating the concept to reality. The course seeks to examine the American experience against the background of world community from the points of view of the humanities, the social sciences, the natural sciences, and religious studies.
40 Agriculture and Life Sciences

221 Financial Accounting Spring. 3 credits. Not open to freshmen.
Lecs., M W F 10:10 or 11:15; lab, T W R 8—9:55, 10:10—12:05, 12:20—2:15, 2:30—4:25, or W 7—9 p.m.
2 evening prelims. M. Hubbert.
A comprehensive introduction to financial accounting concepts and techniques, intended to provide a basic understanding of the accounting cycle and the elements of financial statement analysis and interpretation.

240 Marketing Spring. 3 credits.
An introductory study of the food marketing system and the society it serves, including the goals and practices of farmers and marketers (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.

250 Introduction to Energy Resources Spring. 3 credits.
Economic analysis of production and demand for petroleum, natural gas, electricity, and solar energy. Investment criteria for energy use systems. Economic advantages and safety problems of nuclear power. Damage and costs of control for acid rain and air pollution. Utility rate regulation. OPEC's world role; developing countries' energy use and environmental problems.

251 Introduction to Energy Resources Spring. 1 credit. Prerequisite: Concurrent enrollment in Agricultural Economics 250.
Disc, F to be arranged. D. Chapman.
Discussion and study of analytical methods and public policy relevant to energy resources. Field trips may be taken.

302 Farm Business Management Spring. 4 credits. Not open to freshmen. This course is a prerequisite for Agricultural Economics 402.
Lecs., M W F 10:10, lab, T W R 1:25—4:25. On days farms are visited, the lab period is 1:25—3:30.
R. A. Milligan.
An intensive study of 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: ALS 115 or equivalent level of algebra.
An introduction to statistical methods. Topics to be covered include the descriptive analysis of data, probability concepts and distributions, estimation and confidence intervals, sampling, 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.
Lecs., M W F 9:05. 1 evening prelim.
J. B. Bughag, D. A. Grossrich.
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, real property, and the landlord-tenant relationship.

321 Law of Business Associations Spring. 2 credits. Limited to juniors, seniors, and graduate students.
Lecs., M W F 11:15, lab, T W R 8—9:55, 10:10—12:05, 12:20—2:15, 2:30—4:25, or W 7—9 p.m.
2 evening prelims. M. Hubbert.
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 control of business organizations. 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. Prerequisites: Agricultural Economics 221 and Economics 102 or equivalents.
An introduction to cost accounting that emphasizes the application of accounting and economic concepts to managerial control and decision making. Major topics include basic costing, standard costing, cost behavior, cost allocation, pricing, budgeting, inventory control, transfer pricing, 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 required by these investments, and how to generate sufficient cash flows to meet the firm's cash obligations. Major topics include methods to analyze capital decisions, impacts of taxes, techniques for handling risk and uncertainty, effects of inflation, sources and costs of debt and equity capital, capital structure, leverage, and working capital management. Microcomputers are used for analyzing financial problems. No previous computer experience is required.

332 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 sectors of the economy. Emphasis on microeconomic analysis of public finance and public choice, with special attention to market failure, articulation of public choice and interests, evaluation of public decisions, and current public policy.

342 Marketing Management Fall. 3 credits. Prerequisites: Agricultural Economics 240 and Economics 101—102.
Deals with principles and practices in the firm's management of the marketing function. Emphasizes the revenue aspects of marketing by considering sales forecasting and strategies in product and brand selection, pricing, promotion, and channel selection, identification and generation of economic data necessary for marketing decisions are considered.

Lecs., T R 10:10; lab, M W R 7—9 p.m.
A review of the structural characteristics of the dairy industry and an analysis of policy issues, pricing systems, and government programs, including marketing orders, price supports, and import policies.

347 Marketing Fruits, Vegetables, and Floriculture Products Fall. 3 credits. Prerequisite: Agricultural Economics 240 or equivalent.
Lecs., T R 8:30—9:55. All-day field trip the last S in September R. B. Howe.
A study of markets, marketing channels, and marketing services for fruits, vegetables, and horticultural commodities. An evaluation of marketing alternatives facing growers, shippers, wholesalers, and retailers of horticultural products. The role of public agencies in market information and regulation. The potential for group action to improve marketing operations.

350 Resource Economics Fall. 3 credits. Prerequisites: Mathematics 111 and Economics 101.
This course develops economic models for renewable resources, exhaustible resources, and environmental quality. Applications to fisheries, forestry, oil and gas, and air and water pollution are presented. Emphasis is on the microeconomic foundations in resource economics and the policy implications for resource management.

351 Farm and Food Policies Fall. 3 credits. S, U grades optional.
Lecs., T R 9:05; disc, R 11:15 or 1:25, or F 10:10; K. L. Robinson.
The course deals broadly with farm and food policies, including price support and storage or reserve policies, agricultural protection, soil conservation programs, the structure of agriculture, and domestic food subsidy programs.

380 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 Business Management Spring. 3 credits. Prerequisite: Agricultural Economics 302 or equivalent.
Emphasis is on evaluating the profitability of alternative investments and enterprises. Principal topics include the effects of income taxes on investment decisions, capital investment analysis, linear programming, and financial risk and uncertainty. Experience in computer applications to farm business management is provided.

405 Farm Finance Fall. 3 credits. Prerequisite: Agricultural Economics 302.
Lecs., T R 11:15; disc, W 1:25—3:20, E. L. LaDue.
The principles and practices used in financing farm businesses, from the perspectives of the farmer and the farm lender. Topics include sources of capital, financing entry into agriculture, financial analysis of a business, capital management, financial statements, credit instruments, loan analysis, financial risk, and leasing.

406 Farm and Rural Real Estate Appraisal Spring. weeks 8—9. 2 credits. Limited to 40 students.
Lecs., T R 11:15; lab, R 1:25—5:30; 5 half-day field trips.
G. J. Conneman.
The basic concepts and principles involved in appraisal. Factors governing the price of farms and rural real estate are used as case studies. Practice in appraising farms and other rural properties.
407 Advanced Agricultural Finance Seminar
Spring. 2 credits. Limited to 16 seniors 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 3:35-4:30. E. L. LaDue.
A special seminar in agricultural finance, conducted with financial support from the Farm Credit System. Includes two days at Farm Credit Banks of Springfield, one week in Farm Credit Association offices, an all-day field trip observing FHA financing during fall term, a four-day trip to financial institutions in New York City during intersession, and lecture-discussions in the spring term. Representatives from banking, agribusiness, finance, and similar areas participate in spring-term lecture-discussion sessions.

408 Seminar in Farm Business Decision Making
Fall (1 week in intersession). 1 credit. Prerequisite: Agricultural Economics 302 and 405 or equivalent, and permission of instructor.
Develops method of analyzing farm business management problems. Gives student experience in identifying alternatives in problem solving. Provides opportunities to analyze and evaluate actual farm situations. Two field trips and intensive work with a farm family.

409 Farm Management Workshop
Fall. 1 credit. Limited to 16 seniors.
T 12-20. 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.

410 Seminar in Farm Business Organization and Estate Planning
Fall (first meeting, last M in September). 1 credit. Prerequisite: Agricultural Economics 405. M 1:25-3:30. R. S. Smith.
Designed for seniors who plan to return to the home farm or to take positions working with commercial farmers in a finance or management capacity. Topics include choice of a business structure for family farm, organizing and operating a family partnership; initiating and managing a commercial farm corporation; financing, tax, and legal problems in starting, operating, and terminating a two-generation family business; estate-planning problems of farm-owning families. Case presentations are informal. Students solve case problems and prepare papers on their home farm or an assigned problem.

411 Financial Markets and Policies
Spring, weeks 1-9. 2 credits. Limited to CALS majors. Prerequisite: Agricultural Economics 405.
Financial markets and policies affecting financial aspects of agriculture and farmers. How money and capital markets affect credit cost and availability in agriculture. Insurance and investment concepts relevant to farm financial decisions. Financial considerations in starting farming.

412 Introduction to Linear Programming
Spring. 3 credits. Primarily for juniors, seniors, and M.S. degree candidates. Prerequisite: Agricultural Economics 310 or equivalent.
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 sensitivity analysis, parameter 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.
An analysis of supply and demand characteristics of farm commodities and food products, temporal and spatial price relationships, price forecasting, and the economic consequences of pricing decisions.

416 Price Analysis
Spring. 3 credits. Prerequisites: Agricultural Economics 310 or equivalent and registration in Agricultural Economics 415.
The course introduces students to basic/econometric principles and the procedures used in empirical studies of demand, supply, and price behavior for agricultural products. Assumptions, properties, and problems encountered in the estimation of the multiple linear regression model are discussed. Applications to agricultural product markets are emphasized. Students are required to specify, estimate, and report on an empirical model.

420 Advanced Business Law
Spring. 3 credits. Limited to juniors, seniors, and graduate students.
Designed to provide a fairly detailed and comprehensive legal background in areas of commercial law dealing with 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. J. B. Bugliari.
Fourteen sessions on the various aspects of estate-planning techniques. The law and use of trusts, the law of wills, federal and New York State estate and gift taxes, and probate procedures are covered.

424 Business Policy
Spring. 3 credits. Limited to seniors majoring in business management and marketing.
An integrating course that examines business policy formulation and execution from the standpoint of the general manager of an organization, focusing on decision making at the policy level. The course is built around a series of cases. Several guest executives. Emphasizes improving oral and written communication skills.

425 Personal Financial Management
Spring. 2 credits. Limited to juniors and seniors.
Lec, M 12:20-2:15; disc to be arranged. Second hour of lec is omitted in weeks discussions are held.
D. A. Grossman.
Managing personal income to maximize financial goals. Topics include personal financial management, investment alternatives, insurance, retail credit, housing, income taxation, and estate planning. Discussions are devoted to problems and case studies in financial planning for students and young families.

426 Cooperative Management
Fall. 3 credits. Recommended: Agricultural Economics 220 or equivalent. Not offered 1985-86.
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 problems. Cooperative systems are a field trip to an agriculture business, 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 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.

443 Food-Industry Management
Spring. 4 credits. Limited to juniors and seniors.
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 operating problems of food retailers and wholesalers. Areas included are site selection, buying, merchandising, personnel administration, private-label products, and financing expansion programs. Leading food-industry specialists frequently join the Thursday session.

448 Food Merchandising
Fall. 3 credits. Limited to juniors and seniors. Prerequisite: Agricultural Economics 240.
Lecs, T R 10-11:15. E. W. McLaughlin.
Merchandising principles and practices 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.

449 Applications in Strategic Marketing
Fall. 2 credits. Prerequisites: Agricultural Economics 342, previous enrollment or concurrent registration, or permission of instructor. Cost of field trips, approximately $225.
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. 19-22, 1986). Grades are not registered until February.
E. McLaughlin.
Focuses on the major components of strategic marketing: product mix, distribution, pricing, advertising and promotion, and market research. Students are given financial exposure to a wide range of marketing strategies through field trips, guest lectures, case studies, 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.
Meets of reaching decisions on environmental questions. Concepts of social value and cost-benefit analysis, determination of degrees of importance of environmental problems, definitions of environmental quality, questions of political economy, and public project and program applications.

452 Land, Real Estate, and Mineral Economics
Spring. 3 credits. Limited to seniors.
The application of economic concepts to the analysis of private and public sector resource management and use issues. Land and mineral markets, the role of land in the economy, mineral valuation, taxation, financing and credit, legal and institutional factors, use planning and restrictions, and public land management will be stressed.

454 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 assignment of the grade. Permission must be attached to course enrollment material. S-U-G grades 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. Not offered 1985–86.

651 Economics of Resource Use Fall. 4 credits. Prerequisite: permission of instructor. Special work on any subject in the field of land economics.

652 Special Problems in Land Economics Fall or spring. 1 or more credits. Limited to graduate students. Prerequisite: permission of instructor. Hours to be arranged. D. J. Allie. Special work on any subject in the field of land economics.

660 Food, Population, and Employment Fall. 5 credits. Enrolment limited to 15 to ensure that students have an opportunity to work individually with instructor. M W 2:30–4: and an individual weekly meeting with the instructor, T. T. Poleman. Examination of agricultural employment, food, and population growth in less-developed countries. Food economics and the world food situation are treated as cornerstone 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 Agriculture Economics 660 or to undertake new ones.

663 Macroeconomic Issues in Agricultural Development Fall. 3 credits. Prerequisite: written permission of instructor. Offered alternate years. Lec to be arranged. E. Thorbecke. Issues such as the role of agriculture in economic development, how to define food 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, 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. 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 644 or work in Latin American economic and social development. Offered alternate years. T R 2:30–4:25. D. K. Freebairn. 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 public-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 that are not covered in regular class offerings. The specific 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. Prerequisite: Agricultural Economics 608, 710, or equivalents. Offered alternate years. Hours to be arranged. R. N. Boisvert. Theoretical and mathematical developments in agricultural economics, with emphasis on estimating microproduction and macroproduction relationships, 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.

711 Econometrics II Fall. 4 credits. Prerequisite: Agricultural Economics 710 or equivalent. Statistics 419 recommended.

712 Quantitative Methods I Fall. 4 credits. Prerequisite: Statistics 416 or equivalent. Recommended: Statistics 417.

713 Quantitative Methods II Spring. 4 credits. Prerequisite: Agricultural Economics 710 or equivalent. Statistics 417 or permission of instructor. Lec, M W F 9:05–9:55; disc, F 12:20–2:15. J. M. Conrad, R. A. Milligan. A study of quantitative methods used to solve dynamic problems. The first half of the course is concerned with dynamic optimization; the second, with simulation.

717 Research Methods in Agricultural Economics Spring. 2 credits. Limited to graduate students. M 1:25–3:20. B. F. Stanton, D. G. Sisler. 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 quantitative methods. Offered alternate years. Not offered 1985–86.

F 1:25–4. D. Blandford, D. G. Sisler. A discussion of selected topics in agricultural trade policy, such as export promotion versus import substitution in developing countries and the role of international commodity agreements. The preparation of a term paper is an important part of the course.
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. Not offered 1985-86.
Develops the concepts and methodology for applying and analyzing the effects of public-policy directives on international commodity models, and macroeconomic models of commodity trade.

741 Methods of Trade and Commodity Policy Analysis
Spring. weeks 8-14, 2 credits. Limited to graduate students. Prerequisite: familiarity with multiple regression techniques on the level of Statistics and Biometry 601. Recommended: Agricultural Economics 640.
The nature, use, and usefulness of alternative quantitative methods of trade and commodity policy analysis. Principal topics are the analysis of export supply-import demand for a single country, international commodity models, and macroeconomic models of commodity trade.

750 Economics of Renewable Resources
Spring. 4 credits. Prerequisites: Economics 509 and 518, or Agricultural Economics 640.
This course focuses on recent developments in mathematical bioeconomics as applied to the management of renewable resources. The theory and methods of dynamic optimization are briefly reviewed. Theory and applied studies in fishery, forestry, and water resource economics are examined along with the role and effectiveness of alternative public policies.

751 Seminar on Agricultural Policy
Spring. 2 credits. Limited to graduate students. Offered alternate years.
A review of the professional literature relating to agricultural policy issues and techniques appropriate to the analysis of such issues.

754 Sociotechnical Aspects of Irrigation (also Rural Sociology 754 and Agricultural Engineering 754)
Spring. 3 credits.
Hours to be arranged. R. Barker, M. L. Barnett, E. W. Coward, Jr. Examine irrigation and its relation to agricultural and socio-economic 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.

Agricultural Engineering

102 Introduction to Microcomputer Applications (also Computer Science 102)
Fall. 3 credits. Not open to students enrolled in the College of Engineering or to students who have taken any prior computer course at Cornell.
Hours to be arranged: 2 lect, 1 rec, 2 labs. 2 evenings prelims. P. E. Hillman, O. Babaoğlu.
An introduction to the use of application packages on microcomputers. An attempt will be made to assess and demonstrate the capability and limitations of the current generation of personal computers through software for word processing, spreadsheets, database, and other applications. The course will involve very little programming using high-level languages.

110 Farm Metal Work
Fall or spring. 2 credits. Lec. R 9:05; labs, (fall) M or T 1:25-4:25, (spring) M or T 9:05; lab, limited to 24 students, includes instruction in sheet metal work, pipe fitting, hot and cold metal work, and arc and acetylene welding.

132 Farm Carpentry
Fall. 2 credits. Each lab limited to 15 students.
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 Agricultural Engineering and Computing
Fall. 2 credits. Prerequisite: one term of calculus or concurrent registration in a calculus course.
Lec. T 1:25; rec. T, R 8:45; or L 1:25, 3:20; or 3:35. J. R. Cooke.
This course provides an introduction to computing using microcomputers. In addition to the structured programming language Pascal, applications such as word processing, bibliographic searches, data base management, spreadsheet, statistics, and symbolic mathematics will be covered using agricultural engineering and related topics.

152 Computing with Graphics
Spring. 2 credits. Prerequisite: Agricultural Engineering 151.
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. Introduction to descriptive geometry is included.

200 Undergraduate Seminar
Spring. 1 credit.
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.

201 Introduction to Energy Technology
Fall. 3 credits. Prerequisite: high school or college physics. S-U grades optional. Offered alternate years.
Basic concepts of energy transfer and traditional and alternative sources of energy. Design of small systems and appropriate technology are emphasized. Topics include heating, cooling, solar energy, electricity, hydropower, biogas production, and energy economics.

204 Introduction to Computer Uses
Spring. 4 credits. Each lab section limited to 20 students.
Prerequisite: one course in college mathematics or statistics or permission of instructor. S-U grades optional.
An introductory course in computing for those interested in using digital computers to handle data. Topics include preparing and processing computer programs. No prior knowledge of computers or computer language 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 materials, and fluid mechanics to physical problems in agriculture. Topics include force, 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 radiation, and behavior of air and water vapor mixtures. Solving practical problems is emphasized.

211 Agricultural Mechanization: An International Perspective
Fall. 2 credits. S-U grades optional.
A study of the tools and machines that are used to mechanize agriculture, with emphasis on developing countries. Topics include animal and mechanical power, tillage, planting, and harvesting tools and machines; and social considerations.

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 is stressed during field problems related to mapping, construction, boundary surveying, and precise location of land and water features. 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 sophomore year.
Case studies of engineering problems in agricultural and biological systems, including animal and crop production, environmental control, energy, and food engineering. Emphasis is placed on the mathematical, physics, the engineering sciences, and biology to energy and mass balances in agricultural systems.

305 Principles of Navigation
Spring. 4 credits. Lecs. M W F 8; disc. R. B. D. C. Ludington.
Coordinated systems, chart projections, navigational aids, instruments, compass observations, tides and currents, soundings. Celestial navigation: time, spherical trigonometry, motion of stars and sun, star identification, position fixing, Nautical Almanac, Electronic navigation.

310 Advanced Farm Metal Work
Spring. 1 credit (2-credit option available). Prerequisite: Agricultural Engineering 110 or permission of instructor.
Lab F 1:25-4. (second lab must be arranged for 2-credit option). Staff.
Advanced welding and metal construction project.

311 Farm Machinery
Fall. 3 credits. Each lab limited to 16 students. Prerequisite: high school physics or equivalent.
A study of the operating principles, use, selection, and methods of estimating costs of owning and operating farm machines. Lab work includes practice in the
calibration of planting, fertilizing, and pesticide application machinery, and study of the functional characteristics of agricultural machines and machine components.

312 Engines and Tractors for Agricultural Applications
Spring. 3 credits. Each lab limited to 16 students. Missing the first week of classes without permission of instructor is grounds for dropping, so others may register. Prerequisite: high school physics or equivalent.

Lecs, T R 11:15; lab, M T or W 1:25–4:25. Staff.
A study of the principles of operation, maintenance, and use of agricultural engines and tractors. Topics include basic concepts, fuels, tractors, tractors and other farm machines. This course includes lab experience.

315 Electricity: Its Use and Control
Spring. 3 credits. Prerequisite: Physics 102 or equivalent.

The study of electricity and its application to energy generation, distribution, and use. This course includes lab experience.

321 Soil and Water Management
Spring. 2 credits. S-U grades optional.

The study of the principles of soil and water management. This course includes lab experience.

331 Farmstead Production Systems
Fall. 3 credits. S-U grades optional.

A study of the design and management of farmstead production systems. This course includes lab experience.

332 Farm Buildings Design
Fall. 2 credits.

Identification of design loads for farm buildings and design building components. This course includes lab experience.

371 Soil and Water I: Hydrology, Erosion, and Chemical Movement in the Landscape
Fall. 3 credits. Prerequisites: knowledge of soils, one semester of computer programming, and one year of calculus.

Introduction to basic hydrologic processes that control the movement of water in the landscape and how management influences that behavior. This course includes lab experience.

401 Career Development in Agricultural Engineering
Fall. 1 credit. Limited to seniors.

A presentation and discussion of the opportunities and qualifications for, and responsibilities of positions in the agricultural engineering field.

420 Introduction to Marine Pollution and Its Control
Summer. 2 credits. Prerequisite: Biological Sciences 364 or permission of instructor. This course introduces marine pollution and its control, and includes the SML office, G14 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $390.

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 spoil, and radioactive wastes) are discussed from the perspectives of elementary physical oceanography and biological processes. Laboratories include basic methods for targeting and tracking waste water, organic carbon determinations; microbial tests for Salinella, E. coli, and Streptococcus; and practical field projects.

451 Energy Systems Engineering
Spring. 3 credits. Prerequisite: Agricultural Engineering 250, Mathematics 294, and thermodynamics. Not offered 1985–86.

The study of energy systems and their application to the solution of engineering problems. This course includes lab experience.

461 Agricultural Machinery Design
Fall. 3 credits. Prerequisite: mechanical design or equivalent.

The principles of design and development of agricultural machinery to meet functional requirements. Emphasis is given to computer-aided design and analysis of this course includes lab experience.

462 Tractors and Power Units for Agriculture
Spring. 3 credits. Prerequisites: engineering dynamics, thermodynamics, and Agricultural Engineering 250.

Power sources in agriculture. Emphasis is given to basic theory, analysis, and testing of internal combustion engines and other power systems. This course includes lab experience.

465 Agricultural Processing Systems
Fall. 3 credits. Prerequisite: Agricultural Engineering 250.

Grain drying, flow measurement, and material handling for agricultural engineering applications, with an introduction to dimensional analysis and similitude.

468 Engineering Design and Analysis of Food Processing Equipment
Spring. 3 credits. Prerequisite: Food Science 302, its equivalent, or concurrent enrollment in an engineering curriculum.

The analysis and design of equipment for the food processing industry. Emphasis is on maintaining food quality and conserving energy in systems for processing food.

471 Soil and Water II: Application of Engineering Principles to Soil and Water Problems
Spring. 3 credits. Prerequisites: fluid mechanics and Agricultural Engineering 250.

Application of engineering principles to the analysis and design of irrigation systems and surface and subsurface drainage systems. Elements of open-channel flow, closed-conduit flow, soil-water-plant relationships, on-farm water management, water delivery and distribution systems, pumping, and small-scale hydraulic structures will be included.

475 Environmental Systems Analysis
Fall. 3 credits. Prerequisite: computer programming and one year of calculus.

An introduction to system analysis and its application to environmental-quality management. Simulation, linear programming, and dynamic programming applied to problems in water and air pollution control, solid waste disposal, agricultural wastes, and so forth.

481 Agricultural Structures Design
Fall. 3 credits. Prerequisite: Civil and Environmental Engineering 371 or permission of instructor.

Lecs, T R 9:05; disc-lab, R 2:30–4:40. K. G. Gebremedhin.
Application of basic structural concepts and procedures to design of agricultural structures. This course includes lab experience.

482 Environmental Control for Animals and Plants
Spring. 3 credits. Prerequisite: Agricultural Engineering 250, its equivalent, and thermodynamics.

Analysis and design of the thermal environment of animal housing and greenhouses. Heat flow, air flow, psychrometrics, energy balances, thermal modeling, mechanical and natural ventilation, solar energy, and weather phenomena.

491 Highway Engineering
Spring. 3 credits.

Prerequisites: junior standing in engineering, fluid mechanics and soil mechanics (may be taken concurrently). Offered alternate years.

An introduction to engineering design in professional practice, using the design of highways as the subject of study. Students will use current standards and design criteria in five laboratory design projects. Topics of discussion include planning, economic design, human factors and public safety, route location and design, traffic engineering, hydrology and drainage design, soil engineering, highway materials, pavement design, and maintenance.

497 Special Problems in Agricultural Engineering
Fall or spring. Variable 1–3 credits. S-U option.

Special work in any area of agricultural engineering on problems under investigation by the department or of special interest to the student, provided, in the latter case, that adequate facilities can be obtained.

501–502 M.P.S. Project
Fall and spring. 1–6 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.
A comprehensive design project dealing with one of the existing engineering problems in the field. Emphasis is on the formulation of alternative design proposals that include consideration of economies, nontechnical factors, engineering analysis, and complete design for the best design solution.
652 Instrumentation Spring. 4 credits. Prerequisite: electrical systems or permission of instructor. Lecs. TR 12:20-1:35; lab to be arranged. D. J. Areshashian. The application of instrumentation concepts and systems to physical and biological measurements. Instrument characteristics, signal conditioning, shielding and grounding techniques, transducer characterization, data acquisition systems, microprocessor and microcomputer applications, and radio telemetry are considered.

672 Drainage Spring. 4 credits. Prerequisite: Agricultural Engineering 471, fluid mechanics. Not offered 1985–86. Lecs. MWF 10:10; lab, R 1:25-4:25. T. S. Steenhuis. The physics of groundwater flow as related to artificial tile drainage. Critical review of benefits of drainage as well as a thorough analysis of the design of the drainage systems. Laboratories are used to measure physical parameters used in drainage designs.

673 Irrigation Engineering Fall. 3 credits. Prerequisites: Agronomy 200 and Agricultural Engineering 471 or permission of instructor. Not offered 1985–86. Lecs. MWF 10:10. Staff. The physics of the movement into and through the soil as related to the design and analysis of irrigation systems. Computer applications to irrigation scheduling and irrigation systems analyses will be included.

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 related pollution. Fundamentals of biological, 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. Prerequisite: Computer programming and calculus. Recommended: previous course work in hydrology or soil and water engineering. Lecs. MWF 11:15. D. H. Haith. Development and programming of simulation models for management of water pollution from runoff and percolation. Emphasis 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 streamflow and sediment yield.

679 Use of Land for Waste Treatment and Disposal Spring. 3 credits. Prerequisite: permission of instructor. Lecs. TR 3:35-4:50. W. J. Jewell. Covers the social, legal, and technical factors; the properties of land and crop systems that make land 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 1985–86. 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. Prerequisite: Theoretical and Applied Mechanics 310 or permission of instructor. MWF 12:20. J. R. Cooke. Engineering approaches to solving strategies and techniques are explored. Students solve several representative engineering problems that inherently involve biological properties. Emphasis is on 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 Fall. 4 credits. Limited to engineering seniors and graduate students. Prerequisite: one introductory course in soil mechanics or highway engineering. Not offered 1985–86. Lecs. MWF 12:20; lab, F 1:25-4:25. 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 asphalts, 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.


701 Special Topics in Agricultural Engineering Fall or spring. 1–6 credits. Prerequisite: permission of instructor. S-U grades only. Hours to be arranged. Staff. Topics are arranged by the staff at the beginning of the term.

750 Orientation for Research Fall. Limited to joining graduate students. S-U grades only. Lecs, first 7 weeks, M 3:35; remainder to be arranged. L. D. Albright. An introduction to departmental research policy, programs, resources, and degree candidates' responsibilities and opportunities.

754 Sociotechnical Aspects of Irrigation (also Rural Sociology 754) Spring or Agricultural Economics 754) Spring. 3 credits. Hours to be arranged. R. Barker, M. L. Barnett, E. W. Coward, Jr. 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.

761 Power and Machinery Seminar - Spring. 1 credit. Limited to graduate students. Prerequisite: permission of instructor. S-U grades only. Hours to be arranged. R. L. Obendorf. Study and discussions of research and new developments in agricultural power and machinery.

771 Soil and Water Engineering Seminar Fall or spring. 1–3 credits. Prerequisite: graduate status or permission of instructor. S-U grades only. Hours to be arranged. Staff. Study and discussion of design or research or design procedures related to selected topics in irrigation, drainage, erosion control, hydrology, and water quality.

775 Agricultural Waste Management Seminar Spring. 1 credit. Prerequisite: permission of instructor. S-U grades only. Hours to be arranged. Staff. Management of agricultural wastes, with emphasis on physical, chemical, biological, and economic factors affecting waste production, treatment and handling, utilization, and disposal.

781 Agricultural Structures and Related Topics Seminar Spring. 1 credit. Prerequisite: graduate status or permission of instructor. S-U grades only. Disc to be arranged. K. G. Gebremedhin. Consideration of farmstead production systems, with emphasis on biological, economic, environmental, and structural requirements.

785 Biological Engineering Seminar Spring. 1 credit. Prerequisite: graduate status or permission of instructor. S-U grades only. Disc to be arranged. J. R. Cooke. The interactions of engineering and biology, especially the environmental aspects of plant, animal, and human physiology, are examined in order to improve communication between engineers and biologists.

Agronomy


Courses by Subject

Crop Science: 311, 312, 314, 315, 317, 608, 610, 611, 612, 613

131 Basic Principles of Meteorology Fall. 3 credits. Limited to 140 students. Lecs. TR 11:15; lab, T W or R 1:25-4:25. B. E. Dethier. A simplified treatment of the structure of the atmosphere: heat balance of the earth; general and secondary circulations; air masses, fronts, and cyclones; and hurricanes, thunderstorms, tornadoes, and atmospheric condensation. In the laboratory emphasis is on techniques of analysis of weather systems.

260 Nature and Properties of Soils Fall or spring. 4 credits. Prerequisite: Chemistry 103, 207 or 215. S-U grades optional. Lecs. MWF 9:05; lab, M T W R 1:25-4:25. Fall, D. J. Lathwell, spring, T. W. Scott. 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. MWF 10:10; lab, M T W R 1:25-4:25. 1 or 2 field trips during lab periods (until 5 p.m. or on weekends). R. L. Obendorf. Principles of field-crop growth, development and maturation, species recognition, soil and climatic interactions, crop and mineral nutrition, weed control, crop spraying, sequences management systems, and crop improvement are considered. Grain, protein, fiber, and sugar crops are emphasized.
46 Agriculture and Life Sciences

312 Forage Crops Spring. 4 credits. Prerequisites: Agronomy 260 or Biological Sciences 241. Recommeded: Animal Science 112. Lecs, M W F 11:15, lab, M T W 1:25–4:25. 1 field trip during a lab period (until 5 p.m.) or on a weekend. 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 consideration 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 10-11. J. Wright. An introduction to the characteristics and culture of the principal food staple crops of the tropics and subtropics 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 and 104 or Biological Sciences 241. Lecs, T R 9:15; lab, T W R 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. Lecs, T R 11:15; lab, R 1:25–4:25. 2 all-day field trips will be scheduled during the semester. A. G. Taylor. Genesis Experiment Station. (Thaca contact. L. R. Ombendor.) 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. Limited to 35 students. T R 10–11:25. K. P. Gallo. An introduction to the relationships of radiant energy, temperature, moisture, and wind in the atmosphere near the ground. The interplay between physical processes of the atmosphere, plant canopies, and soil is examined. Moisture relationships in the atmosphere-soil-plant continuum, the effects of environmental modification, and the bioclimatic requirements of plants are also discussed.

335–336–337–338 Meteorological Communications 335 and 337; fall; 336 and 338, spring. 1 credit each semester. Primarily for undergraduate meteorology majors. S-U grades optional. Hours to be arranged. Staff. The student becomes acquainted with facsimile, teletype, and satellite receiving equipment and minicomputer data products used in weather forecasting.

360 Earth Resources Inventories Spring. 3 credits. Laboratory fee, $5. Lecs, M W 12:20; lab, M T 12. Staff. Emphasis is on fundamentals for design of land-resource inventories that have broad applications in natural resource management, landscape analysis, and planning. Approaches for incorporating biophysical and cultural and physical influence process and change on landscapes. A laboratory project will provide firsthand experience in inventory design.

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 1:25–4:25, all-day field trip required. R. B. Bryant. The soil as a natural body. Factors and processes of soil formation. Principles of 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 land landscapes 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 9:15. M. W. Walls. An integrated discussion of soil-crop yield relationships, with emphasis on the soil as a source of nutrient minerals 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. T R 11:15, T 1:25–4:25. J. H. Peverly. The chemistry and physiology of higher aquatic plants are studied from the inorganic solid, solution, and gaseous phases of the environment to cellular and subcellular levels of plants. Application of the basic physical and chemical concepts presented to predict effects on aquatic plant management are illustrated in laboratory and field situations.

441–442 Theoretical Meteorology I and II 441, fall; 442, spring. 3 credits each semester. Prerequisites: 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 planetary boundary layer, surfaces of discontinuity, mechanisms of pressure change, and vorticity and circulation.

[447 Physical Meteorology Fall. 3 credits. Prerequisite: a year each of calculus and physics. Offered alternate years. Not offered 1985–86. M W F 12:20. W. W. Knapp. Primarily a survey of natural phenomena of the atmosphere, with emphasis on their underlying 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 9:05; lab, F 2:30–4:25. D. A. Paine. The application 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, W 1:25; lab, R 2:30–4:25. D. A. Paine. A practicum in the history of numerical weather prediction. The student learns to prepare and run a variety of storm situations. Model-generated computer graphics become the basis for a term project. FORTRAN and programming experience helpful but not essential.

[454 Biometeorology Spring. 2 credits. Prerequisite: permission of instructor. Not offered 1985–86. Lec, M 1:25; disc, T 2:30–4:25. 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?" Beginning with Newton's scientific revolution and Darwin's evolutionary theory, we explore the basis of contemporary thought applied to the co-evolution of the biosphere and climate.]

471 Geography and Appraisal of Soils of the Tropics Spring. 3 credits. Prerequisite: Agronomy 260 or equivalent. S-U grades optional. Lecs, W F 12:20; disc, F 2:30–4:25. 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 potential. Lectures introduce principles whose applications are examined through discussions, problem solving, and independent reading.

473 Organic Soils Fall. 2 credits. Prerequisite: Agronomy 260. Offered alternate years. W 1:25–4:25, some field trips will not return until 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. Lecs, T R 11:15, lab, T 1:25–4:25. S. J. Riha. 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. M W F 10:10. M. Alexander. A study of the major groups of soil microorganisms, their ecological interrelationships, and the biochemical functions of organisms in soil.

480 Management Systems for Tropical Soils Spring. 3 credits. Prerequisite: Agronomy 471 or permission of instructor. S-U grades optional. Offered alternate years. Lecs, W F 8, disc, W 2:30–4:25. A. Van Wambeke. Land evaluation in tropical areas and water requirements in semiarid and tropical regions. Management of tropical soils in relation with nitrogen, acidity, liming, erosion control. Effects of cropping systems on soils, soil conservation methods, and

482 Transfer Processes in Soil Spring. 4 credits. Prerequisite: Agronomy 260 or equivalent. Lecs, M W F 11:10–12; disc to be arranged. R. J. Wagener. An introduction to basic principles of water movement in saturated and unsaturated soil, evapotranspiration, gas and heat flow, and solute transport. Applications are considered through discussions and problem sets.

[486 Microbial Ecology Spring. 3 credits. Prerequisite: an elementary course in some facet of microbiology. Offered alternate years. Not offered 1985–86. M W F 10-10. M. Alexander. An introduction to the basic principles of microbial ecology and its applications to the behavior, activity, and interrelationships of bacteria, fungi, algae, and protozoa in natural ecosystems.]

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 to be 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.

566 Use of Soil Information and Maps as Resource Inventories Fall. 2 credits. S-U grades optional. For anyone interested in using soils. Offered alternate years.

566 Use of Soil Information and Maps as Resource Inventories Fall. 2 credits. S-U grades optional. For anyone interested in using soils. Offered alternate years.

568 Water Status in Plants and Soils Fall. 1 credit. Prerequisite: permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985-86. 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. Lec, T R 10:10-11:25. P. L. Steponkus. 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. Lec, M W F 11:15. W. Pick. A study of the development of 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. Carbon exchange, transpiration, microclimate, soil water supply, root functions, and dry-matter distribution in growing crops are covered.

612 Seed Physiology Spring. 3 credits. Prerequisite: plant physiology. T R 8:40–9:55. R. L. Obendorf. 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.


666 Advanced Soil Microbiology Fall. 1 credit. Prerequisite: Agronomy 476 or permission of instructor. S-U grades only for graduate students. T 12:20. M. A. W. Lees. 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. Offered alternate years. Not offered 1985-86.

669 Soil Organic Matter Fall. 2 credits. Prerequisites: Agronomy 260 and Chemistry 357–358 or equivalent. T 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. Not offered 1985–86. 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.

771 Soil Chemistry and Mineralogy Fall. 4 credits. Prerequisites: Agronomy 260 and a year of physical chemistry, or permission of instructor. Offered alternate years. Not offered 1985–86.

Lees, M W F 9:05; lab, R 1:25–4:25. M. B. McBride. Chemical properties of soils, with emphasis on structure and surface chemistry of soil minerals, ion exchange, mineral-solution equilibria, and adsorption reactions of soil clays and oxides. Laboratory exercises will stress the application of modern physical methods to soil mineralogy.

774 Soil Fertility Advanced Course Spring. 3 credits. Prerequisite: graduate status with a major or minor in agronomy, Offered alternate years.

T R 8:30–9:55. D. R. Boulton. A study of selected topics in soil-crop relationships, with emphasis on concepts of soil fertility, interpretation of experimental data, and soil fertilizer chemistry.

790 Agronomy Seminar Fall or spring. No credit. Required of graduate students majoring or minoring in the department.

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791 Meteorology Seminar Fall or spring. Prerequisite: permission of instructor. Hours to be announced. Staff. Subjects such as weather modification, paleoclimatology, and atmospheric pollution.

829 Master's-Level Thesis Research in Crop Science Fall or spring. Credit by arrangement. Limited to students in the graduate field. Hours by arrangement.

859 Master's-Level Thesis Research in Meteorology Fall or spring. Credit by arrangement. Limited to students in the graduate field. Hours by arrangement.

889 Master's-Level Thesis Research in Soil Science Fall or spring. Credit by arrangement. Limited to students in the graduate field. Hours by arrangement.

929 Doctoral-Level Thesis Research in Crop Science Fall or spring. Credit by arrangement. Limited to students in the graduate field. Hours by arrangement.

959 Doctoral-Level Thesis Research in Meteorology Fall or spring. Credit by arrangement. Limited to students in the graduate field. Hours by arrangement.

Related Courses in Other Departments

Forages of the Tropics for Livestock Production (Animal Sciences 403)

Special Studies of Problems in Agriculture in the Tropics (International Agriculture 602)

Protozoan Parasite Structure and Function (Veterinary Medicine 765)

Courses in "Remote Sensing" are listed under the Department of Civil and Environmental Engineering, in the College of Engineering.

Animal Sciences


Spring. 2 credits. Prerequisites: Agronomy 260 and a year of physical chemistry, or permission of instructor. Offered alternate years. Not offered 1985–86.

Lecs, W F 9:05. W. B. Currie. 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.

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.

105 Contemporary Perspectives of Animal Sciences Spring. 1 credit. Limited to freshmen, sophomores, and first-year transfer students. T 1:25, W 12:20. Staff. 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. Lecs, M W F 10:10, lab, M T W R or F 2:45–4:25, or R 10:10–12:20. R. G. Warner. An introduction to animal nutrition covering the 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.


220 Animal Reproduction and Development Spring. 4 credits. Each lab limited to 36 students. Prerequisite: a year of college biology or equivalent. Lecs, T R 9:05; demonstration and lab, M T W R or F 2:45–4:25 or T 10:10–12:35 or F 12:20–2:45. R. H. Foote, J. Parks. 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 concepts, and an 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. Lecs, T R 9:05; disc, T W R or F 2:45–4:25. E. J. Pollak. 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.

230 Poultry Biology Spring. 3 credits. Lecs, T R 11:15; lab, W 2:45–4:25. Field trips during lab periods may last longer. R. E. Austic. 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. Lecs, T R 10:10; lab, M T R 1:25–4:30. D. M. Galton. Introduction to the background and scientific principles relating to dairy cattle production. Laboratories are designed to provide an understanding of production techniques. This course is a prerequisite for Animal Sciences 455.

251 Dairy Cattle Selection Spring. 2 credits. Prerequisite: Animal Sciences 250 or equivalent. Lab, W 12:20–4:25. D. M. Galton. Emphasis on economical and trade traits to be used in the selection and evaluation of dairy cattle. Practical sessions include planned trips to dairy herds in the state.


290 Meat Science Fall. 3 credits. Lecs, T R 8:10, lab, M T W or F 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 on 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. F 2:45–4:25. Field trips. D. L. Cunningham. 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.

331 The Chicken in Biological Research Fall. 2 credits. Prerequisite: one year of biology. S–U grades only. Lecs, T R 11:15; C. C. McCormick. Faculty members will present lectures on the use of the chicken in biological research in the past and present and will supervise preparation of seminars to be given by students on the future use of the chicken in biological research.

[332] Poultry Hygiene and Disease (also Veterinary Medicine 255) Fall. 2 credits. The course will be given only if a minimum of 5 students register for the course. Prerequisites: Microbiology 290 or permission of instructor. Letter grades only. Offered even-numbered years. Not offered 1985–86. Lecs and lab, R 2:05–4:25. R. E. McDowell. The chicken as a model of the infectious and parasitic diseases of poultry and the principles of hygiene applicable to poultry farming for the prevention and control of diseases.

340 Decision Analysis in Animal Production Fall. 2 credits. Prerequisites: Animal Sciences 101 and 102. Recommended: Animal Sciences 250 or equivalent. Lecs, T R 10:10; P. A. Ollaranc. 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.

360 Beef Cattle Spring. 3 credits. Prerequisite: Animal Science 101, 102, 103, 220, 221, or permission of instructor. Lecs, T R 10:10; lab, W 2:45–4:25. M. L. Thonney. 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, T or W 2:45–4:25. R. D. Boyd. The objective is to provide an opportunity to acquire practical knowledge and a technical basis for making decisions in various types of swine enterprises. Emphasis on the types of production systems: selection and breeding programs; reproductive, farrowing, and lactation management; nutrition; herd health; and housing facilities. Laboratories are designed to extend and apply principles introduced in lecture and to provide students with the opportunity to develop management skills.

380 Sheep Fall. 3 credits. Prerequisite: Animal Sciences 101 and 102. Recommended: Animal Sciences 112, 220, and 221. Lec, T R 10:10, lab and disc periods, M 1:25–4:25 every other week. D. E. Hogue. 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.

390 Meat Animal Growth and Evaluation Spring. 2 credits. Prerequisites: Animal Sciences 101 and 102 or permission of instructors. Lecs and lab, W 1:25–4:25. D. H. Beermann. Fundamental biological principles of meat animal growth and factors influencing composition are presented. Principles and techniques of meat animal selection and carcass grading and evaluation are discussed and followed by student evaluation of live animals and the carcasses from them.

400 Livestock Production in Warm Climates Spring. 3 credits. Prerequisite: Animal Sciences 112, 220, or 221 or permission of instructor. Lecs, T R 9:05; disc, W 1:25–3:20. R. E. McDowell. An analysis of constraints of tropical environments to livestock production, roles of animals on low-resource farms, the interdependence of crop and animal subsystems in farmer decision making. 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. Hours 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 production and livestock nutrition. Offered every other year. Lecs, T R 12:30–2:30; disc, T 1:25. V. E. Gracen, R. E. McDowell, 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, 11:15-12:05; 2 labs 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. Not offered 1985–86.
F. L. 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. Not offered 1985–86.
Lec., T R 9:05; lab, W R 2-4:25. S. E. Bloom
A study of the alterations in the genetic material of animals as a result of 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 220, or permission of instructor. Offered odd-numbered years.
Lec., T R 9:05; disc., T or W 1:25–3:20. S. E. Bloom
A study of normal and abnormal chromosomes in higher animals. Lecture topics include chromosome organization, chromosome movement, cytogenetics of aborutions, parthenogenesis, chromosomes and cancer, mitotic and meiotic errors, human clinical cytogenetics, and biotechnology.

420 Quantitative Animal Genetics Fall. 3 credits. Lec., T R 11:15; lab, W R or F 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. Hours 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 421 or concurrent registration in Animal Sciences 420. R 12:00. L. D. VanVleck.
An introduction to methods of research in quantitative genetics and animal breeding, including estimation of heritability, repeatability, and genetic and phenotypic correlations.

423 Fundamentals of Endocrinology Fall. 3 credits. Prerequisite: human or veterinary physiology or permission of instructor.
Lecs., M W F 9:05. W. R. Butler
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.

424 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. W. R. Butler.
Laboratory exercises are designed to demonstrate hormonal mechanisms for each of the major endocrine glands. Laboratory techniques include animal surgery, bile collection, blood flow, 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. Permission of instructor must be obtained at course enrollment. Lecs., T R 9:05 first seven weeks. Labs: M T W R F 8:30–9:30; sec. 1, Aug. 15–21; sec. 2, Aug. 22–28. R. H. Foote.
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. Prerequisite: 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. 4-
Lecs., T R 9:05; labs, 5–9 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 suprovulation, embryo recovery, evaluation, manipulation, freezing, and transfer.

450 Immunophysicsology Spring, 3 credits. Prerequisite: basic immunology and animal physiology or permission of instructor.
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, and relationships between immune and endocrine functioning, and the immunology of aging.

451 Lactation Biology Spring. 3 credits. Prerequisite: either Animal Sciences 220 and Biological Sciences 231 or permission of instructor.
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 227 or permission of instructor.
Lecs., M W F 1:25. One prelim at 7:30 p.m. A. van Tienhoven.
Sex and its manifestations. Neuroendocrinology of reproduction, endocrine behavior, gametogenesis, fertilization, embryonic development, care of the young and reproduction, and immunological aspects of reproduction.

454 Comparative Physiology of Reproduction of Vertebrates, Laboratory (also Biological Sciences 454) Spring. 2 credits. Prerequisite: Animal Sciences 452; concurrent registration in Animal Sciences 452, or permission of instructor.
Hours to be arranged; organizational meeting, F 2:30 first week of semester. A. van Tienhoven.
Provides students with an opportunity to independently design and execute experiments with limited objectives.
50 Agriculture and Life Sciences

college. Limited to juniors and seniors with grade-point averages of at least 2.7. Allows 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) Fall. 2 credits. Prerequisites: physiology, biochemistry, and nutrition, or permission of instructor.

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 an 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.

M W F 12:20. disc, W 11:15 or F 1:25. P. J. Van Soest. 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.


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.

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 undergraduate 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. 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.

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)

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. Consult the section on the Division of Biological Sciences for course descriptions.

Communication Arts


The middle and last digits of course numbers are used to denote specific areas:

00-09 Speech communication

10-10 Interpersonal communication

20-29 Mass communication

30-39 Visual communication and graphic design

40-49 Electronic media

50-59 Journalism and reporting

60-66 Professional writing

67-69 Editing

70-79 Communication planning and strategy (advertising and public relations)

80-89 Research methods and interdisciplinary courses

90-94 Special topics and seminars

95-99 Individualized study

116 Theories of Human Communication Fall, spring, or summer. 3 credits. Not open to first-semester freshmen. S-U grades optional.


An introduction to human communication from a multidisciplinary perspective. Contributions from philosophy, psychology, neurology, social psychology, linguistics, anthropology, and communication theory are considered.

120 Introduction to Mass Media Fall, spring, or summer. 3 credits. S-U grades optional.


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 or spring. 3 credits. Limited to communication majors—freshmen and transfers.


[161 Writing in the Biological Sciences Fall or spring. 3 credits. Freshman Seminar designed for College of Agriculture and Life Sciences students. Concurrent registration is required in Biological Sciences 101—102, 103—104, 105—106, or 109—110. Not offered 1985—86. 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.]
The student will learn the principles of argumentation and the rules of debate. Classroom debates on a 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 Fall, spring, or summer. 3 credits. Limited to 25 nonfreshman students per section. A student not accepted or allowed to drop after the second week of classes. Letter grades only.
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 audiology, rhetoric, linguistics, intercultural communication, and the fine arts are also addressed. Students do frequent skill-building exercises in comprehension and retention.

205 Parliamentary Procedure Spring. 3 credits. Each section is limited to 40 nonfreshman students. No adds or drops allowed after the second week of classes. Letter grades only.
Lec, M 12:20; sec, T or R 2:30–4:25, 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 and the importance 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 100 nonfreshman and communication freshmen students. Not recommended for art or design majors. Project materials cost about $20–$30.
M W F 9:05. C. C. Scherer.
A basic course in the use and importance of visual communication methods and materials in modern society. Posters, charts, displays, photographs, slides, overhead projection, motion pictures, television, and computer graphics are among the topics discussed. Practical projects are assigned.

232 Art of Publication Spring. 3 credits. Each lab limited to 25 nonfreshman students. Project materials cost $30–$50.
Lec, M W T 1:25; lab, M or W 2:30–4:25, R. D. Colle.
A basic course designed to explore visual concepts that increase communication effectiveness through the printed 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, spring, or summer. 3 credits. Limited to 25 communication majors; others by permission of instructor. Project materials cost $50–$80.
T 1:25–4:25, R. D. Colle.
Basic photography: camera handling, film processing, darkroom equipment. Students should become familiar with the public policy and institutional milieu that affect science writing.

235 Print Media Laboratory Fall. 3 credits. Limited to junior, senior, and graduate communication majors. Prerequisite: at least one of Communication 232, 360, or 350.
R 1:25–4:25, J. E. Hardy and staff.
Writing, editing, and layout principles practiced in publishing the Cornell Countryman. Some additional outside work sessions may be required.

236 Scientific Writing for Public Information Fall, spring, or summer. 3 credits. Limited to 25 junior, senior, 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 formats 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.
M W F 9:05, 10:10, or 12:20, W. M. Wilkinson and staff.
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 to Explain and Simplify Scientific and Technical Topics for Newspaper and Magazine Readers, Radio Listeners, Television Viewers, and Educational-Material Consumers. Includes frequent writing assignments. Students should become familiar with the public policy and institutional milieu that affect science writing.

368 Editing Spring. 3 credits. Limited to 25 junior, senior, or graduate students. Prerequisites: one of Communication 250, 350, or 365.
W F 10:10–11:25, J. E. Hardy.

272 Principles of Public Relations and Advertising Fall. 3 credits. Lec, M W F 1:25. Staff. Survey of 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 formulation for appeals. Strategies for media selection and message execution. Introduction to research and regulation.

301 Business and Professional Speaking Fall or spring. 3 credits. Lec, T R 9:05; lab, T or R 10:10–12:05. 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 Fall. 3 credits. Limited to juniors and seniors. Prerequisite: Communication 116 or permission of instructor. Not offered 1985–86.
Theory and practice in leadership and participation in small-group communication. The course examines the values and limitations of group discussion, collaborative behavior, and conflicts in a democracy.

342 Radio and Television Communication Fall. 3 credits. Not offered 1985–86.
An overview of the roles of radio and television in contemporary society. Special 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 Radio Writing and Production Fall. 3 credits. Prerequisite: Communication 120 or permission of instructor.
Lec, T R 1:25; lab, T 2:30–4:25. Staff.
Scripoting and announcing various public information formats for possible use on local and state radio stations. Students create complete broadcasting plans and materials for public and private organizations.

346 Television Writing and Production Spring. 3 credits. Limited to 25 students. Prerequisite: Communication 120 or permission of instructor.
Lec, T R 1:25; lab, T 2:30–4:25. R. D. Colle.
Creation of television information programs, from development of idea through research, scripting, and production.

348 Video Communication Fall, spring, or summer. 3 credits. Prerequisites: Communication 116, 230, and permission of instructor. Not offered 1985–86.
An overview of video communication applications. Examination of various uses of video and visual communication theory. Development of basic competency with portable videotape recording, equipment, audio and visual input to video and production of video and postproduction planning and editing techniques.

350 Writing for Magazines Fall or spring. 3 credits. Limited to students, seniors, and graduate students. No drops after third week. Extensive out-of-class writing assignments.
A course in nonfiction freelance writing for magazines. Intensive fact writing to help students communicate more effectively through the medium of the printed word.
Students will follow the process that takes a manuscript from final draft to page proof. Emphasis will be on copy editing, proofreading, fitting 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 272 or permission of instructor.
A continuation of Communication 272. Examination of the qualitative and quantitative aspects of the mass media and they are evaluated by advertisers. Function of media strategy in the marketing 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 35 juniors and seniors. Prerequisite: Communication 272 or permission of instructor.
M W F 10:10. C. Glynn.
Theoretical guidance 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 communication development and national development systems and their contributions to the development process. Prerequisite: Communication 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 desiring classroom teaching experience under appropriate supervision. Each student prepares a paper on some aspect of the course.

416 Psychology of Communication
Fall. 3 credits. Prerequisite: Communication 116 or permission of instructor.
T R 1:25–2:45. N. E. Awa.
An advanced multidisciplinary 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 116.
Theory and practice in 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 majors. Prerequisite: Communication 344 or 346, Not offered 1985–86. Emphasis on production of television and radio programs for various audiences. Course work is done primarily through individual tutorial arrangement.

423 Broadcast Media Laboratory
Spring. 2 credits. Not offered 1985–86. Emphasis on production of television and radio programs for various audiences. Course work is done primarily through individual tutorial arrangement.

428 Communication Law
Fall. 3 credits. Limited to junior, senior, and graduate communication students; others by permission of instructor.
A practical survey of the law governing mass media, primarily for those working in the field. Coverage includes restraining newsgathering and publication, privacy, defamation, copyright, broadcast licensing, access, and other issues of current interest.

496 Internship
Fall, spring, or summer. 1–6 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 3.0 cumulative average. Students have a faculty course supervisor. The research should be scientific, systematic, controlled, empirical. Research goals should include description, prediction, explanation, or policy orientation and should generate new knowledge.

497 Independent Study
Fall or spring. 1–3 credits, variable; may be repeated to 6 credits. Limited to senior and graduate students. Prerequisite: 3.0 cumulative average. 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 senior 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. Students must use the faculty member's section number to register.

500 Internship
Fall or spring. 1–3 credits, variable; may be repeated to 6 credits. Limited to senior and graduate students. Prerequisite: 3.0 cumulative average. Each student prepares a paper on some aspect of the course.

511 Communication in Organizations
Fall. 3 credits. Prerequisite: Communication 610 or permission of instructor. Not offered 1985–86. Prerequisite: Communication 610 or permission of instructor. Not offered 1985–86. A study of interpersonal communication and cross-cultural communication processes involved in organizational goal setting, renewal, and change.

612 Intercultural and Development Communication
Fall. 3 credits. Open to seniors.
T R 8:30–9:55. Staff.
Study of intercultural communication systems in organizations. Methods for analyzing organizational and human communication effectiveness, including communication audits and network analysis.

613 Communication in Organizations
Fall. 3 credits. Prerequisite: Communication 610 or permission of instructor. Not offered 1985–86. A study of the communication processes and their role in the development of organizational 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.

624 Communication in the Developing Nations
Fall. 3 credits. Open to seniors.
An examination of existing communication patterns and systems and their contributions to the development process. Attention is given to the interaction between communication development and national development in primarily agrarian societies.

626 Impact of Communication Technologies
Spring. 3 credits. Open to seniors.
A study of emerging technologies of communication, such as computers, telecommunication and satellites and their potential 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 writing, process of writing, editing, formatting, and preparation of tables and illustrations; and on advanced and special problems in organization, paragraph development, sentence structure, and usage.

676 Communication Planning and Strategy  Spring. 3 credits. Primarily for graduate students but open to seniors. T R 10:10—12. C. Scherer, R. D. Colle. An analysis of communication problems faced by various kinds of public and private sector organizations. Using case studies, the course explores some of the major components of communication strategies, particularly as they relate to communication planning. Examples are drawn from corporate communication programs, nutrition and health informal education projects, rural development programs, and government public information campaigns.

680 Studies in Communication  Fall. 3 credits. Limited to 40 students. Prerequisites: instructor by permission. T R 10:10—12. D. McDonald, P. Yarbrough. 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.

682 Methods of Communication Research  Fall. 3 credits. Limited to graduate students. M W 10:10—12. C. Gyann. 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 14 students. Prerequisite: instructor by permission. Alternate F 2:30. M. DeTurck. A departmental seminar for students and faculty on contemporary issues in communication.

792 Advanced Communication Studies  Fall or spring. 3 credits. Limited to communications graduate students. May not be repeated. Prerequisite: instructor by permission. Graduate faculty.

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.

989 Directed Graduate Study  Fall or spring. 3–6 credits. S-U grades only. Prerequisite: faculty member's section number to register. Graduate faculty.

Education


605 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 8:05 or 12:20; spring: M W F 12:20. J. Conrey 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 the comprehension of word problems.

110 Introduction to Psychology  Fall or spring. 4 credits. Lecture, M W F 10:10—11:30; laboratory, 1 disc to be arranged. Staff. 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. 3 credits. Lecture, M W F 9:05 (2 secs), or 11:15 (2 secs); lab, T 11:15 or 12:20, or R 11:15 or 12:20. Spring: lecture, M W F 9:05 (2 secs) or 11:15 (2 secs); lab, T 11:15 or 12:20, or R 11:15 or 12:20. Evening exams. J. Conrey, S. C. Pileck and staff. Designed to give students with good high school mathematics backgrounds a unified treatment of the basic concepts of college algebra, analytic geometry, and the elements of calculus. Considerable emphasis is placed on the concept of function, graphing, problem solving, and methods of proof. The computing language BASIC is taught and used to strengthen and integrate the mathematical topics covered.

240 The Art of Teaching  Spring. 3 credits. Lecture, T 12:30—4; labs to be arranged. J. G. 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. T R 10:10—11:30. E. J. Hailer. 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 relations 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. Fall: M W 11:15, 1 disc to be arranged. R. E. Ripple. Spring: lecture, M W 10:10—11, F 9:05 or 10:10 (disc). 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.

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 participation 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 educating will be used.

317 Psychology of Adolescence  Spring. 3 credits. Prerequisite: introductory psychology. S-U grades optional. T R 12:20—1:25. R. E. Ripple. 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, acquaintance with research on adolescent development, and implications for the educational process.

331 Introduction to Agricultural and Extension Education  Spring. 3 credits. Lecture, M 12:30—3:30 lab to be arranged. W. E. Drake. The course is intended for persons interested in careers as professional educators in agriculture. Careers included are secondary school and two-year college teaching, cooperative extension service, technical administrators 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.

355 Youth Organizations  Spring. 3 credits. Prerequisite: introductory psychology or permission of instructor. Lecture, T 10:10; lab to be arranged. R. W. Tenney. The role of selected youth organizations in providing educational experience 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.

340 Theories of Teaching  Fall. 3 credits. Not offered 1985–86. M W 2:30—3:45. G. J. Posner, K. A. Strike. This course is intended to assist the student in conceptualizing the processes and contexts of teaching in school and nonschool settings. The course examines representative theories of teaching and provides an opportunity for students to develop their own views.

352 Reading Statistics  Fall or spring. 1 credit. Prerequisite for spring: concurrent registration in Education 353. 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. Prerequisite: one or more of statistics courses. Prerequisite: Education 352 or concurrent registration, or permission of instructor. T R 9:05—11. J. Millman. A survey of descriptive and multivariate statistical procedures encountered in educational and psychological inquiry. Meaning of concepts and mastery of course content is emphasized; computational details are not. Microcomputers are used extensively in class to develop understanding of the properties of statistical indices.
370 Issues in Educational Policy Spring. 3 credits. M W F 10:10; K. A. Strike. An examination of major 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. Prerequisite: permission of instructor. Charge for photo supplies, approximately $7. T 1:25–4:25; V. N. Rockcastle. A practical, relatively nonmathematical study of some basic relationships and physical interactions in the environment, with emphasis on physics and earth science. Attention is paid to analysis for understanding and techniques for teaching. A two-week session on photography and an individual research project are included. Useful for teachers and environmental educators.

401 Our Physical Environment Fall or spring. 3 credits. Prerequisite: permission of instructor. Charge for photo supplies, approximately $7. W 7:30–10 p.m. Staff. For those who want to develop skills in changing attitudes and behavior toward the environment using newspapers, magazines, and radio. The class produces a weekly environmental awareness column for a local newspaper and writes scripts for a weekly radio program.

404–405 Field Natural History 404, fall; 405, spring. 3 credits each semester. Limited to upperclass and graduate students. Prerequisites: basic biology and ecology and permission of instructor. Education 404 is a prerequisite to 405. Fall: M 10:10, lab, or M 1 R 1:25–4:30; spring: lec, M 10:10; lab, M 1:25–4:30. Staff. This course provides students who plan to be professional environmental interpreters and educators with methods and materials for sensitizing people about the complexity and fragility of their living environment. It provides practical experiences in teaching about the environment in a variety of classroom and out-of-classroom settings.

407 Teaching Elementary Science Fall. 3 credits. W 1:25–4:25; V. N. Rockcastle. 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. 1–3 credits. Prerequisite: one course in statistics. T 9:05–11. J. Millman. An overview of educational measurement organized into three, 1-credit independent modules, each of which can be taken whether or not any of the others are taken. The first module (first third of the term) will treat a myriad of nontechnical testing concerns and practices, such as test bias, mislabeling students, test security and cheating, teaching to the test, invasion of privacy, and testing what a person really knows. Hands-on experience selecting and constructing educational measures will be the topic of the second module. During the last third of the term, emphasis on reliability, validity, and other aspects of test theory will be offered. One course in statistics is a prerequisite only for the third module.

413 Psychology of Human Interaction Fall. 3 credits. Enrollment limited. Prerequisite: permission of instructor. Fee, $5. Not offered 1985–86. T 10:10–12:05. D. E. Hedlund. Designed to develop knowledge of, and understanding of, effective interpersonal communication and interaction. The course is largely experiential audio and video recordings in laboratory sessions. Students should have access to a cassette recorder.

414 Counseling Psychology Spring. 4 credits. Limited to 30 students. Prerequisites: introductory psychology, social or personality psychology, and Education 413. Not offered 1985–86. T 10:10–12:05. D. E. Hedlund. 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 strategy 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 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; R. W. Tinney. 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: credit is contingent on each student's own methods and materials in teaching agriculture, as determined by the instructor. 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 curricula, 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 432. Lec to be arranged; Staff. Determining instructional needs, planning programs of instruction, teaching in groups, giving on-the-job instruction, and evaluating adult education programs in agriculture.

445 Curriculum Design Fall. 3 credits. Education 644 may be taken concurrently. T 10:10–11:30. G. J. Posner. A general practical approach to course planning, Readings, group 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.

446 Implementing Instruction Spring. 2 credits. Lec-lab, W 1:25–4:25; V. N. Rockcastle. A study of the elements of effective instruction in lecture, laboratory, seminar, field trip, and other modes of instruction. Also included are concept and teaching problem analyses, as well as practice in developing and presenting various modes of instruction, with critiques by the class.

447 Instructional Applications of the Microcomputer Fall, spring, or summer. 1–3 credits. R 3–4. (Lab required). H. D. Sutphin. The focus of this course is an introduction to microcomputer technology, 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 is literacy development and introduction to programming. Students propose special projects for Module C. Hands-on instruction is given in modules using the Apple Macintosh, Apple 2 +, IBM PCXT, and IBM PC.

472 Philosophy of Education Fall. 3 credits. T 2:30–4:25; K. A. Strike. 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 W 11:15; disc, 1 hour to be arranged; D. B. Gowin. The topic is value concepts. Issues of value in education are treated philosophically by drawing on normative concepts of value (e.g., self-interest, utility, freedom, rights and duties, justice) from ethics and social philosophy. A theory of value for education is discussed.

477 Law and Educational Policy Fall. 3 credits. M 2:30–4:30; K. A. Strike. A study of recent federal court decisions concerning education. Emphasis on examining legal issues against a background of related educational theory and in terms of the consequences of legal decisions for the development and operation of educational institutions.

478 Economics of Education Fall. 3 credits. S-U grades optional. TR 10:10–11:30. D. H. Monk. An introduction to the use of economic 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.

481 Educating for Community Action Spring. 3 credits. TR 10:10–12:05; R. L. Bruce. The design and execution of educational aspects of community-action programs. Deals with the identification and statement of educational goals, selection of teaching strategies, and evaluation of outcomes.

482 Introduction to Adult Education (also Human Service Studies 411) Fall. 3 credits. Limited to 45 students. S-U grades optional. TR 10:10–12:05. D. Deshler. Focuses on the broad aspects of adult education, including history and philosophy of adult-education programs, philosophy and principles, perspective of the adult learner, media and methods of instruction, and program development. Opportunities are provided for observation of adult education programs in community organizations and agencies.

483 Comparative Studies in Adult Education Spring. 3 credits. S-U grades optional. W 7:30–10:30 p.m. D. Deshler.
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 attach to their course enrollment material written permission from the faculty member who will supervise the work and assign the grade. Staff.
A student may, with approval of a faculty advisor, study a problem or topic not covered in a regular course or may undertake tutorial study of an independent nature in an area of educational interest.

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. S-U grades optional. Staff.
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 2.7. Staff.
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.

547 Improvement of College Teaching Fall, spring, or summer. 2 credits.
Staff.
Concepts of teaching, learning, curriculum, and governance are used to guide practical activities that enhance faculty competence. Recent studies of concept mapping and learning, structure of knowledge, science teaching, adult learning, and evaluation provide a conceptual basis for improving teaching. Videotape techniques will be used to provide a basis for constructive analysis of teaching performance.

590 Special Topics in Education Fall, spring, or summer. 1–3 credits. Prerequisite: permission of instructor. S-U grades optional. Hours to be arranged. Staff.
Study of topics in education not otherwise provided by a department course. Designed for both current administrators and teachers and those entering the profession.

Supervised student teaching in science at the secondary level. Program includes observation and teaching at a local school for a minimum of ten weeks and attendance at required courses. Students must be enrolled in the graduate Program in Science, Mathematics, and Environmental Education.

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 topics will include research on problem solving, women and mathematics, misconceptions, and research on teaching.

606 Seminar in Science and Environmental Education Fall or spring. 1 credit. S-U grades only. T. 7:30–9:30. P. N. Rockcastle and staff.
Discussions center around curriculum development, research and thesis writing, and current problems.

611 Educational Psychology Fall. 3 credits. Prerequisite: introductory psychology. S-U grades optional. M.W.F 1:25. R. E. Ripple.
A basic survey course for graduate students. Emphasis on psychological factors involved in human learning and the educational process. Set in a broad-based conceptual model of any behavioral setting for learning. Appropriate for those seeking an introduction to educational psychology or a refresher course in contemporary educational psychology.

612 Introduction to Psychological Testing Fall. 3 credits. Letter grades only. M W 10:10–11:50. H. Hours to be arranged. J. A. Dunn.
This course provides an introduction to the problems and interests of educational and psychological testing in the social sciences. For purposes of this course, testing is defined as the systematic collection of data from individuals or groups of individuals. This course assumes reasonable familiarity with descriptive statistics and some elementary measurement concepts as reliability, validity, response bias, and measurement error. For the students lacking such a background, it is strongly recommended that students take Education 411 or a comparable course concurrently with 612. It is also expected that students will be familiar with basic psychological concepts as taught in general psychology or introductory educational psychology.

613 A Theory and Methods for Education Fall. 3 credits. Prerequisite: Education 311 or 611 or permission of instructor. T.R 9:05. J. D. Novak.
Prepares students for graduate study in educational psychology. Courses will include an examination of the basic elements involved in educational psychology, the research and development of instruction, and the analysis of educational research. Emphasis will be given to the design of empirical investigations, to the interpretation of results, and to the implications for educational practice.

An examination of the basic elements involved in teaching, learning, and evaluation of methods and materials for teaching. Special emphasis will be given to the design of instructional materials and to teaching methods. Recent work on human cognition will be emphasized, as will the microcomputer as an instructional medium. Students will be the basis for a critical review of major models and theories in instructional psychology and will develop and defend a model of their own.

620 Internship in Education Fall or spring. 2–6 credits. S-U grades optional. Each student, before course enrollment, must obtain the approval of a faculty member who will assume responsibility for supervising the work. Staff.
An opportunity for practical experience in educational professions development.

630 Special Problems in Agricultural and Occupational Education Fall or spring; may also be taken in summer. 1–3 credits. S-U grades optional. Hours to be arranged. R. W. Tenney and staff.
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.
The focus of the course is on the selection, use, and evaluation of methods and materials for teaching occupational subjects. Methods for both group and laboratory instruction are covered. Opportunity is provided through use of modules to develop teaching competencies based upon their individual needs and interests. Development of self-evaluation skills is included. A class project on the development of instructional materials is required.

Current situations affecting agricultural and occupational education curricula are examined. Principles, objectives, and sources of information are developed for planning curricula. Strategies for developing occupational curricula are examined. Consensus for 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. 10:10–11:30. D. B. Govin.
A method for the critical analysis of knowledge and value claims embedded in primary sources is presented. Students use this method of analysis on materials chosen according to their own background or interest. Students develop their materials to the point where they could be used for instructional purposes. A special theory of curriculum developed by the instructor is presented.

644 Curriculum Theory and Analysis Fall. 3 credits. Prerequisite: Education 311 or 611. M W 10:10–11:30. M. 8–10. A. A. Sheldon.
An examination of the basic elements involved in making curriculum decisions and an analysis of current approaches to curriculum. Students learn to analyze curriculum in the context of a conceptual framework. This course is the basic graduate course in curriculum.

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.

Prerequisites 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 clearly and reasonably justify a section of the proposal. Students will be provided ample assistance in constructing a brief thesis proposal of their own.
An overview of selected theories, principles, and related strategies to management of decentralized, professionally staffed, nonformal educational organizations and change 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.


Alternative procedural models for organizing and conducting adult educational education courses are presented. Guidelines and procedures for implementing the models in secondary and postsecondary school settings are emphasized.

685 Training and Development: Theory and Practice Spring. 4 credits. S-U grades optional.

Charge for materials, $15.

Analysis, design, and administration of training programs for the development of human resources in small-farm agriculture, rural health and nutrition, literacy, and nonformal education, and general community development. Designed for scientists, administrators, educator-trainers, and social organizers in rural and agricultural development programs in the U.S. and abroad.

689 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.


This is a graduate-level seminar divided into two parts. Part I: the changing role of formal education in American society and projections of educational practice in the future; implications for psychologists; the computer revolution and its implication for learning and teaching, educational psychology for developing countries and peoples; Is U.S. psychology good enough? Part II: the impact of research on educational practice; principles of instructional system design, individualized instruction; contributions of learning theory to human interaction in educational settings; factors influencing human performance; curricula change for the 1990s. Treatment of topics in part II will be based on a learning-teaching team approach. Each person will prepare and give at least one lecture. Designated teams (self-selected) will prepare collective notes.

715 Seminar in Psychology and Education Fall. Variable credit. Prerequisite: permission of instructor.


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. Offered alternate years.

Hours to be arranged. R. E. Rippel, R. L. Bruce. Deals with adult development and learning behavior from the points of view: educational psychology, social psychology, and sociology. Inferences are drawn from theory and research to the practice of adult continuing education. Appropriate for graduate students in educational psychology, extension in our aging society, factors influencing human performance; curricula change for the 1990s. Treatment of topics in part II will be based on a learning-teaching team approach. Each person will prepare and give at least one lecture. Designated teams (self-selected) will prepare collective notes.

730 Seminar in Vocational Education Fall. 2 credits. S-U grades optional.

For master's degree candidates who have had teaching experience and doctoral candidates with majors 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.
For persons with teaching experience interested in the preparation of occupational teachers. Involvement in the Cornell program of teacher preparation in agriculture is expected.

738 Occupational Education Program: Administration and Supervision
Spring. 3 credits.
This course examines objectives, criteria, and strategies for evaluating programs of occupational education in secondary and postsecondary schools. Evaluation techniques, case studies, and evaluation 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 procedures and problems.

745 Seminar in Curriculum Theory and Research
Spring. 3 credits. Prerequisite: permission of instructor. W 9:05–11:30. J. G. Posner.
Theoretical issues in curriculum and appropriate areas for curriculum research are discussed.

750 Conceptual Problems in Educational Inquiry
Fall. 3 credits. Prerequisite: experience or course work in research. W 12:20–2:20. D. B. Govin.
Techniques and procedures for the critical appraisal of research documents. Practice in such appraisal is required, with primary emphasis on conceptual structures rather than research techniques. Students may use their own research proposals or research products as material for analysis.

752 Organization and Management of Sponsored Research
Fall. 3 credits. S-U grades optional.
M 11:15–12:20. J. D. Dunn.
Designed for doctoral students, advanced graduate students, and practicing researchers who have or expect to have responsibility for the promotion, management, or supervision 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 procurement process, proposal preparation, 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
Spring. 3 credits. Prerequisite: one course in elementary statistics or permission of instructor. S-U grades only.
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.
This seminar is for students who have interest or experience in international rural development or community development. Not offered 1985–86. 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.
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. Prerequisite: permission of instructor.
The educational and program management decisions involved in the adoption of educational technology in extension, rural development, and nongovernmental programs are reviewed, and a variety of decision-making approaches is explored. An overall problem-solving method with case study illustrations is used. Hours to be arranged. A. A. Strike.
Topics to be announced.

785 Behavioral Change in International Rural Modernization
Fall. 3 credits. For students who have interest or experience in international rural development or community development. Not offered 1985–86. J. L. Compton.
This is not a thesis seminar. 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.

786 Experiments in Curriculum Theory and Research
Spring. 3 credits.
This course examines objectives, criteria, and strategies for evaluating programs of occupational education in secondary and postsecondary schools. Evaluation techniques, case studies, and evaluation 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 procedures and problems.

788 Seminar in Curriculum Theory and Research
Spring. 3 credits. Prerequisite: Education 445 and 644, or permission of instructor.
Theoretical issues in curriculum and appropriate areas for curriculum research are discussed.

790 Comparative Extension Education Systems
Fall. 3 credits. Prerequisite: permission of instructor. S-U grades optional.
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.

794 Technology-Focused Decision Making: Models for Extension Educators
Fall. 3 credits. Prerequisite: permission of instructor.
The educational and program management decisions involved in the adoption of educational technology in extension, rural development, and nongovernmental programs are reviewed, and a variety of decision-making approaches is explored. An overall problem-solving method with case study illustrations is used. Hours to be arranged. A. A. Strike.
Topics to be announced.

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.
Staff.

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.
Staff.
Related Course in Another Department
Historical Roots of Modern Psychology (Psychology 490)

Entomology

Courses by Subject
Agriculture: 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, 342, 443, 444, 640, 677
Physiology and toxicology: 411, 483, 685, 690
Systematics and acatology: 331, 332, 621, 630, 631, 633, 634, 636, 674, 710

200 Insects and Man
Fall. 2 credits. S-U grades optional. Intended for students in all colleges.
Lecs, TR 11:15. E. M. Rafsnessperger.
A presentation of the insects, with attention to their roles in nature and in civilization. Biological, historical, social, economic, and cultural aspects are discussed.

212 Insect Behavior
Fall. 3 credits. Prerequisite: Biological Sciences 101–102 (may be taken concurrently) or equivalent.
Lecs, WF 11:15, lab, M T W or R 2:45. G. C. Eckworth.
Introduces the science of entomology by focusing on basic principles of systemsatics, 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 stressing ecological categories is required.

241 Applied Entomology
Spring. 3 credits. Prerequisite: Biological Sciences 101–102 or equivalent.
Lecs, TR 10:10, lab, M T W or R 2:45. E. M. Rafsnessperger.
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.

260 Introductory Beekeeping
Fall. 2 credits.
Lecs, TR 11:15. R. A. Morse.
Introduces the fundamentals of practical beekeeping, including the life history, instincts, and general behavior of honey bees. The classical experiments 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 meet 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 2:45. 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 the 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. Not offered 1985–86. Lecs, M W F 10:10; labs, M F or T R 1:25–4:25. G. C. Eickwort. 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.]

331 Introductory Insect Systematics Spring. 4 credits. Prerequisite: Entomology 212. Lecs, T R 10:10; labs, T R 1:25–4:25. W. L. Brown. An introduction to the classification, evolutionary history, and distribution of the insects. Laboratory practice in the identification of orders, families, and representative genera of insects; methods of collection, preservation, and study. Lectures on theory and practice of insect systematics and major features of insect evolution. Insect collections are required.

[332 Systematics Discussion Group Spring. 1 credit. Prerequisite: concurrent enrollment in Entomology 331 or permission of instructor; S-U grades only. Offered alternate years. Not offered 1985–86. Disc, hours to be arranged. Q. D. Wheeler. Reading and discussion of 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 1985–86. Lecs, T R 9:05. Staff. 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) Fall. 3 credits. Prerequisites: Biological Sciences 311 or Entomology 483. Lecs, M W F 11:15; H. H. Hagedorn, A. van Tienhoven. A comparison of the interaction of the nervous and endocrine systems in vertebrates and invertebrates. Areas covered will include morphology, development, evolution, physiology, and molecular biology of neuroendocrine glands and their hormones.

411 Seminar in Insect Pest Management Spring. 1 credit. Limited to 10 students. Prerequisite: Entomology 212 or 444 or permission of instructor; S-U grades only. Lecs, hours to be arranged. A. M. Shelton, A. J. Sawyer. Discussion of current topics in pest management, with an emphasis on insect pest management.

[443 Pathology and Entomology of Trees and Shrubs (also Plant Pathology 443) Fall. 5 credits. Prerequisites: Plant Pathology 301 and Entomology 241 or equivalent. Not offered 1985–86. Lecs, M W F 10:10; labs, T R 1:25–4:25 or W F 1:25–4:25. C. C. Sawyer and T. R. G. Huddler. 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 and 241, and Plant Pathology 301 or their equivalents or permission of instructor. Lecs, M W F 9:05; lab, M or W or T 1:25–4:25. P. A. Arnason, A. J. Sawyer. 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 and Veterinary Medicine 330, or permission of instructor. Offered alternate years. Not offered 1985–86. 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, bionomics of vector populations, and current control concepts. Morphology and taxonomy of selected groups are examined in the laboratory, with additional emphasis on 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. Not offered 1985–86. Lecs, M W F 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.]

454 Insect Pathology Seminar Spring. 1 credit. Prerequisites: Entomology 453. S-U grades only. Offered alternate years. Hours to be arranged. J. P. Kramer. 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) Spring. 4 credits. Prerequisites: Biological Sciences 261 and Entomology 212 or their equivalents. Offered alternate years. Lecs, W F 11:15; R. S. Root. Ecological and evolutionary principles are integrated by thorough examination of outstanding field sites. Preliminary evening meetings will orient students to the sites chosen.

457 Insect Ecology, Laboratory (also Biological Sciences 457) Spring. 2 credits. Limited to 16 students. Prerequisite: concurrent enrollment in Biological Sciences 455. Offered alternate years. Lab, W 1:25–4:25. R. S. Root. Field experiences focus on insect natural history and methods of sampling populations. Laboratories devoted to reciprocal examination of field data, life-table parameters, and analyzing communities.

483 Insect Physiology Spring. 4 credits. Prerequisite: Entomology 212. Lecs, M W F 11:15; lab, W or F 1:25–4:25. H. H. Hagedorn. 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 comparative methods used in physiological research and to the critical reading of scientific literature.

497 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.

499 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.

530 Field Entomology Spring. 2 credits. Prerequisites: Entomology 331 and permission of instructor. S-U grades optional. Preliminary meetings, T 7–9 p.m. J. K. Liebherr, Q. D. Wheeler. The course will be comprised of 2 or 3 preliminary meetings, and a two-week field trip. During an intensive two-week field course, the arthropod fauna of chosen sites will be surveyed using advanced collecting techniques. Material will be field sorted to allow comparison of the various techniques. The ecological requirements of the sampled arthropods will be investigated. Preliminary evening meetings will orient students to the sites chosen.


634 Special Topics in Systematic Entomology Spring, for spring; taught on demand. 2–4 credits. Prerequisite: permission of instructor. Hours to be arranged. Staff. Lectures on the classification, evolution, and biogeography of selected taxa, with accompanying laboratory studies
on identification and comparative morphology. Collections sometimes required.

636 Seminar in Systematic Entomology Fall or spring. 1 credit. Prerequisite: permission of instructor. S-U grades only.
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.

640 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 1985–86.

662 Insect Behavior Seminar Spring. 2 credits. Prerequisites: permission of instructors and Entomology 212 or Biological Sciences 321 or equivalents. S-U grades optional. Offered alternate years.
Hours to be arranged. G. C. Eickwort, M. J. Tauber.

664 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. Not offered 1985–86.
One evening a week, to be arranged. P. P. Feeny. 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.

672 Seminar in Aquatic Ecology Spring. 1 credit. Prerequisites: permission of instructor and either Entomology 331 or introductory systematic course in another field of biological sciences. Offered alternate years.
Lecs, M W 1:25, disc-labs, M W 2–4:25. Staff. (G. D. Wheeler, coordinator). An introduction to modern theory and methods of systematic biology. Lectures, readings, and discussions on theoretical systematics, including species concepts, classification, phylogenetics, 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.

677 Biological Control Fall. 3 credits. Prerequisite: Entomology 212 or Biological Sciences 261, and permission of instructor. Offered alternate years. Not offered 1985–86.

685 Seminar in Insect Physiology Spring. 1 credit. Prerequisite: permission of instructor. Hours to be arranged. H. H. Hagedorn.

[690 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. Not offered 1985–86.
Lecs, M W F 9:05; lab, day to be arranged. 1:25–4:25. C. F. Wilkinson. The chemistry of insecticides and their metabolism and mode of action in insects and mammals.

707 Special Topics for Graduate Students Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. Not for thesis research. Staff.

708 Graduate Research Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. Not for thesis research. Staff.

709 Teaching Entomology Credit to be arranged. Staff. Teaching entomology or for extension training.

710 Curation in Entomology Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. S-U grades only.
Hours to be arranged. J. K. Lieberr and staff. The range of curatorial techniques required to operate an institutional insect collection will be investigated by working with staff. Curation of a specific taxon of insects will comprise part of the course of study.

800 Master’s-Level Thesis Research Credit to be arranged. Prerequisite: permission of instructor. S-U grades optional. Staff.

900 Doctoral-Level Thesis Research Credit to be arranged. Prerequisite: permission of instructor. S-U grades optional. Staff.

Jugatea Seminar Fall and spring. M 4–5.
A seminar conducted by Jugatea, the entomology club of Cornell University, to discuss topics of interest to its members and guests.

Fioriculture and Ornamental Horticulture


Courses by Subject


100 Introduction to Floriculture and Ornamental Horticulture Fall. 3 credits.

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.

105 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 secretariat in Plant Science room 20 of their absence will automatically be dropped.
T or R 1:25–4:25. C. C. Fischer.

A study of the established formal design techniques of this country, presenting the principles and the mechanics of the art to prepare the student to design 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: plants, animals, and landscapes. An introduction to design and drawing in two-dimensional space. Of particular interest to students in floriculture and ornamental horticulture, landscape architecture, biological sciences, nature education, etc. Outside field. Credit to be arranged.

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.
Fall: rec, R 10:10; studios, T 9:05–11; R 1:25–4:25.
Spring: permission of instructor required (lecture and all studio hours must be scheduled). Lec, T or W 10:10, plus 5 additional studio hours to be scheduled in 2- or 3-hour blocks during M T W R F 9:05–12:20 and T 1:25–4:45. A. Elliot.
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 textbook assignments.

Practice 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. For any 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 and 12:05 M T W F R. R. J. Lambert.
Progression to the organization of complete illustrations. Subject matter largely from sketchbooks, still life, and imagination. Composition, perspective, and ways of rendering in different media are considered.

A study of the trees, shrubs, ground covers, and vines used in landscape plantings. Emphasis is on winter identification and values for use as landscape material.
60 Agriculture and Life Sciences

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 and 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. 3 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. S-U grades optional. 6 studio hours scheduled between 9:05 and 12:05 M T W R F. R. G. Fischer. An advanced study of the art of floral design. The students assist in scheduling the design themes and occasions for floral display during the semester.

312 Garden and Interior Plants I Fall. 3 credits. Fee for lecture-laboratory manual, $20. Lec, T 10:10; lab, T 12:10-2:45. R. G. Mower. 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 identification, 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. Lec, T 10:10; lab, W 10:10-12:05 R. G. Mower. 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. Cost of supplies, $10; one T field trip required. Lec, T 9:05; lab, T 11:15-1:10. A. M. Petrovic. 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. Cost of field trips, $10. Hours to be arranged. A. M. Petrovic. 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. Lec, M W T R F 11:15; lab, M 2-4:25. R. G. Mower. A continuation of Floriculture 312. The first seven weeks are devoted to a further study of interior plants, with emphasis on specialized groups of interior plants such as orchids, succulents, geraniums, 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-blooming 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. Lecs, W F 11:15; lab, F 1:25-4:25. R. T. Fox. 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 florist management and design. Required field trips made to flower shows and to wholesale and retail florist establishments.

342 Botany of Cultivated Plants (also Biological Sciences 342) Spring. 4 credits. Lecs, M W 10-10; labs, M W 2-4:25. J. W. Ingram, Jr. A study of the trees, shrubs, 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 analytical 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. Lec, T R 3-6; lab, R 1:25-4:25 (except field trips lasting 3-6 hr.). K. W. Mudge. 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. Examples include horticultural, agronomic, and forestry crops.

402 Physiology of Horticultural Plants Spring. 4 credits. Prerequisite: Biological Sciences 242 and 244; 341 or permission of instructor. Lec, 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. 6 studio hours scheduled between 9:05 and 12:05. M W F A. Elliot. A survey of techniques of drawing, painting, and mixed media suitable for reproduction processes, including pen and ink, scratchboard, wash, and mixed media.

421 Principles of Nursery-Crop Production Fall. 4 credits. Prerequisite: Floriculture 401. Fee to cover supply costs associated with the course, $35. Lecs, M W F 9:05; lab, M 12:20-2:15; T 3:20-4:20; field trips are included. G. L. Good. Principles of commercial propagation and growth of nursery plants to marketable stage, including the postharvest handling of nursery stock. Some consideration is given to the planting and culture of landscape plants. Field trips are made to commercial nurseries.

424 Principles of Florist Crop Production Spring. 4 credits. Prerequisite: Floriculture 325, Separately for graduate students only. Fee to cover special laboratory supplies, $25. Lecs, M W F 9:05; lab, T 2:45-4:25. 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.

425 Greenhouse Production Management Spring. 4 credits. Primarily for seniors. Prerequisite: An elementary course in horticulture or equivalent. Cost of field trips, $150. 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, greenhouse operation, cut flower production, competition, location, types of structures, ventilation, lighting, 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 equivalent, and permission of instructor. Hours to be arranged. R. G. Mower. Topical subjects in plant materials. Independent study and group study of important groups of woody and herbaceous plant materials not considered in other courses. The topic is given in the supplementary announcement.

497 Special Topics in Floriculture and Ornamental Horticulture Fall or spring. 1 or more credits. S-U grades optional. 601 Seminar Fall or spring. Open for credit to department faculty and graduate students. S-U grades only. R 12:20. C. F. Gottzg and faculty.

600 Seminar Fall or spring. Open for credit to department faculty and graduate students. S-U grades only. R 12:20.

601 Current Topics in Floricultural and Ornamental Horticultural Physiology Spring. Variable credit. Fee to cover cost of special laboratory supplies, $25. Hours to be arranged. F. B. Negm. Discussions of modern concepts, research, and commercial problems as reflected in current horticultural literature.

Landscape Architecture

100 Landscape Architecture Freshman Orientation Fall. 1 credit. Limited to freshman landscape architecture majors. S-U grades only. Hours to be arranged. M. I. Adelman. Introduction to resources supporting Landscape Architecture at Cornell.

140 (340) Landscape Design Studio Spring. 4 credits. Limited to approximately 15 students; primarily for landscape architecture majors. S-U grades only. Hours to be arranged. D. W. Kranz. 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. Lab fee, $20; 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. M. L. Adelman.
A beginning studio course introducing design theory process and design skills applied to projects of limited scale and complexity. The course will focus on design form and expression, the organization of outdoor space, and graphic representation.

202 Project Design and Site-Planning Studio Spring. 6 credits. Prerequisite: LA 201 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.
T. H. Johnson.

Site design and planning for parks, housing, and architectural ensembles: Basic theory, historic precedents, and the design process are correlated with garden landscape, urban landscape, residential development, and site utility systems, earth form, vegetation, and circulation systems.

205 Graphic Communication I Fall. 3 credits.
Prerequisite: concurrent enrollment in LA 203 or LA 501 or permission of instructor. Cost of supplies, about $30.

Basic skills in graphic presentation, including pencil and ink drawing and drafting techniques applicable to landscape architecture projects. Freehand drawing, orthographic projection, axonometric projection, and lettering are covered in the course.

206 Graphic Communication II Spring. 3 credits.
Prerequisite: LA 205.

A continuation of LA 205, which introduces students to more advanced skills. Emphasis is placed on three-dimensional drawing, including perspective construction, rendering, value delineation, and color.

224 Plants and Design Spring. 3 credits. Basic field-trip expenses, about $20.

Basic principles involved in design theory, interpretation, and methodology as they are applied to shaping the landscape environment. Students are introduced to spatial design vocabularies for a variety of environmental scales and spatial types.

501 Theory and Application Studio Fall. 3 credits.
Prerequisite: LA 201 with a grade of C or better. Lab fee, $20; cost of drafting supplies, about $100; basic expenses for field trip, about $200.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.
M. I. Adleman.

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. Presented through a series of lectures, readings, class discussions, exercises, and review of case studies. This course is intended to provide a base for understanding the utilization of landscape ecological knowledge in the planning process. The course is directed to graduate students in landscape architecture, landscape architecture, city and regional planning, ecology, international studies, international agriculture and rural development, and natural resources.

532 Regional Landscape Planning I Fall. 3 credits. Prerequisite: permission of instructor. May be taken independently of LA 531.
Lecs, M W F 9:05. A. S. Lieberman.

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 and rural development level are addressed through review of case studies in North America, Europe, the Middle East, and Australia.

502 Project Design and Site-Planning Studio Spring. 6 credits. Limited to graduate landscape architecture majors. Lab fee, $20; 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 apply 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. Mirin.

521 History of Landscape Architecture I Fall. 3 credits. L. Mirin.

522 History of Landscape Architecture II Spring. 3 credits. L. Mirin.

602 Urban Systems Studio Spring. 6 credits. Limited to graduate landscape architecture majors. Lab fee, $20; cost of drafting supplies, about $100; expenses for field trip, about $200.
Lecs, M T R 1:25; studios, M T R 2:30–4:25.
R. T. Trancik.

Application of urban design and town-planning techniques to specific contemporary problems of city environments. Urban issues in areas of physical design, as well as the public and private sector implications of urban design are investigated. Urban land-use development and open-space typologies are examined.

*621 Summer Internship Seminar Fall. 2 credits. L. Mirin.

An introduction to general research methods and to the diversity of landscape architectural research. Focus will be on conceptual, 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. 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.

701 Advanced Project Design Studio Fall. 6 credits. Limited to graduate architecture majors. Lab fee. Material costs; supplies, about $100 requirements for field trip, about $200. Lecs, M-Th 1:25, studios Q-Th 2:30-4:25. Required 5-day field trip. T. N. Johnson

Advanced studio linking master planning and detail design sequences while including diverse issues such as design research, project management, and environmental impact.

*702 Graduate Thesis Seminar Spring. 3 credits. S-U grades only. Hours to be arranged. L. Minir

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 student's 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


100 Introductory Food Science Fall. 3 credits. Lec and lab, F 9:05-10:10, M 11:15-12:20. W. K. Jordan, N. N. Potter

This course covers 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. Lec, TR 10:10-11:15, N. N. Potter and staff. Members of the staff lecture and lead discussion on selected topics.


*Offered through the College of Architecture, Art, and Planning.

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 206

Lecs, W F 12:20; lab, F 1:25-4:25. J. W. Sherbon. 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, spectrophotometric methods. Procedures for nutrient determination, 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 12:20-4:25. Field trips. R. C. Baker Provides understanding of food industry operations. Half the laboratories are production of food products (such as sausages and pastries) by students 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. TR 10:10-11:15, M. F. Borden and staff.

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 cereals, grains, fresh fruits, and vegetables. Biology and control of weeds, birds, insects, and molds in stored foods; chemical causes of quality loss; simple drying and storage practices; effects of climate. Economic and social factors affecting food preservation and storage technology are discussed.

301 Nutritional Aspects of Raw and Processed Foods (also Nutritional Sciences 301) Spring. 3 credits. Prerequisites: Nutritional Sciences 115 and organic chemistry or permission of instructor. M W F 9:05-10:10

An evaluation of the nutritional qualities of human foods, with an 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, lipid 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.

Lecs, TR 9 05-11, lab, R 1:25, R. R. Zall, R. B. Gravani. 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 100 or equivalent. Offered alternate years. W 12:20; lab, W 1:25. W. K. Jordan, R. R. Zall.

Deals with the physiology of milk and the processing of 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. Lec, T 9:05, lab, R 8:5-9:55, J. M. Regenstein.

Deals with the nutritional needs and the nutrient content of foods. Issues pertaining to diets, food processing, quality, and safety are discussed.

321 Food Engineering Fall. 3 credits. Prerequisites: physics and Food Science 100.

Lecs, M W 11:15; lab, M 12:25. W. K. Jordan. Designed 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 Spring. 4 credits. Prerequisites: Food Science 100 and 321 and Microbiology 290 and 291.

Lecs, T 10:10-11:15; lab, T 1:25-4:25. N. N. Potter, W. K. Jordan, 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 finished products are discussed.

351 Milk Quality Spring. 1 credit. Prerequisite: Animal Science 250 or equivalent or permission of instructor.

F 12:20. D. K. Bandier. Focuses on the important aspects of farm sanitation and milk handling as they affect milk flavor and quality. The course is an overview of quality control tests, basic microbiology, cleaning and sanitizing, and special practices in manufacturing and marketing fresh and storable dairy products.

394 Food Microbiology Laboratory Spring. 2 credits. Prerequisites: Microbiology 290 and 291. M W 12:20. R. A. Ledford.

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. M W 2--4.25. R. A. Ledford.

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.

M W 10:15. J. H. Hotchkiss. A discussion of the sequence of events in developing and marketing new food products. Topics include packaging and labeling, food additive and ingredient regulations, taste panels, market testing, market research, and patents.

402 Product Development Laboratory Spring. 2 credits. Limited to food science majors. Prerequisite: concurrent registration in Food Science 401 and permission of instructor. S-U grades optional. Offered alternate years. L abs, M W 12:25--4:25. J. H. Hotchkiss. Emphasis is on gaining practical experience in the development of new foods.

403 International Food Science and Development Fall. 3 credits. Offered alternate years, not offered 1985--86.

Lecs, T 11:15, disc, R 1:25-4:25. F. V. Kosikowski. A critical evaluation of man's needs for food in the world and the international food technologies, organizations, and policies to meet such needs. Novel extrusion.
ultrafiltration, and fermentation food processes and basic nutrient foods for developing countries are described.

406 Food Processing Fermentations Lectures
Fall. 3 credits. Prerequisite: background in microbiology. Offered alternate years.
Principles and practices of viniculture and enology, cheese and cultured-milk technology, and related fermentations. Taste evaluations and illustrated descriptions of wines, beers, cheeses, cultured milks, and exotic fermented foods are included.

408 Food Processing Fermentations Laboratory
Fall. 2 credits. Enrollment limited. Prerequisite: concurrent registration in Food Science 406. Offered alternate years.
Laboratory exercises and demonstrations in the making of wines, beers, cheeses, cultured milks, and vegetable foods. A field trip provides additional experience.

409 Food Chemistry
Fall. 3 credits. Prerequisite: Biological Sciences 330 or 331.
Deals with the relationship between the chemical composition and properties of foods. Attention is given to the interactions among the components of food.

410 Sensory and Objective Evaluations of Foods
Spring. 3 credits. Prerequisite: statistics.
Deals with the sensory techniques used in evaluating the flavor, color, and texture of foods and the effects of these properties on consumer acceptance. Objective methods for measuring these qualities, and appropriate statistical methods for analyzing the subjective and objective results and establishing a quality-control program.

411 Food Mycology
Fall. 3 credits. Prerequisite: Microbiology 290 or 291 or equivalent. Recommended: Microbiology 296 or equivalent. Offered alternate years.
To acquaint students with important fungi, from the standpoint of their beneficial as well as their harmful effects in food production, preservation, and spoilage. Laboratories deal with morphology, culture and isolation, identification of fungi, and isolation and quantification of fungal toxins.

419 Food Chemistry Laboratory
Fall. 2 credits. Prerequisite: Biological Sciences 330 or 331 and concurrent registration in Food Science 409.
Intended to complement Food Science 409 in developing an understanding of the chemistry of food. Laboratory exercises deal with the chemical properties of food components and changes these compounds 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, and chemistry and 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.
Applications of biophysical 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.
Prerequisite: permission of instructor. S-U grades optional.
A series of lectures, demonstrations, and practical exercises to improve the basic communication skills of the food scientist. The course will deal specifically with presenting scientific data in oral, visual, and written form.

497 Special Topics in Food Science
Fall or spring. 3 credits. Prerequisite: permission of instructor: S-U grades optional.
Staff.
For the food science student. May include individual tutorial and a seminar lecture topic selected by a professor or a group of students, or selected lectures of a course already offered. As topics may be changed, the course may be repeated for credit.

499 Undergraduate Research in Food Science
Fall or spring. 4 credits maximum. S-U grades optional.
Students must attach to their course enrollment material written permission from the staff member who will supervise the work and assign the grade. Except for students enrolled in the honors program, credit will be limited to 4 credits total. Hours to be arranged. Staff.
Independent study.

600 Seminar
Fall or spring. 1 credit. Required of all food science graduate students. S-U grades only.

601 Food Protein Chemistry
Fall. 3 credits. Prerequisite: permission of instructor.
The chemistry and physical chemistry of proteins are discussed critically with respect to current methods of characterizing and purifying proteins. Food protein functionality is emphasized.

603 Food Carbohydrates
Spring. 2 credits.
A consideration of the chemistry of carbohydrates in foods, including sugars, starches, pectins, gums, and cellulose. Emphasis is on their intrinsic chemistry, their origins in raw materials, and the subsequent changes occurring during processing and storage.

604 Chemistry of Dairy Products
Fall. 2 credits.
Limited to 16 students. Prerequisites: organic chemistry, biochemistry, knowledge of dairy-product processing, and approval of instructor. Offered alternate years. Not offered 1985 - 86.
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. Not offered 1985 - 86.
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.
Lecs. MF 8:8; lab. M 1:25 - 3:30 and 4 hours per week to be arranged. J. W. Sherbon.
Deals with instrumental methods widely used in research and industry. Included are 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.
Selected topics with emphasis on the genetics of dairy starter cultures, yeasts, microbial toxins, and spores. Special attention is given to the relationship and importance to food systems.

608 Food Color and Food Pigments
Fall. 1 credit.
Prerequisite: organic chemistry. Offered alternate years.
A survey of chemical and physical 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.
Introduction to the concepts and essentials of toxicology. The various biological responses to toxicants and the in vivo and in vitro methods of assessing toxicity, 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.
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.

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.


Theories and methods for measuring physical and chemical properties of foods and biomaterials. Mathematical techniques for analyzing data, and applying biological factors in engineering calculations and process designs will be emphasized.

Related Courses in Other Departments
Marketing (Agricultural Economics 240)
Food Industry Management (Agricultural Economics 443)
Introduction to Agricultural Engineering and Computing (Engineering Mathematics 151)
Engineering Design and Analysis of Food Processing Equipment (Agricultural Engineering 468)
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.

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: upperclassman or graduate standing. Letter grades only.

650 Special Topics in International Agriculture and Rural Development Fall and spring. 1–3 credits. S-U grades optional. Staff.

703 Seminar for Special Projects in Agricultural and Rural Development Spring. 1 credit. Required for graduate students enrolled in the M.P.S. (Agr.) degree program and majoring in international agricultural and rural development. Others with permission of the program director. S-U grades only.

Economics of Agricultural Geography (Agricultural Economics 150)
Agricultural Trade Policy (Agricultural Economics 439)
Economics of Agricultural Development (Agricultural Economics 464)
Food, Population, and Employment (Agricultural Economics 660–661)
Macroeconomic Issues in Agricultural Development (Agricultural Economics 663)
Microeconomic Issues in Agricultural Development (Agricultural Economics 664)

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 439)

Economics of Agricultural Development (Agricultural Economics 464)
Food, Population, and Employment (Agricultural Economics 660–661)

Macroeconomic Issues in Agricultural Development (Agricultural Economics 663)
Microeconomic Issues in Agricultural Development (Agricultural Economics 664)

Seminar on Latin American Agricultural Policy (Agricultural Economics 665)

[Seminar on Agricultural Trade Policy (Agricultural Economics 730) Not offered 1985–86.]

Agricultural Mechanization: An International Perspective (Agricultural Engineering 211)

Production of Tropical Crops (Agronomy 314)

Geography and Appraisal of Soils of the Tropics (Agronomy 471)

Management Systems for Tropical Soils (Agronomy 480)

Livestock Production in Warm Climates (Animal Science 400)

Forages of the Tropics for Livestock Production (Animal Sciences 403)

Southeast Asia Seminar: The Philippines (Asian Studies 602)

Seminar in Science and Technology Policy in Developing Nations (City and Regional Planning 771)

Seminar in Policy Planning in Developing Nations: Technology Transfer and Adept (City and Regional Planning 772)
Microbiology


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 9:05 (spring only) or 11:15. Evening exams: spring, Feb. 27; Apr. 6, May 1 Fall, W. C. Ghiorse; 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).

M W 2-4:25 or 7-9:30 p.m. (spring only), or T R 8-10:30, 11:15-1:45, or 2-4:25. Fall, W. C. Ghiorse; spring, P. J. VanDemark; summer, staff.

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). 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.

F 1:25-2:30, lab exercises scheduled on a rotating basis; F 2:30-4:30: C. M. Rehkguer. A series of lectures and demonstrations dealing with cell culture methods, especially those required to culture cells of plant and animal 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 1985–86.


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.

M W 11:15–12:30. S. H. Zinder. A consideration of the physiology, morphology, genetics, culture, and taxonomy of important groups of bacteria.

391 Advanced General Microbiology Laboratory Fall. 2 credits. Prerequisites: Microbiology 390 (may be taken concurrently) and permission of instructor. M W 2–4:25. S. H. Zinder. 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.

422 Aquatic Microbiology Spring. 3 credits. Prerequisites: Microbiology 290 or Agronomy 406, and organic chemistry. Not offered 1985–86.


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.

466 Microbial Ecology Spring. 3 credits. Prerequisite: Microbiology 290 and 291 and biochemistry. S-U grades optional. Offered alternate years. Not offered 1985–86.


An introduction to the basic principles of microbial ecology. Attention is given to the behavior, activity, and interrelationships of bacteria, fungi, algae, and protozoa in natural ecosystems.

480 Microbial Physiology Lectures Spring. 3 credits. Prerequisites: Microbiology 290 and 291 and biochemistry. S-U grades optional. Offered alternate years. Not offered 1985–86.


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 is 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. Prerequisite: Microbiology 480 (may be taken concurrently and permission of instructor). S-U grades optional. Offered alternate years.

T R 12:40–1:40. P. R. Mortlock.

The laboratory component of Microbiology 480. Deals with laboratory experiments and techniques used in studying the physiological characteristics of microorganisms.

484 Prokaryotic Cytology Lectures Spring. 3 credits. Prerequisites: Microbiology 290 and 291 and biochemistry. S-U grades optional. Offered alternate years.

M W F 9:05, W. C. Ghiorse.

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.

Hours to be arranged. W. C. Ghiorse.

Cytological and cytochemical techniques, including preparations for light and electron microscopy, that are applicable to the study of prokaryotic cells.

486 Selected Topics in Microbial Metabolism Spring. 2 credits. Primarily for upperclass and graduate students. Prerequisites: beginning courses in general microbiology, biochemistry, and organic chemistry. S-U grades optional. Not offered 1985–86.

T R 11:15–12:30. Staff.

Landscape Architecture

The Landscape Architecture Program at Cornell is sponsored by the College of Agriculture and Life Sciences through the Department of Floriculture and Ornamental Horticulture and the College of Architecture, Art, and Planning. For course descriptions, see the listings under the Department of Floriculture and Ornamental Horticulture.
A survey course intended for students in any year and major. Designed to provide information and to stimulate 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 advisor in Natural Resources or by permission of instructor. Prerequisites: Biological Sciences 101 and 102 or equivalent. Cost of field trips, no more than $10.

250 Introductory Wildlife Biology Spring, first third of term. 1 credit.

251 Introductory Fishery Biology Spring, weeks 6–10. 1 credit.

252 Introductory Forestry Spring, last third of term. 1 credit. Prerequisites: Natural Resources 210 or permission of instructor.

302 Forest Ecology Fall. 3 credits. Cost of trip, no more than $20.

305 Maple Sap Production Spring. 2 credits. Limited to 20 students. Prerequisite: permission of instructor. Latter grades only. T 1.25–4.25. 3-credit course to develop an understanding of the maple sap industry, its history, and its future. Topics include maple syrup production, equipment, and economics. Students will be expected to lead discussions on recent primary literature in maple sap science.

360 Earth Resources Inventories (also Agronomy 360) Spring. 3 credits. Lab fee, $5.

Related Courses in Other Departments

699 Microbiology Seminar Fall and spring. Required of all graduate students majoring in microbiology and open to all who are interested. Hrs to be arranged. Staff.

791 Graduate Seminar in Microbiology Fall and spring. 1 credit each semester. All students in the graduate field of microbiology must enroll for at least their first three semesters in residence. Students will be expected to lead discussions on recent primary literature in microbiology. S-U grades only. Hrs to be arranged. Staff.

792 Graduate Research Seminar in Microbiology Fall and spring. 1 credit each semester. 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. Hrs 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)

Protozoan Parasite Structure and Function (Veterinary Medicine 765) Not offered 1985–86.

Natural Resources

305 Maple Sap Production Spring. 2 credits. Limited to 20 students. Prerequisite: permission of instructor. Latter grades only. T 1.25–4.25. 3-credit course to develop an understanding of the maple sap industry, its history, and its future. Topics include maple syrup production, equipment, and economics. Students will be expected to lead discussions on recent primary literature in maple sap science.

360 Earth Resources Inventories (also Agronomy 360) Spring. 3 credits. Lab fee, $5.

Lecs, M W F 12–20; lab, M T 2. Staff. Emphasis is on fundamentals for design of land-resource inventories that have broad applications in
natural resource management, landscape analysis, and planning. Approaches will incorporate biophysical and cultural factors that influence process and change on landscapes. A laboratory project will provide firsthand experience in inventory design.


International aspects of environmental and natural resources 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 systems. Current issues: e.g., acid precipitation, management of migratory whales, fish, and waterfowl; Antarctic development; global energy issues; and preservation of fragile and endangered resources. Lecture and discussion, term paper, and examinations.

406 Conducting Marine and Natural Resources Extension Programs Spring. 3 credits. Offered alternate years.


Extension educational programs aiding users of marine and natural resources have similarities to, but also significant differences from, more traditional extension programs. This course will provide an overview of approaches to extension programming in these emerging fields and give attendees experience in components important in successfully 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. Bair.

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 progress, 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; 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 analyses of the ecological basis for decision making in wildlife management, with further considerations of sociological, economic, and legal factors within both historical and future time frames.

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 weekdays; 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.

R. A. Malecki.

For description, see listing under "Courses in Marine Science," in the section on the Division of Biological Sciences.

430 Dynamics of Animal Populations Spring. 2 credits. For seniors and graduate students in natural resources; others by permission of instructor. Offered alternate years.


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 B. T. Wilkins; C. Krueger.

Principles and problems in the management of freshwater and marine fishery resources, considered in relation to problems of human population and management of other natural resources.


Principles and theories involved in dynamics of fish populations. 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. Not offered 1985–86. 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. Prerequisite: permission of instructor. S-U grades optional.


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 optional.


498 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.

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.

Multidisciplinary 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 $20.


This course requires an understanding of broad ecological concepts relative to plant–wildlife interactions. The concepts of niche, habitat, and ecotone are addressed 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 visited during weekend field trips. 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. Prerequisites: 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. Not offered 1985–1986.


A seminar discussing the law and issues concerning current marine policy questions, such as coastal zone management, marine fish regulations, marine mammal protection, and wetland preservation.

607 Ecotoxicology Spring. 3 credits. Prerequisites: graduate or senior status and Biological Sciences 468 or two 300-level courses in chemistry, biochemistry, or toxicology.


Lectures, readings, and special guest foci on the principles of effects of toxic chemicals on natural ecosystems, their components, and processes. Major topics include fate and transport of chemicals (distribution, biogeochemistry, biotransformation), chemical toxicology, ecosystem process analysis, simulation through mathematical and physical (microcosm) models, and relationships to regulation and environmental management.

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.


Impacts of habitat alteration and physical–chemical perturbations, with emphasis on the 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. S-U grades optional. Cost of weekend trip, no more than $15.

W 1:25–3:50; 2 or 3 extra class sessions for presentations of papers and projects. Weekend trip in late September. R. A. Baer.
How the humanities, particularly religion, philosophy, 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) the ethics of toxic wastes disposal, and (4) concepts of growth and progress in Western culture and their impact on our treatment of the environment.

612 Wildlife Science Seminar Fall and spring. 1 credit. Prerequisite: permission of instructor. S-U grades optional. Hours to be arranged. T. A. Gavel. Discussion of individual research or current problems in wildlife science.

700 Ecotoxicologic Methods Fall. 4 credits. Prerequisites: Natural Resources 607 or permission of instructor. Labs, MWF 1:25-4:25; lec/disc, M 12:25. J. W. Gillette. Laboratory and field problems in bioassay, instrumental analysis, and field techniques demonstrate aspects of data quality control and assurance, interpretation, and utility in ecotoxicologic assessment. Standardization and test protocol development are emphasized. Work covers material from all media and microorganisms, terrestrial and aquatic vertebrates, invertebrates, and plants.

800 Master's Thesis Research Fall and spring. Credit to be arranged. Limited to graduate students working on master's thesis research. S-U grades only. Staff.

900 Ph.D. Thesis Research Fall and spring. Credit to be arranged. Limited to graduate students working on Ph.D. thesis research. S-U grades only. Staff.

Related Courses in Other Departments
See department advisers and curriculum materials for information about other related courses.

Environmental Biology (Agriculture and Life Sciences 695)

Resource Economics (Agricultural Economics 250, 350, 450)

The Vertebrates (Biological Sciences 274)

Phylogeny (Biological Sciences 348)

Oceanography (Biological Sciences 461)

Limnology (Biological Sciences 462)

Mammalogy (Biological Sciences 471)

Ornithology (Biological Sciences 475)

Biology of fishes (Biological Sciences 476)

Insect Biology (Entomology 212)

Managing the Aquatic Environment (Environmental Toxicology 304)

Ecology and Management of Disturbed Aquatic Systems (Environmental Toxicology 605)

Effects of Ecological Perturbations on Fishes (Environmental Toxicology 609)

Plant Breeding


Biometry courses are listed under "Statistics and Biometry."

225 Plant Genetics Spring. 4 credits. Prerequisite: one year of introductory biology or permission of instructor. Limited to 50 students. Lects, MWF 9:05, lab, T or W 1:25; lab section assignments at first lecture. Labs start first week. M. A. Mutschler. An overview of genetic principles is related to plant sciences. Mendelian inheritance and cell mechanics, DNA as genetic material, genetic fine structure and gene regulation, gene recombination, linkage and mapping, gene interaction, extranuclear inheritance, environmental effect on phenotypic expression, gene mutation and chromosomal aberrations; variation in chromosome numbers, genes in populations, multiple gene inheritance, tissue culture, and genetic engineering. Students conduct an independent inheritance project with Brassica campestris.

401 Plant Cell and Tissue Culture Spring. 2 credits. Prerequisite: a course in plant physiology, cell biology, or genetics, or permission of instructor. Not offered 1985-86. Lects, T R 10:10. E. D. Earle. Lectures and demonstrations dealing with the techniques of plant tissue, cell, protoplast, embryo, and anther culture and the applications of these techniques to biological and agricultural studies. Current and proposed methodologies and manipulations of cultured cells will be discussed.

402 Plant Tissue Culture Laboratory Spring. 1 credit. Enrollment limited. Prerequisite: Plant Breeding 401 (may be taken concurrently) and written permission of instructor. W 1:25-4:25 plus 1 hour to be arranged alternate weeks. E. D. Earle. Laboratory exercises complementing Plant Breeding 401. Techniques for establishing, evaluating, and utilizing plant organ, embryo, callus, cell, protoplast, and anther cultures will be covered. Experiments will use a broad range of plant materials.

603 Methods of Plant Breeding Spring. 3 credits. Prerequisites: Biological Sciences 101-102; Biological Sciences 281 or Plant Breeding 225 or equivalent, and field crops, vegetable crops, floriculture, or pomology. M W F 11:15. W. R. Coffman. Breeding methods, systems, and operational procedures for producing commercial crop varieties are considered in detail, with emphasis on an integrated, interdisciplinary approach to major breeding objectives, including agronomic characteristics, quality characteristics, disease resistance, insect resistance, drought and flood tolerance, adverse soil tolerance, and adverse temperature tolerance.

604 Methods of Plant Breeding Laboratory Fall. 2 credits. Prerequisites: Plant Breeding 603 or equivalent. T R 1:25-4:15. R. E. Anderson. Selection techniques, screening for heritable variation, and controlling pollination. Special emphasis is on selection for disease resistance and improved nutritional quality and on use of exotic germ plasm. Involves several field trips to both public and private breeding programs.

605 Physiological Genetics of Crop Plants Spring. 3 credits. Prerequisites: either genetics, biochemistry, and plant physiology, or permission of instructor. Offered alternate years. T R 8-10. D. H. Wallace. Both genetic and environmental influences on biochemical and molecular control of plant variation in physiological phenomena such as photosynthesis, respiration, translocation, self-incompatibility, male sterility, maturity, yield, and heterosis are discussed. Emphasis is on variation that can be exploited in plant breeding, particularly in breeding for higher yield and adaptability.

622 Seminar Fall or spring. 1 credit. S-U grades only. T 12:20. Staff and graduate students.

629 Special Topics in Plant Science Extension Spring. 2 credits. Not offered 1985-86. F 1:25-4:25. W. D. Pardee. Designed for graduate students and advanced undergraduates to provide a broader knowledge of cooperative extension philosophy and methods. Developed for students interested in extension and research in public and commercial organizations. Topics relate to extension in other countries as well as in the United States.

650 Special Problems in Research and Teaching Fall, spring, or summer 1 or more credits by arrangement with instructor. Undergraduates must attach to their course enrollment material written permission of the staff member who will supervise the work and assign the grade. Staff.

717 Quantitative Aspects and Related Issues of Plant Breeding Spring. 3 credits. Prerequisites: Plant Breeding 603 and Statistics 601. 2 credits. Prerequisite: Plant Breeding 603 or Statistics 601. T R 8:30-10. R. L. Plaisted, D. R. Viands. Discussion of random-planting populations, inbreeding, components of variance, growth and development, and other issues pertaining to breeding of cross-pollinated crops.

718 Genetics and Breeding for Disease and Insect Resistance Fall, weeks 1-7. 1 credit. Prerequisite: Plant Breeding 603. S-U grades only. T R 10. V. E. Gracen. Discussions of genetics and mechanisms of insect and disease resistance as they relate to the development and utilization of pest-resistant varieties.

774 Perspectives in Plant Breeding Strategies Spring. 2 credits. S-U grades optional. Prerequisite: Plant Breeding 603. R 12:20-2:30. M. E. Sorrells. Selection techniques and breeding objectives, methods, and strategies for both self- and cross-pollinated crops are reviewed and discussed. Extensive outside reading is required. Emphasis is on discussion and evaluation of selected benchmark papers and current literature.

800 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. Lects, T R 11:15; lab, M T W R F 1:25-4:25 plus one period weekly, scheduled at the convenience of the student. W. A. Sinclair. An introduction to the theory and practice of plant pathology, with emphasis in lectures on principles in which they relate to interactions of plants and pathogens, and in laboratories on diagnostic criteria, life cycles of pathogens, and epidemiological phenomena and control. Specific aspects considered in detail include fungi, bacteria, nematodes, viruses, and mycoplasmas as plant pathogens; attack and resistance mechanisms; environmental influences; disease forecasting and loss assessment; development of resistant plants; and chemical and biological control.
309 Introductory Mycology  Fall. 4 credits. Prerequisites: a year of botany or equivalent and permission of instructor.

402 Plant Disease Control  Spring. 3 credits. Prerequisite: Plant Pathology 301 or equivalent.
Lecs, T R 11:15; lab and rec, T W or R 1:25–4:25. P. A. Arnesson. 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. Not offered 1985–86.
Lecs, M W F 10:10; labs, T R 1:25–4:25 or W F 1:25–4:25. Everyone. 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 anthropod pests of trees and shrubs, Forest, shade, and ornamental plants are considered.

444 Integrated Pest Management (also Entomology 444)  Fall. 4 credits. For description see Entomology 444.

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. Prerequisite: permission of instructor. S-U grades only. Hours to be arranged. Staff. Weekly discussion of current topics in special areas of plant pathology and mycology. Students are required to do extensive reading of current literature and to present oral and written reports.

641 Cytology of Plant Diseases  J. R. Aist, H. W. Israel.
642 Plant Disease Epidemiology  P. A. Arnesson, W. E. Fry.
645 Plant Virology  M. Zaitlin, W. F. Rochow.

647 Bacterial Plant Diseases  R. S. Dickey, S. V. Beer.
648 Pathogen and Disease Physiology  H. D. VanEtten.
649 Mycology Conferences  Fall. R. P. Korf.
Agaricales and gasteromycetes.


651 Diseases of Fruit Crops  For graduate students and advanced undergraduates with a particular interest in fruit. Autotutorial and slide and tape sets. P. A. Arnesson. Covers the economic importance, causal agents, symptoms, disease cycle, and control measures for the major diseases of 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.

681 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 Advanced Plant Pathology  Spring. 4 credits. For graduate students with a major or minor in plant pathology; others by permission. Prerequisite: Plant Pathology 301 and 309 or equivalent, and permission of instructor. Lecs, T R 11:15; lab, T 2–4:25; disc, R 2–4:25. R. L. Millar. Conceptual basis of plant pathology in terms of the nature of disease, etiology, stages in pathogenesis, epidemiology, and pest management. Laboratories involve exercises illustrating concepts; discussions integrate lectures and laboratory topics.

711 Biology of Plant Pathogens  Fall. 4 credits. Limited to graduate students with a major or minor in plant pathology. Prerequisites: Plant Pathology 301 and 309, or equivalent with permission of instructor. Lecs, T R 11:15; lab, T R 1:25–4:25. S. V. Beer, M. B. Harrison, M. Zaitlin, and staff. Provides instruction and practice in the diagnosis of plant disease and the biology of plant pathogens. All important classes of plant pathogenic agents are considered. Classical and modern techniques are discussed.

735 Advanced Plant Virology  Spring. 3 credits. Prerequisite: permission of instructor. 2 lecs, 1 lab. M. Zaitlin, P. Palukonis. Topics in plant virology, with an emphasis on student participation in discussion of current literature. Topics included are virus structure, viral and viroid replication, DNA plant viruses and their potentials for plant transformation, mechanisms of vector transmission, mechanisms of pathogenesis, and control measures for plant viruses. Laboratory topics will be adjusted to accommodate the needs and interests of the participants but could include molecular hybridization, serology, electrophoresis, proteoplast, and tissue culture applications.

736 Plant Nematology  Spring. 3 credits. For graduate students with a major or minor in plant pathology; others by permission. Prerequisite: permission of instructor.

737 Bacterial Plant Pathogens  Spring. 3 credits. For graduate students with a major or minor in plant pathology. Prerequisite: Plant Pathology 301 and 711 or permission of instructor. Lecs, T R 9:05; lab, W or F 1:25–4:25. R. S. Dickey. Basic information on bacterial plant diseases and phytopathogenic bacteria. The laboratory includes some of the more important techniques used in the study of bacterial plant pathogens.

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. Not offered 1985–86. 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.
Lecs, 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 and biology of four major groups of plant pathogenic fungi (rusts, smuts, fungi imperfecti, Peronosporales).

756 Advanced Plant Nematology  Fall. 3 credits. For graduate students with a major in plant pathology and special interest in nematology. Prerequisite: permission of instructor. Offered alternate years. Hours to be arranged. W. F. Mai, M. B. Harrison, B. B. Brodie.

759 Taxonomy of Fungi  Fall. 3 credits. Prerequisites: Plant Pathology 309 or equivalent, genetics, plant or animal taxonomy, and permission of instructor. Offered alternate years. Not offered 1985–86. Lecs, M 10:10; labs, M W 1:25–4:25; required field trips. R. P. Korf. Emphasis is on the principles of taxonomy and critical evaluation of keys and monographs, and practice in identification. The Discomycetes are treated in detail.

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.


100 Introductory Pomology  Fall or spring. 3 credits. S-U grades only for graduate students. Lecs, 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. Oberly.
A study of the general principles and practices of fruit culture and their 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, site and soil selection, and planting.

208 Economic Fruits of the World  
Spring. 3 credits. Prerequisite: introductory biology or permission of instructor. Offered alternate years.

Lecs, M W 10; lab, F 1:25–3:55. F. W. Liu

The economic importance of subtropical and tropical fruits such as citrus, banana, pineapple, mango, coffee, and cacao is 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 4½ weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. S-U grades optional. Offered alternate years.

Lecs, M W 9:05; lab, W 2–4:25. J. N. Cummins

This course is intended to familiarize the fruit producer with the operations and problems of the fruit-tree nursery operation. Topics include production objectives, management decisions, and cultural aspects of nursery operation. Techniques of grafting, budding, pest identification, inspection, and grading of fruit-tree planting stocks are included.

304 Orchard Management I  
Spring. 3 credits. Prerequisite: Pomology 100. Recommended: Pomology 304.

Lecs, M W 6; lab, M 1:25–4:25. L. E. Powell

A discussion of the importance of tree fruits, 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 6; lab, M 1:25–4:25. G. H. Oberly

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.


A study of the evolution, breeding history, and biology of strawberries, raspberries, blueberries, and currants and of cultural practices used to maximize production. Emphasis will be placed on understanding how cultural practices influence growth, development, and fruiting, and protecting these species from diseases and insects.

307 Viticulture  
Fall. 3 credits. Prerequisite: Pomology 100 or permission of instructor. Offered alternate years.

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 ampelography, meteorology, soils, vine and grape anatomy and physiology, as well as protection of the vine and grapes from diseases, 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. Not offered 1985–86; next offered 1986–87.

Lecs, T R 9:05; lab, R 2–4:25. G. H. Oberly

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. Not offered 1985–86; next offered 1986–87.

Lecs, T R 9:05; lab, 1:25–3:55; two field trips, R 12:30–3:30. 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 requirements and proper handling of raw materials and how they affect the quality of end products.

315 Fruit Variety Improvement  
Fall, last 4½ weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985–86; next offered 1986–87.

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  
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. Bartsch

The Physiology and chemical changes of postharvest fruits, vegetables, flowers, and ornamental crops are studied. Postharvest factors that affect the quality and marketability of the products are considered. The principles and methods of handling and storing horticultural crops are discussed.

320 Commercial Harvesting, Handling, and Storage of Fruits  
Spring, second 3½ weeks. 1 credit. Prerequisite: Pomology 319, Vegetable Crops 319, or Agricultural Engineering 319.

Lecs, M W F 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 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 optional. Offered alternate years. Not offered 1985–86; next offered 1986–87.

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  

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.

602 Effective Horticultural Research  
Spring. 2 credits. Undergraduates admitted by permission of instructor. S-U grades optional. Offered alternate years. Hours to be arranged. A. N. Lakso

Methods of problem solving in research will be examined with emphasis on horticultural problems. Involving the student in projects 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.

604 Growth and Development of Woody Plants  
Spring. 2 credits. Prerequisite: introductory plant physiology. Offered alternate years.

T R 9:05. L. Powell

An advanced course dealing with physiological, morphological, and biochemical changes during development, beginning with the seed and advancing through the mature reproductive plant. Hormonal control mechanisms are emphasized.

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.

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. Staff

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 Sciences 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


Note: Students seeking to fulfill their group C requirements may do so through several equivalent courses: Rural Sociology 100, 101, 102, 105, and 206 and Sociology 101. Rural Sociology 101 and Sociology 101 have identical content.

101 Introduction to Sociology  
Fall. 3 credits.

Lecs, TR 10:10; disc, M 9:05, 10:10, 11:15, 12:20, 1:25, or 2:30 and F 10:10, 11:15, 12:20, or 1:25. (See also Sociology 101 for alternative times.)

C. C. Geisler and staff.

Topics covered include most of the following: socialization, culture, deviance, social control,
interpersonal interaction, small groups, organizations, bureaucracy, family, inequality, mobility, race and ethnic relations, population dynamics, urbanization, public opinion, social change, social movements, modernization, methods of research, and applications. Weekly section meetings actively involve students in the practical utilization of sociology. Case histories and application exercises are analyzed concerning social problems such as urban tensions, cultural differences, rural conflict, family violence, expanding populations, and high rates of crime.

102 Introduction to Rural Sociology: Ecological and Sociological Perspectives Fall. 3 credits. S-U grades optional. Lecs, TR 10:10–11:15. M or F 9:05, 10:10, 11:15. 12:20, 1:25, or 2:30. H. R. Capener and staff. Objectives of the course will be, from a sociological and ecological perspective, to gain an understanding of the structural and functional relationships between and among populations, their environments, and their patterns of social organization; to gain an overview of the power of influence technology has had and will continue to have; and to examine and compare explanatory models for analyzing and understanding current issues and problems. Rural society in America—its past, present, and projected future—will be the common theme.

104 Proseminar: Issues and Problems in Rural Sociology Fall. 1 credit. S-U grades only. R 12:20–12:55. Staff. Introduces the student to subject matter of concern to both applied and academic rural sociologists. Focuses on such subjects as migrant workers, agribusiness, rural poverty, rural-to-urban migration, rural development, agricultural research and people, community development, and small farmers in the less-developed countries. These topics are explored through the use of films and group discussions.

175 Issues in Contemporary American Indian Societies Spring or summer. 3 credits. Spring. M W F 11:15. R. Fougner. American Indian people are confronted with a myriad of special circumstances that impinge upon their everyday lives. The purpose of this course is to present the background section on the view of an American Indian point of view. Early history and the postcontact period will be reviewed with an emphasis given to recent developments (1923 to the present). Topics such as land claims, treaties, education, mineral and water rights, social problems, militant organizations, and civil rights will be covered, with guest lecturers and media presentations giving added impact.

205 (105) Rural Sociology and Agrarian Problems Spring. 3 credits. M W F 10:10. E. W. Coward, Jr. An introduction to the analysis of some pressing social problems of contemporary Third World countries. Lectures and reading materials will present different approaches, analyses, and recommendations that follow from contemporary sociological thought. Whether the student may determine which approach best explains the situation in Third World countries. Topics to be considered include visions of "development"; the social organization of peasant communities and large-scale agricultural enterprises; problems of land tenure and agrarian reform; the relationships among population growth, hunger, and employment; multinational corporations; and social movements and social control.

[213 Social Indicators and Data Management in Poor Countries Spring. 3 credits. Not offered 1985–86. M W F 11:15. F. W. Young. A survey of definitions and measures of welfare and social structure. General principles of social-indicator research will be illustrated from data on Tunisia, Kenya, Mexico, and other countries in the areas of poverty and level of living, inequality, agricultural productivity, environmental problems, and status restrictions on minorities and women. The course will cover 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 exercises in 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: AFS 100, Anthropology 230, or permission of instructor. TR 10:10–11:15. 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. Prerequisite: AFS 100, Anthropology 230, or permission of instructor. TR 10:10–11:15. S. Saraydar. An exploration of the diverse expressions of philosophy to be found in the world of American Indians. Novel, political, and religious writings, religious literature, the works of philosophers, and the historical and religious writings of the culture will be considered. The purpose of this course will be to identify and explore the intellectual characteristics that are unique to American Indian philosophy.

301 Theories of Society (also Sociology 401) Fall. 4 credits. Prerequisites: Rural Sociology 100 or 101, or Sociology 101. S-U grades optional. TR 11:15–12:15. P. R. Ebers. A lecture course for juniors, seniors, 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, and (2) major classical theorists (Max, 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. M W F 11:25. F. H. Buttel. An exploration of various sociological approaches to the study of society and its physical environment and an analysis of the shifting resources of people, society, and the environment. The role of population in these changes will be examined. The concepts of community, community change, and environmental policy will be used to explore the linkages between society and its physical environment.

355 Rural Development and Cultural Change Fall. 3 credits. Lecs, TR 10:10, disc, T or R 11:15. M. L. Barnett. An analysis of planned social-change programs in predominantly agricultural societies. Focuses on principles of development management, the sociocultural aspects of rural development, and the introduction of new practices in the context of cultural milieus.

356 Rural Society in America Fall. 3 credits. S-U grades optional. M W F 9:05. H. Capener. A new awareness and image of rural America is examined. The population turnaround 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 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 1985–86. W 7:30–9:50 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 organizations are detailed, as are the present-day relationships of tribal governments to federal and state governments.]

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. Staff. Students must submit written proposals by the third week of the semester of their senior year to H. R. Capener, departmental honors committee representative.

[405 Agriculture, Society, and Biotechnology (also Biology and Sociology 408) Spring. 3 credits. Prerequisites: two courses in the social sciences and three courses in the biological or agricultural sciences. Not offered 1985–86. W 1:25–4:25. F. H. Buttel. An examination of the socio-ecological 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.]

[432 Community Development Fall. 3 credits. Not offered 1985–86. TR 10:10–11:30. J. C. Preston. Examines the major concepts, trends, and issues in community development and the role of the community-development change agent. Topics examined include community, community change, community action, community conflict, community leadership, citizen involvement, and strategies and tactics for planned community change.]

436 Small Communities: Structure and Change Spring. 3 credits. Prerequisite: Rural Sociology 101, 102, or 105. M W F 12:20–2:25. P. R. Ebers. The rural population turnaround has caused a resurgence in small-town attractiveness. This course examines this historic shift in terms of the spread of high-technology industry, the transformation of small-town economics, politics, human services, education, communication, and the future of quality of life in nonmetropolitan America.

437 Aging: Issues in the 1980s (also Sociology 347) Summer, 3-week session. 3 credits. M T W F R 11:15–1:15. P. Saetz. An analysis of the impact of social policies on the older person's freedom and independence. Older persons and their interactions with their environments are studied under the topics of community, neighborhood, the domicile, planned housing, and institutions. Attention is given to the formal and informal networks of services that help to maintain independent living arrangements by the elderly. Rural-urban differences in service availability and accessibility are considered.
440 The Social Impact of Rapid Resource Development Spring. 3 credits. T 7–10 p.m. C. Geisler. 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 constituencies, especially American Indians. Students will learn certain practical research skills needed in designing 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. R 1:25–4:30; additional sessions to be arranged. S. Sarbayaz. 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.

445 Rural Social Stratification Spring. 3 credits. Letter grade only. T R 9:05–10:35. P. Garrett. 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). Students must attach to their course enrollment material written permission from the faculty member who will supervise the work and assign the grade. S-U grades optional. States. 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. F. W. Young. A review of theory, empirical studies, and policy prescriptions as applied to communities and regions, especially in developing countries. Social ecology, central place theory, the Weberian tradition, dependency/political economy, and structural theory are compared.

[618 Research Design Fall. 4 credits. Not offered 1985–86. 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 study). This course discusses problems of measurement, the design of measuring instruments, and problems of reliability and validity. Some common forms of measuring instruments are discussed. O, Course concludes with an introduction to factor analysis.]

[619 Research Design II Spring. 4 credits. Prerequisite: an introductory methods course and a statistics course. Not offered 1985–86. T R 1:25–3:30; lab to be arranged. J. D. Francis. The second part of the sequence in introductory graduate level research methods with principles of design, especially nonexperimental designs. An intermediate-level treatment of the following topics: regression and analysis, 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.]

625 Gender Relations and Social Transformation Fall. 3 credits. T R 1:25–3:30. S. Feldman. A comparative analysis of women's contribution to domestic/household, 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.

[641 Politics and Economics of Rural and Regional Development Spring. 3 credits. Limited to upperclass or graduate students. S-U grades optional. Not offered 1985–86. M 12:20–2:50 plus 1 hour to be arranged. P. R. Ebets. 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 developing and developed societies.]

[642 Regional Systems and Policy Analysis Spring. 3 credits. Prerequisites: a social or economic theory course and statistics, or permission of instructor. S-U grades optional. Not offered 1985–86. Lec, F 2:20–4:00; rec and P. R. Ebets. A systems analysis of theoretical and research problems arising from localities' 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.]

650 Social Organization of Agriculture Fall. 3 credits. W 1:25–4:25. B. Galecki. Concerned with a 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 structures, methods of cooperation, small farmers, labor problems, and information networks. Ecological and physical constraints on production. Emphasis on the influence of national and international structures—political, social, and 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.

[651 Structural Change in United States Agriculture Fall. 3 credits. Not offered 1985–86. T R 1:25–4:25 F. H. Buttel. 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.]

675 The Politics of Policy, Planning, and Evaluation Fall. 3 credits. W 1:25–4:25. S. Feldman. 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, and the role of the international community 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. Not offered 1985–86. 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 debate on the nature of the state, theories of crisis in advanced capitalism (SIA and postmodernist critique), and the impact of these issues on the study of the state. Students will be required to attend seminars focusing on the problems of unequal exchange, dependency, and imperialism in the world system.]

710 Problem Formulation and Design for Field Research Spring. 3 credits. Letter grade only. R 3:35. P. Garrett. A graduate seminar dealing with the design of field research, specifically the articulation of theory and method. Readings are selected to be oriented around one of several research orientations and methodological techniques. Readings focus on the peasant-economy literature. Students explore theoretical issues and methodological alternatives applicable to their own research.

[712 Factor Analysis and Multidimensional Scaling Fall. 4 credits. Prerequisite: previous course work in scaling and multivariate analysis (factor analysis and multidimensional scaling). This course covers factor analysis, using the Philosophy of factor analysis, factor-analysis models, factor-defining factorization techniques and, comparison with factor-analysis models. Multidimensional scaling and discriminant analysis are also discussed. As matrix algebra is an integral part of these procedures, class time is devoted to this topic.]

717 Regression and Path Analysis Spring. 4 credits. Prerequisite: two courses in statistics and one in methods. T R 1:25–3:30. J. D. Francis. The first part of the course reviews simple and multiple regression analysis. Then extensions of these models are discussed. 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.

721 Ecological Perspectives on Social Change Spring. 3 credits. Hours to be arranged. E. W. Coward, Jr., F. H. Buttel. Reviews major theoretical traditions in the analysis of social change between changing property forms and community strategies, as well as shifts in the regional ethnic/class system.

[723 Social Movements in Agrarian Society Spring. 3 credits. Not offered 1985–86. W 1:25–4. F. W. Young. The seminar moves from a critical review of current research on peasant movements (classical, economic, structuralist) to a research practicum focused on ethnoregional movements, illustrating the possibilities of comparative research based on descriptive economic-institutional models and associated with agricultural and industrial change, as well as shifts in the regional ethnic/class system.]

[730 Community and Changing Property Institutions Spring. 3 credits. Not offered 1985–86. W 7–10 p.m. C. C. Geisler. The seminar acquaints students with the evolution of property rights beginning in antiquity and with the current political and ethical debate regarding the role of government in the regulation of property and community types as recognized by sociologists, both classical and contemporary. Readings will cover subjects such as land reform, the changing public interest in land-use regulation, and the "new feudalism" debate.]

72 Agriculture and Life Sciences
741 Community Development and Local Control
Spring. 3 credits. Not offered 1985–86.
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 theories include the role of neopopulism in community development, changing institutions of property as community development occurs, and changing definitions of community.

751 Applications of Sociology to Development Programs
Fall. 3 credits.
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 754 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. Examinations. Irrigated agriculture and its relation to agricultural production. 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.

871–874 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.

871 Rural Sociology

872 Development Sociology

873 Organization Behavior and Social Action

874 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.

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 9:05. Prereqs: weeks 6 and 11. S. J. Schwager.
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 experimentation and design, measurement, tables, graphs, measures of center and spread, probability, the normal curve, confidence intervals, and statistical tests.

408 Theory of Probability
Fall. 4 credits.
Prerequisite: Mathematics 106, 108, or 112, or permission of instructor.
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 1–7. 2 credits.
Prerequisite: precalculus mathematics. Dropping the course is not permitted after Sept. 20.
Definitions, basic operations and arithmetic, determinants, and the inverse matrix. Emphasis is on understanding basic ideas.

417 Matrix Algebra II
Fall, weeks 8–14. 2 credits.
Prerequisite: Statistics 416 or permission of instructor.
No auditors. Dropping the course is not permitted after Nov. 9.
Rank, linear dependence, canonical forms, linear equations, generalized inverses, and characteristic roots and vectors. Emphasis is on developing skills for applying matrix algebra.

496 Statistical Consulting
Fall. 2 credits. Limited to undergraduates.
Prerequisites: Statistics 409 and 602 and permission of instructor.
Lec, W 1:25–2:15 plus one hour of consulting to be arranged. D. S. Robson.
Participation in the Biometrics Unit consulting service: faculty-supervised statistical consulting with researchers from other disciplines. Discussion sessions for joint consideration of selected consultations encountered during previous weeks.

498 Supervised Teaching
Spring. 2 credits.
Limited to statistics and biometry undergraduates.
Prerequisites: permission of faculty member directing research.
Staff.

500 Statistics Seminar
Fall or spring. 1 credit. S-U grades only.
W 3. Staff.

601 Statistical Methods I
Fall. 4 credits. Limited to graduate students; others by permission of the instructor.
Statistical methods are developed and used to analyze data arising from a wide variety of applications. Topics include descriptive statistics, point and interval estimation, hypothesis testing, inference for a single population, comparisons between two populations, one- and two-way analysis of variance, comparison among population means, analysis of categorical data and correlation and regression analysis. Interactive computing is introduced through the MINITAB statistical computing system. Emphasis is on basic principles and criteria for selection of statistical techniques.

602 Statistical Methods II
Spring. 4 credits.
Limited to graduate students; others by permission of instructor.
Prerequisite: Statistics 601 or equivalent.
Lecs, M W F 9:05 or 11:15; lab, M 12:20–1:25 or 2:30–4:25 (two sections), or T 10:10–12:05 or 12:20–2:15. F. B. Cady.
A continuation of Statistics 601. Emphasis on (1) data analysis and inference for a wide variety of research situations using standard multiple regression programs and (2) design of experiments. Case studies and hands-on computing using the SAS statistical computing package. Topics include estimating and interpreting sequential and partial coefficients, sums of squares, prediction, residual plotting, model building, estimation of standard errors, principles and practice of randomization, replication and blocking, analysis of sample means from one-way and multiway classifications, factorial experiments, estimation of contrasts, covariance analysis, comparison of regression lines, model (variable) selection with many predictor variables, split plot experiments, nested models, and variance component models, combining contingency tables, and application to case control studies; multivariate analysis; and space-time clustering.

603 Statistical Methods III
Fall. 3 credits.
Prerequisite: Statistics 601 and 602 or permission of instructor. Offered if sufficient number of students are interested.
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.

605 Applied Regression Analysis
Fall. 1 credit.

606 Sampling Biological Populations
Fall. 1 credit.
Prerequisite: Statistics 601 or equivalent. Offered alternate years. Not offered 1985–86.
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.
74 Agriculture and Life Sciences

607 Nonparametric and Distribution-Free Statistical Methods  Spring, \( \frac{1}{2} \) of the term, 1 credit. Prerequisite: Statistics 601 or equivalent. Lecs, M W F 12:20, G. C. Casella. Nonparametric and distribution-free alternatives to normal-theory testing procedures are presented: randomization tests; location and scale tests for two populations; analyses for completely randomized, randomized blocks, and balanced incomplete block designs; comparisons among several means; correlation and regression; and goodness-of-fit.

[662] Mathematical Ecology (also Biological Sciences 662) Spring, 3 credits. Prerequisites: a year of calculus and a course in probability. Offered alternate years. Not offered 1985–86. 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, principles and techniques, and simulation and analytical techniques.

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. Lecs, T R 1:25, D. S. Robson. Bioassay methods, including parametric and nonparametric statistical analyses of quantal and graded response to controlled levels of single and multifactor stimuli; directional statistics as applied to animal orientation experiments; compartment models and analyses; econometrics 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. Lecs, T R 8–9:50, W. T. Federer. Principles of experimentation, theoretical concepts, extensions and variations of the completely randomized, randomized 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 years. Not offered 1985–86. 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, designs derivable 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. Lecs and disc to be arranged. S. H. Searle. Introduction to the concepts and distributions of quadratic forms; linear statistical models, estimable functions and testable hypotheses, regression models, experimental design models, and variance component models and combinations thereof.

799 Statistical Consulting Fall, 2 credits. Limited to graduate students. Lec, W 1:25–2:55 plus 1 hour of consulting to be arranged. D. S. Robson. Participation in the Biometrics Unit consulting service, faculty-supervised statistical consulting with researchers from other disciplines. Discussion sessions for joint consideration of selected consultations encountered by the service during previous weeks.

890 Research Fall or spring. Credit to be arranged. Limited to candidates for graduate degrees. Prerequisites: permission of the graduate field member concerned. S-U grades only. Research at the M.S. level.

900 Research Fall or spring. Credit to be arranged. Limited to candidates for graduate degrees. Prerequisites: permission of the graduate field member concerned. S-U grades only. Research at the Ph.D. level.

Vegetable Crops


103 General Horticulture Spring, 4 credits. Each lab limited to 26 students. Lecs, M W F, lab; T W 2–4:25, L. D. Topoleski. Acquaints the student with applied and basic horticulture. Primarily for students who want a general knowledge of the subject or who want to specialize in 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. T or W 1:25–4:25, W. C. Kelly. Students must be prepared to lead a discussion and write a paper on some aspect of home gardening or amateur horticulture. Organic methods of gardening are discussed and demonstrated, but other methods are not excluded from the discussions.

210 Vegetable Types and Identification Fall, 2 credits. Lecs, M W F 10:10–12:05 or 2:4–4:25, L. D. Topoleski. Acquaints the student with the vegetable species grown in the Northeast and the pests and disorders encountered in their production. Subjects covered include identification of economically destructive weeds, diseases and insects of vegetables, identification of vegetable and weed seeds, seedlings, nutrient deficiencies, vegetable judging, grading, and grade defects.

211 Commercial Vegetable Crops Fall, 4 credits. Each section limited to 25 students. Prerequisites: Vegetable Crops 603 and Agronomy 200. Field trip fee, not more than $20. Lecs, M W F 11:15, lab, W or F 2:45–4:25; 1 S field trip, 3 field trips (Sept.), W 11:15–6, L. A. Ellerbrock. Intended for those interested in commercial vegetable industry from the viewpoint of production, processing, marketing, or the related service industries. Topics included are techniques, problems, trends and changes in the vegetable industry, and marketing and storage of the major vegetable crops, including potatoes.

319 Fundamentals of Postharvest Physiology, Handling, and Storage of Horticultural Crops (also Agricultural Engineering 319 and Pomology 319) Fall, 3 credits. Prerequisite: A course in horticulture, pomology, or vegetable crops or permission of instructor.

Lecs, M W 9:05; lab, F 1:25–3:55, F. W. Liu, J. R. Hicks, J. A. Bartsch. The physiology—transpiration, respiration, ethylene synthesis and action, evaporation, ripening, and senescence—of fruits, vegetables, flowers, and ornamental crops is studied. Environmental factors influencing the physiological process, thus affecting the quality and marketability of the products, are considered. The principles and methods of harvesting, cleaning, grading, packing, precoding, waxing, sanitization, 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 Vegetables Fall, weeks 8–10. 1 credit. Prerequisite: Vegetable Crops/Agricultural Engineering/Al. 9:05; lab, T 1:25–3:55. J. R. Hicks. Studies of maturity indices, preharvest treatments and harvesting, handling, storage, and transportation requirements and practices of important vegetables.

322 Quality of Horticultural Crops during Marketing Spring, weeks 10–14. 1 credit. Prerequisite: Vegetable Crops/Agricultural Engineering/Al. 9:05; lab, T 1:25–3:55 (tentative). J. R. Hicks. A study of physical and physiological changes of horticultural crops and how quality is modified during marketing. Emphasis will be placed on how the following regulations and market practices influence the ultimate quality: marketing orders, marketing chain, market requirements, quarantine and pest eradication procedures, and the Perishable Agricultural Commodities Act.

401 Vegetable Crop Physiology Fall. 5 credits. Prerequisites: Vegetable Crops 211 and Biological Sciences 242. Lecs, M W 11:15; lab, M 2:45–4:25, disc, R or F 1:25, or 3. H. C. Wien, P. L. Minotti. Subjects include mineral nutrition as influenced by fertilization programs and crop sequence, nutrient interactions and induced deficiencies, growth and development, flowering, fruit setting, growth correlation, senescence, sex expression, 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 2:45–4:25, Staff. 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, M W F 12:20, G. C. Casella, 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 and the effects of 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 enrollment. Hours arranged with staff. Special problems may be elected in any line of vegetable work.
Apagar, Barbara J., Ph.D., Cornell U. Asst. Prof., Animal Science
Agrin, Richard D., Ph.D., Cornell U. Prof., Agricultural Economics
Amesnow, Phil A., Ph.D., U. of Wisconsin. Assoc. Prof., Plant Pathology
Austic, Richard E., Ph.D., U. of California at Davis. Assoc. Prof., Agricultural Economics
Awa, Njoku E., Ph.D., Cornell U. Assoc. Prof., Communication Arts
Baer, Richard A., Ph.D., Harvard U. Prof., Natural Resources
Bailey, Joe P., Ph.D., Michigan State U. Prof., Education
Baker, Robert C., Ph.D., Purdue U. Prof., Poultry and Avian Sciences
Bandler, David K., M.P.S., Cornell U. Assoc. Prof., Food Science
Barbaro, David M., Ph.D., Cornell U. Asst. Prof., Food Science
Barker, Randolph, Ph.D., Iowa State U. Prof., Agricultural Economics
Barrett, Milton L., Ph.D., Cornell U. Prof., Rural Sociology
Bartch, James A., Ph.D., Purdue U. Assoc. Prof., Agricultural Engineering
Bauman, Dale E., Ph.D., U. of Illinois. Prof., Animal Sciences
Beer, Steven V. Ph.D., U. of California at Davis. Assoc. Prof., Plant Pathology
Beermann, Donald H., Ph.D., U. of Wisconsin. Assoc. Prof., Animal Sciences
Bell, Alan W., Ph.D., U. of Glasgow (Scotland). Asst. Prof., Animal Science
Bellinder, William R., Ph.D., Virginia Polytechnic Inst. and State University. Assoc. Prof., Agronomy
Bergstrom, Gary C., Ph.D., U. of Kentucky. Asst. Prof., Plant Pathology
Berkey, Arthur L., Ph.D., Michigan State U. Prof., Education
Bills, Nelson L., Ph.D., Washington State U. Assoc. Prof., Agricultural Economics
Blandford, David D., Ph.D., Manchester U. Assoc. Prof., Agricultural Economics
Blanpied, George D., Ph.D., Michigan State U. Prof., Pomology
Bloom, Stephen E., Ph.D., Penn State U. Prof., Poultry and Avian Sciences
Boeke, K. Richard N., Ph.D., U. of Minnesota. Prof., Agricultural Economics
Bouldin, David R., Ph.D., Iowa State U. Prof., Agronomy
Bourke, John B., Ph.D., Oregon State U. Prof., Food Science and Technology (Geneva)
Bourne, Malcolm C., Ph.D., U. of California at Davis. Prof., Food Science and Technology (Geneva)
Boyd, R. Dean, Ph.D., U. of Nebraska. Assoc. Prof., Animal Sciences
Brady, John W., Jr., Ph.D., SUNY at Stonybrook. Asst. Prof., Food Science
Brahe, John R., Ph.D., North Carolina State U. W. I. Myers Professor of Agricultural Finance, Agricultural Economics
Broadwell, George J., Ph.D., Cornell U. Assoc. Prof., Cooperative Extension
Brodie, Bill B., Ph.D., North Carolina State U. Prof., Plant Pathology
Brown, William J., Jr., Ph.D., Harvard U. Prof., Entomology
Bruce, Robert L., Ph.D., Cornell U. Prof., Education
Brunet, Harlan B., Ph.D., Cornell U. Assoc. Prof., Natural Resources
Bryan, Ray B., Ph.D., Purdue U. Asst. Prof., Agronomy
Bugliari, Joseph B., LL.B., Cornell U. Prof., Agricultural Economics
Burr, Thomas J., Ph.D., U. of California at Berkeley. Assoc. Prof., Plant Pathology (Geneva)
Butler, Walter R., Ph.D., Purdue U. Assoc. Prof., Animal Sciences
Buttel, Frederick H., Ph.D., U. of Wisconsin. Assoc. Prof., Rural Sociology
Call, David L., Ph.D., Cornell U. Prof., Agricultural Economics
Campbell, Joseph K., M.S., Cornell U. Prof., Agricultural Engineering
Capener, Harold R., Ph.D., Cornell U. Prof., Rural Sociology
Carruthers, Raymond J., Ph.D., Michigan State U. Asst. Prof., Animal Economics
Casella, George, Ph.D., Purdue U. Assoc. Prof., Plant Breeding and Biometry
Caster, George L., Ph.D., Purdue U. Prof., Agricultural Economics
Chapman, Lewis D., Ph.D., U. of California at Berkeley. Prof., Agricultural Economics
Chase, Larry E., Ph.D., Penn State U. Assoc. Prof., Animal Economics
Cofer, William R., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
Colle, Royal D., Ph.D., Cornell U. Prof., Communication Arts
Combs, Gerald F., Jr., Ph.D., Cornell U. Assoc. Prof., Poultry and Avian Sciences
Compton, James L., Ph.D., U. of Michigan. Assoc. Prof., Education
Confrey, John H., Ph.D., Cornell U. Assoc. Prof., Education
Conneman, George J., Ph.D., Penn State U. Prof., Agricultural Economics
Conrad, John M., Ph.D., U. of Wisconsin. Assoc. Prof., Agricultural Economics
Cooke, J. Robert, Ph.D., North Carolina State U. Prof., Agricultural Engineering
Cottrell, Thomas H., Ph.D., U. of Rochester Assoc. Prof., Food Science and Technology (Geneva)
Coward, E. Walter, Ph.D., Iowa State U. Prof., Rural Sociology
Cox, William J., Ph.D., Oregon State U. Asst. Prof., Agronomy
Cressey, Leroy L., Ph.D., U. of California at Davis. Prof., Pomology
Cummings, James N., Ph.D., Southern Illinois U. Prof., Horticultural Sciences (Geneva)
Cunningham, Danis L., Ph.D., Virginia Polytechnic Inst. Assoc. Prof., Poultry and Avian Sciences
Cupp, Eddie W., Ph.D., U. of Illinois. Assoc. Prof., Entomology
Curtin, W. Bruce, Ph.D., Macquarie U. Assoc. Prof., Animal Science
Cushman, Harold R., Ph.D., Cornell U. Prof., Education
Day, Lee M., Ph.D., U. of Minnesota. Prof., Agricultural Economics
Dennehy, Timothy J., Ph.D., U. of California at Davis. Asst. Prof., Entomology (Geneva)
Deslauriers, David, Ed.D., U. of California at Los Angeles. Assoc. Prof., Education
Dethier, Bernard E., Ph.D., Johns Hopkins U. Prof., Agronomy
deTurck, Mark A., Ph.D., Michigan State U. Asst. Prof., Communication Arts
Dietz, Robert S., Ph.D., U. of California at Berkeley. Prof., Plant Pathology
Dickson, Michael H., Ph.D., Michigan State U. Prof., Horticultural Sciences (Geneva)
Dietter, Rodney R., Ph.D., U. of Texas at Austin. Assoc. Prof., Poultry and Avian Sciences
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Dolan, Desmond D., Ph.D., Cornell U. Assoc. Prof., Horticultural Sciences (Geneva)
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Duke, William B., Ph.D., U. of Illinois. Prof., Agronomy
Dunn, James A., Ph.D., U. of Michigan. Prof., Education
Duxbury, John M., Ph.D., U. of Birmingham. Assoc. Prof., Agronomy
Earle, Elizabeth J., Ph.D., Harvard U. Assoc. Prof., Plant Breeding and Biometry
Eberts, Paul R., Ph.D., U. of Michigan. Assoc. Prof., Rural Sociology
Eckenrode, Charles J., Jr., Ph.D., U. of Wisconsin. Prof., Entomology (Geneva)
Egner, John A., Ed.D., Cornell U. Prof., Education
Eickwort, George C., Ph.D., U. of Kansas. Prof., Entomology
Eierbrock, LeRoy A., Ph.D., Cornell U. Assoc. Prof., Vegetable Crops
Faculty Roster 77

Mount, Timothy D., Ph.D., U. of California at Berkeley. Prof., Agricultural Economics
Mower, Robert G., Ph.D., Cornell U. Prof., Floriculture and Ornamental Horticulture
Mudge, Kenneth W., Ph.D., Washington State U. Asst. Prof., Floriculture and Ornamental Horticulture
Muka, Arthur A., Ph.D., Cornell U. Prof., Entomology
Mutschler, Martha, Ph.D., U. of Wisconsin. Assoc. Prof., Plant Breeding and Biometry
Neal, Joseph C., Ph.D., North Carolina State U. Asst. Prof., Floriculture and Ornamental Horticulture
Negri, Frank B., Ph.D., U. of California at Riverside. Asst. Prof., Floriculture and Ornamental Horticulture
Noble, Lucinda A., Ph.D., U. of North Carolina. Prof., Extension
Novak, Joseff D., Ph.D., U. of Minnesota. Prof., Education
Novakovic, Andrew M., Ph.D., Purdue U. Assoc. Prof., Agricultural Economics
Nyrop, Jan P., Ph.D., Michigan State U. Asst. Prof., Agronomy
Ostman, Ronald E., Ph.D., U. of Minnesota. Assoc. Prof., Animal Science
Ottencat, Elizabeth A., Ph.D., U. of Minnesota. Assoc. Prof., Animal Science
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Pearson, Roger C., Ph.D., U. of California at Davis. Assoc. Prof., Plant Pathology (Geneva)
Peck, Nathan H., Ph.D., Cornell U. Prof., Horticultural Sciences (Geneva)
Peckarsky, Barbara L., Ph.D., U. of Wisconsin. Assoc. Prof., Entomology
Petrovic, A. Martin, Ph.D., Michigan State U. Assoc. Prof., Floriculture and Ornamental Horticulture
Peyr, John D., Ph.D., U. of Illinois. Assoc. Prof., Agronomy
Philipson, Warren D., Cornell U. Assoc. Prof., Agronomy
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Smith, Charles R., Ph.D., Cornell U. Asst. Prof., Natural Resources
Smith, Richard D., Ph.D., Cornell U. Assoc. Prof., Animal Science
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Stover, James R., Ph.D., U. of Illinois. Prof., Animal Science
Strobl, Richard W., Ph.D., U. of Missouri. Assoc. Prof., Entomology (Geneva)
Strother, Kenneth A., Ph.D., Northwestern U. Prof., Education
Sutphin, H. Dean, Ph.D., Ohio State U. Asst. Prof., Education
Taubes, Maurice J., Ph.D., U. of California at Berkeley. Prof., Entomology
Tauer, Loren W., Ph.D., Iowa State U. Assoc. Prof., Agricultural Economics
Taylor, Alan G., Ph.D., Oklahoma State U. Asst. Prof., Horticultural Sciences (Geneva)
Tenney, Richard W., Ph.D., Penn State U. Asst. Prof., Education
Thomassy, Michael L., Ph.D., U. of Minnesota. Assoc. Prof., Animal Science
Thurston, H. David, Ph.D., U. of Minnesota. Prof., Plant Pathology
Timm, Michael B., Ph.D., Cornell U. Assoc. Prof., Agricultural Engineering
Tingley, Ward M., Ph.D., U. of Arizona. Assoc. Prof., Entomology
Tomek, William G., Ph.D., U. of Minnesota. Prof., Entomology
Topoleski, Leonard D., Ph.D., Purdue U. Assoc. Prof., Vegetable Crops
Trancic, Roger T., M.L.A., Harvard U. Assoc. Prof., Floriculture and Ornamental Horticulture
van Buren, Jerome P., Ph.D., Cornell U. Prof., Food Science and Technology (Geneva)
van Campen, Darrell R., Ph.D., North Carolina State U. Assoc. Prof., Animal Science
van Demark, Paul J., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
van Etten, Hans D., Ph.D., Cornell U. Prof., Entomology
van Tienhoven, Ari, Ph.D., U. of Illinois. Prof., Poultry and Avian Sciences
van Vleck, L. Dale, Ph.D., Cornell U. Prof., Animal Science
van Wambeke, Armand R., Ph.D., U. of Ghent
van Wagoner, Robert J., Ph.D., U. of California at Davis. Assoc. Prof., Agronomy
vanWagten, Charles J., Ph.D., Cornell U. Prof., Animal Science
Vanek, Marika, Ph.D., U. of Wisconsin. Prof., Entomology
van Eten, Hans D., Ph.D., Cornell U. Prof., Plant Pathology
van Tienhoven, Ari, Ph.D., U. of Illinois. Prof., Poultry and Avian Sciences
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Walker, Larry P., Ph.D., Michigan State U. Assoc. Prof., Agricultural Engineering
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Wallace, Michael F., Ph.D., U. of Wisconsin. Assoc. Prof., Agricultural Engineering
Wallace, Reginald H., Ph.D., U. of Massachusetts. Assoc. Prof., Food Science and Technology (Geneva)
Ward, William B., M.S., U. of Wisconsin. Prof., Communication Arts
Wardeberg, Helen L., Ph.D., U. of Minnesota. Prof., Education
Warner, Richard G., Ph.D., Cornell U. Prof., Animal Science
Webster, Dwight A., Ph.D., Cornell U. Prof., Natural Resources
Weeden, Norman F., Ph.D., U. of California at Davis. Asst. Prof., Horticultural Sciences (Geneva)
Weiler, Thomas C., Ph.D., Cornell. Assoc. Prof., Floriculture and Ornamental Horticulture
Weires, Richard W., Ph.D., U. of Minnesota. Assoc. Prof., Entomology (Geneva)
Welch, Ross M., Ph.D., U. of California at Davis. Asst. Prof., Agronomy
Webber, Quentin D., Ph.D., Ohio State U. Asst. Prof., Entomology
White, Gerald B., Ph.D., Penn State U. Assoc. Prof., Agricultural Economics
White, Shirley A., Ph.D., Michigan State U. Prof., Communication Arts
Wien, Hans C., Ph.D., Cornell U. Assoc. Prof., Vegetable Crops
Wilcox, Darlene, Ph.D., U. of Florida. Asst. Prof., Vegetable Crops
Wilcox, Wayne F., Ph.D., U. of California at Davis. Asst. Prof., Plant Pathology (Geneva)
Wilkins, Bruce T., Ph.D., Cornell U. Prof., Natural Resources
Wilkinson, Christopher F., Ph.D., U. of California at Riverside. Prof., Entomology
Wing, Kenneth E., Ph.D., Cornell U. Prof., Agriculture
Wolfe, David W., Ph.D., U. of California at Davis. Asst. Prof., Vegetable Crops
Wright, Madison J., Ph.D., U. of Wisconsin. Prof., Agronomy
Yarbrough, J. Paul, Ph.D., Iowa State U. Prof., Communication Arts
Yoder, Glen C., Ph.D., Michigan State U. Prof., Plant Pathology
Young, Frank W., Ph.D., Cornell U. Prof., Rural Sociology
Young, Roger G., Ph.D., U. of Oregon. Assoc. Prof., Entomology
Youngs, William F., Ph.D., Cornell U. Prof., Natural Resources
Zaitlin, Milton, Ph.D., U. of California at Los Angeles. Prof., Plant Pathology
Zall, Robert R., Ph.D., Cornell U. Prof., Food Science
Zinder, Stephen H., Ph.D., U. of Wisconsin. Asst. Prof., Microbiology
Ziter, Thomas A., Ph.D., Michigan State U. Assoc. Prof., Plant Pathology
Zobel, Richard W., Ph.D., U. of California at Davis. Assoc. Prof., Plant Breeding and Biometry/ Agronomy
Züiches, James J., Ph.D., U. of Wisconsin. Prof., Rural Sociology
College of Architecture, Art, and Planning

Administration

William G. McMinn, dean
Jack Squier, acting associate dean
Michael Whalen, director of administrative services
Ellen McColister, director of external affairs
Thomas Fowler, director of minority educational affairs
M. Sophie Newhart, registrar
Elizabeth A. Cutter, admissions coordinator
Betty Gangle, accountant
Margaret Webster, slide curator

Faculty Advisers

Freshmen are assigned faculty advisers for their first year and are also invited to share their concerns and seek advice from the volunteer student advisers at any time.

Upperclass students have no regular assigned advisers and are free to seek assistance and advice from the most appropriate faculty member or college officer.

Specific inquiries regarding rules, procedures, or deadlines should be addressed to:

M. Sophie Newhart, registrar
Thomas Fowler, director of minority educational affairs
Jerry A. Wells, chairman, Department of Architecture
Stanley J. Bowman, chairman, Department of Art
William Goldsmith, chairman, Department of City and Regional Planning

Degree Programs

<table>
<thead>
<tr>
<th>Degree Programs</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>B.Arch.</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>B.F.A.</td>
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<tr>
<td>History of Architecture and</td>
<td></td>
</tr>
<tr>
<td>Urban Development</td>
<td>B.S.</td>
</tr>
<tr>
<td>Urban and Regional Studies</td>
<td>B.S.</td>
</tr>
</tbody>
</table>

The college offers programs leading to the bachelor’s degree—the five-year program in architecture leads to the Bachelor of Architecture; four-year programs in art and architecture lead to the Bachelor of Fine Arts. In addition, a two-year transfer program at the junior and senior level or four-year program with a concentration in urban and regional studies leads to the Bachelor of Science.

Graduate-level programs are offered in art, architectural design and urban and regional design, architectural sciences, history of architecture and urban development, preservation planning, city and regional planning, regional science, and landscape architecture.

Students in each of these programs work in physical proximity to one another and thus gain a broader understanding of their own special area of interest through contact with the students and faculty in other disciplines.

Early in its development the college set a limit on the number of students it would enroll and devised a selective method of admission. There are now more than 650 students and a full-time teaching staff of over fifty-five, supplemented by visiting professors and critics, part-time lecturers, and assistants. Teachers and students mix freely, and much instruction and criticism is on an individual basis.

The college’s courses are integral parts of the professional curricula. Fundamental subjects are taught by faculty members whose experience provides them with professional points of view. The concentration 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 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. Lillian P. Heller, the college occupied 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 150,000 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, designated 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 a 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 is 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 those 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 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 characteristics of urban development within the framework of a design studio. Content concentrates on urban design issues, constraints 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 field secretary for architecture. Students accepted into substitute Arch 601–602 for Arch 501–502. At the spring term, 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 department. Some students are then able to complete the requirements for the master's degree in one additional year.

**Curriculum**

**First Year**

<table>
<thead>
<tr>
<th>Term</th>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall Term</td>
<td>101 Design I</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>181 History I</td>
<td>3</td>
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<tr>
<td></td>
<td>151 Drawing I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>121 Mathematical Techniques</td>
<td>3</td>
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<tr>
<td></td>
<td>Out-of-college elective (Freshman Seminar)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17</td>
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<tr>
<td>Spring Term</td>
<td>102 Design II</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>182 History of Architecture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>152 Drawing II</td>
<td>2</td>
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<td></td>
<td>122 Structural Concepts</td>
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<tr>
<td></td>
<td>Out-of-college elective</td>
<td>3</td>
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**Second Year**

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<thead>
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<tr>
<td>Fall Term</td>
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</tr>
<tr>
<td></td>
<td>221 Structural Systems I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>231 Architectural Elements and Principles</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>261 Site Planning</td>
<td>3</td>
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<td></td>
<td>Out-of-college elective</td>
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</tr>
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<td></td>
<td></td>
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<tr>
<td>Spring Term</td>
<td>202 Design IV</td>
<td>6</td>
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<tr>
<td></td>
<td>222 Structural Systems II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>232 Design Methods and Programming</td>
<td>2</td>
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<td></td>
<td>262 Building Technology, Materials, and Methods</td>
<td>3</td>
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<td>College elective</td>
<td>3</td>
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**Third Year**

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<thead>
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<th>Term</th>
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<tbody>
<tr>
<td>Fall Term</td>
<td>301 Design V</td>
<td>6</td>
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<tr>
<td></td>
<td>361 Environmental Controls I—Lighting and Acoustics</td>
<td>3</td>
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<td>Departmental elective</td>
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<td>Out-of-college elective</td>
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<td></td>
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<tr>
<td>Spring Term</td>
<td>302 Design II</td>
<td>6</td>
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<tr>
<td></td>
<td>362 Environmental Controls II—Mechanical and Passive Solar Systems</td>
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**Fourth Year**

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<tr>
<td>Fall Term</td>
<td>401 Design VII</td>
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<tr>
<td></td>
<td>461 Professional Practice</td>
<td>3</td>
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<td>Departmental elective</td>
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<td>College elective</td>
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<td>Spring Term</td>
<td>402 Design VIII</td>
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**Fifth Year**

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<tr>
<th>Term</th>
<th>Course</th>
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<tbody>
<tr>
<td>Fall Term</td>
<td>501 Design IX</td>
<td>6</td>
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<td>Departmental elective</td>
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<td></td>
<td>Out-of-college elective</td>
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<td>Out-of-college elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Spring Term</td>
<td>502 Design or</td>
<td>8</td>
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<tr>
<td></td>
<td>504 Design X Thesis or</td>
<td></td>
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<tr>
<td></td>
<td>602 or 604 Special Program</td>
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<td>Departmental elective</td>
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<td>College or out-of-college elective</td>
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**Required Departmental Courses**

<table>
<thead>
<tr>
<th>Term Subject</th>
<th>Course Number</th>
<th>Credits</th>
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<tr>
<td>design</td>
<td>101–504</td>
<td>62</td>
</tr>
<tr>
<td>mathematics</td>
<td>121 or approved elective</td>
<td>3</td>
</tr>
<tr>
<td>structures</td>
<td>221, 222, 222</td>
<td>10</td>
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<tr>
<td>technology</td>
<td>261, 262, 361, 362</td>
<td>12</td>
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<tr>
<td>architectural principles, theories, and methods</td>
<td>231, 232</td>
<td>4</td>
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<tr>
<td>history of architecture</td>
<td>181, 182</td>
<td>6</td>
</tr>
<tr>
<td>professional practice</td>
<td>461</td>
<td>3</td>
</tr>
<tr>
<td>drawing</td>
<td>151, 152</td>
<td>4</td>
</tr>
<tr>
<td>Free</td>
<td>15 credits</td>
<td>15</td>
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</table>

**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-terms 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...
case is considered individually. Transfer students must complete a minimum of 70 credits and four terms in residence, taking 56 of the 70 credits (including four terms of design) in the Department of Architecture. Placement in the design sequence is based on a review of a representative portfolio of previous work.

### 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 183, which is available for the fall semester) are required for students with no previous studio work.

### Procedure

Students from Cornell who want to transfer to the program may do so at the beginning of the fall term of their third or fourth year of study. They submit a short application as prospective internal transfer students. It is crucial that, before applying, all prospective internal transfer students meet with a history of architecture faculty member to discuss procedural matters and program content.

Students who want to transfer to the program from outside Cornell must apply to the Department of Architecture by March 15. Applications can be considered after this date, but are given lower priority. Applications for both internal and external transfer students are available from Elizabeth Cutter, Admissions Office, College of Architecture, Art, and Planning, Cornell University, 135 East Sibley Hall, Ithaca, New York 14853-6701.

### Curriculum

A student entering the program selects an adviser from the history of architecture faculty in the Department of Architecture. Adviser and student together prepare an appropriate two-year course of study according to the following guidelines:

1. 29 credits of 300-level courses in architectural history: Arch 381, 382, 384, 385, 387, 388, 390, 391, and 393
2. 12 credits in 600-level architectural history seminars: Arch 681 through Arch 690; or 8 credits in a 600-level seminar plus Arch 490, offered for honors candidates only
3. 24 credits in electives selected in consultation with the student's adviser
4. Language requirement, to be met in the manner specified for students enrolled in the College of Arts and Sciences

### Honors program

Students will graduate with honors if, during their two years of study in the program, they have a cumulative average of B or better in all courses, have no grade lower than A− in all history of architecture courses taken at the 300 level, and have completed an honors thesis (Arch 490) deemed to be of distinguished quality by the history of architecture faculty.

### Dual Degree Options

Students can earn both the B.S. and B.Arch. degrees either simultaneously or sequentially. Students who have transferred into the B.Arch. program at Cornell may find this to be a special opportunity for an enlarged and enriched program of study. Ordinarily this option requires five years of study and assumes the satisfactory fulfillment of requirements in both the B.S. and B.Arch. programs.

Students currently enrolled in the College of Arts and Sciences at Cornell can earn a B.A. in an arts college major and a B.S. in the history of architecture in five years. In this option, students complete a minimum of 150 credits, which includes the B.S. prerequisites and curriculum requirements and 100 credits of the usual distribution and major requirements in the College of Arts and Sciences. Further information about this option is available at the Admissions Office, 135 East Sibley Hall, and at the Academic Advising Center of the College of Arts and Sciences, 55 Goldsmith Smith Hall.

Students may also elect to continue toward a Master of Arts degree in the history of architecture. The M.A. ordinarily requires a minimum of two years of graduate work beyond the bachelor's degree; with this special sequential degree arrangement, that time is shortened by approximately one year.

### Summer Term in Architecture

The summer term offers students the opportunity of a concentrated period of design work. Design is offered at both undergraduate and graduate levels; the term is six to eight weeks in duration.

Undergraduate design sequence courses, including theory, are offered at first- through fifth-year levels in Ithaca. Normally there is also a design program abroad for third-, fourth-, and fifth-year students.

Students from schools of architecture other than Cornell are welcome to apply to the college for admission to any summer programs.

At the graduate level, the summer term is devoted to problems forming part of the student's program of work. The term may carry graduate credit equal to that of a normal academic term. Participation in the program cannot be undertaken without the consent of the student’s Special Committee.

### Architectural Design Courses

Numbers in parenthesis are old course numbers. Courses in brackets are not offered this year.

A studio fee of $10 is charged each semester for every design course (these fees are subject to change).

### Elective Design Courses

103–104 (111–112) Elective Design Studio 103, fall; 104, spring. 6 credits each term. Limited to students from outside the department. Prerequisite: permission of instructor.

503–504 Design IX—Thesis I, and Design X—Thesis II Fall and spring. 6 credits each term. Prerequisite: permission of department. Students, hours to be arranged. Staff.

### Sequence Courses

101 Design I Fall. 6 credits. Limited to department students.

102 Design II Spring. 6 credits. Limited to department students. A continuation of Architecture 101.

401–402 Design VII and VIII Fall and spring. 6 credits each term. Limited to department students.

501 Design IX Fall or spring. 6 credits. Limited to department students.

503–504 Design IX—Thesis I, and Design X—Thesis II Fall or spring. 8 credits each term. Prerequisite: permission of department. Students, hours to be arranged. Staff.

510 Thesis Introduction Foreign summer programs and Washington program only. 3 credits. Must be taken in conjunction with Architecture 500. Architecture 500 will be considered equivalent to Architecture 501 when taken concurrently with Architecture 510 during a foreign summer program or in Washington. Lectures and seminars. Staff.

501–602 Special Program in Architectural Design Fall and spring. 9 credits each term. Limited to students who have been accepted into the Overlap Program. Registration by petition only.

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.
Graduate Courses

701–702 (711–712) Problems in Architectural Design Fall and spring. 9 credits each term. Studio and seminar, hours to be arranged. W. Goehner. 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 seminar, 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.

802 (812) Thesis or Research in Urban Design Fall or spring. 9 credits. Hours to be arranged. C. Rowe and staff.

Structures Courses

121 (221) Mathematical Techniques Fall. 3 credits. Lecs, TR 10:10–11:10. Staff. Mathematical concepts and operations used in architecture are introduced.

122 (222) Structural Concepts Fall or spring. 4 credits. Prerequisite: Architecture 121 or approved equivalent. Lecs and seminars, TR 9:05–9:55. Staff. Fundamental concepts of structural behavior. Statics and strength of materials.

221 (321) Structural Systems I Fall. 3 credits. Prerequisites: Architecture 121 and 122. Lecs and studio, TR 11:15–1:10. Staff. Structural design concepts and procedures for steel building construction.

222 (322) Structural Systems II Spring. 3 credits. Prerequisite: Architecture 122. TR 11:15–1:10. Staff. Structural design concepts and procedures for reinforced concrete building construction.

326 Building Substructure Spring. 3 credits. Prerequisites: Architecture 222 or concurrent registration and permission of instructor. Not offered every year. Seminar, 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. 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. Studies and lectures, M W 1:30–3:25. 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. Studies and lectures, T 1:30–3:25. W. Goehner. 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. Independent study.

335 Theory of Architecture Fall. 3 credits. Prerequisite: Architecture 231–232 or permission of instructor. Not offered every year. Lectures, TR 4:40–6:30. L.H. Hodgden.


337 Special Investigations in the Theory of Architecture Fall or spring. Variable credit (maximum, 3). Prerequisite: permission of instructor. Hours to be arranged. Independent study.


435 Architecture and Re-presentation Fall. 3 credits. Limited to degree candidates in architecture. Prerequisite: successful completion of Architecture 231–232. Not offered 1985–86. Lectures, disc, and reviews. TR 2:30–4:30. V. Warke. A study of architecture as it functions as a representational art, referring to its past while inferring its present.

635 Critical Theory in Architecture Spring. 3 credits. Prerequisite: permission of instructor. Seminar, 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. Prerequisite: permission of instructor. Hours to be arranged. Independent study.

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 1985–86. Seminars, M W 10:10–12:15. 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 Courses

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 I Fall. 2 credits. Studios, TR 2:30–4:25. Staff. Freehand drawing with emphasis on line and perspective representation of form and space.

152 (192) Drawing II Spring. 2 credits. Prerequisite: Architecture 151. Studios, TR 2:30–4:25. Staff. Freehand drawing as a means of conceiving and expressing spatial form; line weight, shades and shadows, and figure drawing.

251 Introductory Photo I (also Art 161) Fall or spring. 3 credits each term. Hours to be arranged. Staff. For description see Art 161.

351 Introductory Photo II (also Art 261) Spring. 3 credits. Prerequisites: Architecture 251 or Art 161, or permission of instructor. Hours to be arranged. Staff. For description see Art 261.

353 Large-Format Architectural Photography Spring. 3 credits. Prerequisites: Architecture 251 or Art 161 or 261, or permission of instructor. Darkroom fee, $50. Not offered 1985–86. Lec and studio, hours to be arranged. Staff. The special uses of large-format view camera photography. Emphasis on the creative use of the view camera in architectural photography.

355 Graphic Design Studio Fall or spring. 3 credits. Prerequisite: Architecture 151 or 152, or permission of instructor. Not offered 1985–86. Lec and studio, hours to be arranged. Staff. Design and preparation of materials for reproduction in print media. Studio in typography, available printing processes, and photomechanical methods of reproduction.

356 Architectural Simulation Techniques Spring. 3 credits. Prerequisite: Architecture 151 or permission of instructor. Not offered 1985–86. Lec and studio, hours to be arranged. G. Hascup. Two- and three-dimensional simulation techniques in architecture. Emphasis on simulation of environment, space, materials, and lighting as visual tools for architectural design.

457 Special Project in Photography Fall or spring. Variable credit (maximum, 4). Limited to undergraduates. Prerequisites: written proposal outlining the special project and permission of instructor. Not offered 1985–86. Hours to be arranged. Staff. Independent study.

458 Special Project in Design Communication Fall or spring. Variable credit (maximum, 4). Limited to undergraduates. Prerequisites: written proposal outlining the special project and permission of instructor. Hours to be arranged. Staff. Independent study.
Architectural Science and Technology Courses

261 Environmental Controls—Site Planning Fall. 3 credits.
Lecs, M W F 11:15-1:10; T. Peters.
The basic principles involved in design in the outdoor environment. A brief historical perspective. A development of inventory including grading and drainage. Foundations, surfacing, and construction.

262 Building Technology, Materials, and Methods Spring. 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.
Lecs, M W 10:10-12; F 10:10-12. J. Axley.
Basic properties and principles of sound and light. Sound phenomena, noise control, absorption, acoustical design. Light, color, and form. Natural lighting possibilities and constraints. Good and bad examples of artificial lighting.

362 Environmental Controls—Mechanical and Passive Solar Systems Spring. 3 credits each term.
Lecs, M W F 10-10:30; J. Axley.
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.
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.
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.

376 (338) Computers in Architecture Seminar Fall or spring. 2 credits. Prerequisites: Computer Science 100 or equivalent. Not offered 1985–86.
Hours to be arranged. Staff.
Exploration of the use of computers in a variety of ways encompassing architectural practices 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. Not offered 1985–86.
Hours to be arranged. Staff.
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 or spring. 3 credits each term. T 1:25–4:25. Staff.
An examination of organizational and management theories and practices for delivering professional design services. Included are an assessment of the building industry and its influence on practice; an analysis of the basic management functions within professional firms and the legal concerns facing practitioners today. Sessions with selected guest participants focus on case studies.

477–478 (437–438) Special Projects in Computer Graphics 477, fall; 478, 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.
Hours to be arranged. Staff.
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 1985–86.
Hours to be arranged. Staff.

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. Not offered 1985–86.
Staff.
Advanced topics involving interactive computer graphics and advanced environmental design techniques. Topics may include acoustics, lighting, and energy analyses.

582 Environmental Control Systems Fall or spring, 3 credits. Prerequisite: Architecture 362. Not offered 1985–86.
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.
Sem, M W F 11-15. B. MacDougall.
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, fall; 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.

763–764 Thesis or Research in Architectural Science 763, fall; 764, spring. Variable credit. Limited to architectural science graduate students. Hours to be arranged. Independent study.

Architectural History

The history of the built environment 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 three additional courses from the 350–390 series (except for Architecture 395), preferably in the third or fourth year. 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 most immediate 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.
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 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.
Hours to be announced. C. Otto.
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 are addressed in greater detail for architecture and urban design 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.
An introduction to the issues and purposes in architecture. The metaphor of language will be 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, will be examined to develop students' skills in visual analysis and in "reading the messages" in architectural design.

Directed Electives

Hours to be announced. 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 Fall or 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 every year.

Hours to be announced. R. G. Calkins.

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.


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 Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year. Not offered 1985–86; next offered 1986–87.

Hours to be announced. 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.


History, ideas, and theories of architecture and urban design in Europe between 1700 and 1800. Special consideration is given to the contribution and significance of major architects of the time.


History, ideas, and theories of architecture and urban design in Europe between 1800 and 1890. Special consideration is given to the contribution and significance of major architects of the time.

388 The Twentieth Century Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year; next offered spring 1987.

Hours to be announced. M. Woods.

Examination of the leading trends in Western architectural theory and practice from the rationalist traditions through the arts-and-crafts movement.

390 American Architecture I Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year; next offered 1986–87.

History of American architecture and urbanism from the late eighteenth century to the Civil War, with emphasis on stylistic developments, and on the relationship of architecture to the economy, society, and the aesthetic ideals of the time.

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 1986–87.

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.

395 Special Investigations in the History of Architecture Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year; next offered spring 1989.

Hours to be announced. M. Kubelik.

Topic to be announced by prerogation.

396 Special Topics in Architectural History Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year; next offered spring 1986.

Hours to be announced. C. F. Otto.

Topic to be announced by prerogation.

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; next offered spring 1986.

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.

398 Special Topics in Architectural History Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year; next offered spring 1986.

History, ideas, and theories of architecture and urban design in Europe between 1800 and 1890. Special consideration is given to the contribution and significance of major architects of the time.

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 spring 1986.

History, ideas, and theories of architecture and urban design in Europe between 1800 and 1890. Special consideration is given to the contribution and significance of major architects of the time.

400 Undergraduate Thesis in Architectural History and Urban Development Fall or spring. 4 credits. For B.S. honors candidates in history only.

Hours to be announced. M. A. Tomlan.

Courses in Preservation

582 (542) Methods of Archival Research (also City and Regional Planning 461) Fall. 3 credits. 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 587) 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.

Comprises 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 583) Fall. 3 credits. Hours to be announced. 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.

585 (545) Perspectives on Preservation (also City and Regional Planning 562) Fall. 3 credits. Hours to be announced. M. A. Tomlan and visiting lecturers.

Introductory course for preservation planning. The rationale for, and methods of, using historical and aesthetic resources in the planning and design of regions and cities.

586 (546) Documentation for Preservation Planning (also City and Regional Planning 560) Fall. 3 credits. Hours to be announced. M. A. Tomlan and visiting lecturers.

Methods of collecting, recording, processing, and analyzing historical architectural and planning materials.

587 (547) Building Materials Conservation (also City and Regional Planning 564) Spring. 3 credits. Open to juniors, seniors, and graduate students.

Hours to be announced. T. Werzbicky.

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 organizations. Lectures and training sessions. Emphasis on fieldwork with individuals and community organizations.

Seminars in Architectural History

681 Seminar in the Architecture of the Classical World Fall or spring. 4 credits. Prerequisites: Architecture 381 or permission of instructor.

Hours to be announced. M. Kubelik.

Issues in Greek and Roman architectural history. Specific topic to be announced.

684 Seminar in the Renaissance Fall or spring. 4 credits. Prerequisites: Architecture 384 or permission of instructor.

Hours to be announced. M. Kubelik.

Issues in European architecture and city planning of the fifteenth and sixteenth centuries. Specific topic to be announced.

685 Seminar in the Baroque Fall or spring. 4 credits. Prerequisites: Architecture 385 or permission of instructor.

Hours to be announced. M. Kubelik.

Issues in European architecture and urban design between 1600 and 1800. Specific subject to be announced.

687 Seminar in Nineteenth-Century Architecture Fall or spring. 4 credits. Prerequisites: Architecture 387 or permission of instructor.

Hours to be announced. M. Woods.

Issues in European architecture and urbanism in the nineteenth century. Specific subject to be announced.

688 Seminar in Twentieth-Century Architecture Fall or spring. 4 credits. Prerequisites: Architecture 388 or permission of instructor.

Hours to be announced. C. Otto.

Special topics in the history of European architecture and urban design in Europe and America during the twentieth century. Specific subject to be announced.
690 Seminar in American Architecture  
Fall or spring. 4 credits. Prerequisites: Architecture 390–391 or permission of instructor. Hours to be announced. M. Woods.

Historical topics in the architecture of the nineteenth and twentieth centuries in the United States. Specific subject to be announced.

693 Seminar in the History of American City Planning (also City and Regional Planning 660)  
Spring. 3 credits. Prerequisites: Architecture 393 or permission of instructor. Hours to be announced. J. W. Reps.

A research seminar in which each student selects a topic for oral presentation followed by the completion of a research paper. Early sessions examine the scope of planning applications to other disciplines, sources of written and graphic materials, and the uses of historical evidence in interpreting urban planning and development.

696 Seminar in the History of Architecture and Urban Development  
Fall or spring. 4 credits. Prerequisites: permission of instructor. Hours to be announced. M. Kubelik.

Topic to be announced.

697 Seminar in the History of Architecture and Urban Development  
Fall or spring. 4 credits. Prerequisites: permission of instructor. Hours to be announced. C. Otto.

Topic to be announced.

698 Seminar in the History of Architecture and Urban Development  
Fall or spring. 4 credits. Prerequisites: permission of instructor. Hours to be announced. M. Woods.

Topic to be announced.

699 Seminar in the History of Architecture and Urban Development  
Fall or spring. 4 credits. Prerequisites: permission of instructor. Hours to be announced. Staff.

Topic to be announced.

790 Informal Study in the History of Architecture and Urban Development  
Fall or spring. Variable credit. Prerequisites: permission of instructor. Hours to be announced. Staff.

Independent study for graduate students.

890 Thesis in Architectural History  
Fall or spring. Variable credit. Prerequisites: permission of instructor. Hours to be announced. Staff.

Independent study for the master's degree.

990 Dissertation in Architectural History  
Fall or spring. Variable credit. Hours to be announced. Staff.

Independent study for the doctoral degree.

**Art**


The curriculum in art is an independent program of study within the College of Architecture, Art, and Planning. However, the intimate relationships between the fine arts and training in architecture and urban planning is a source of special strength in the Cornell program and affords unusual benefits to the students in these three disciplines.

The undergraduate curriculum in art is an excellent background for a career in applied art and offers courses in the use of graphics in modern communications. There are numerous technical courses offered in such areas as interior design, fashion, and commercial art.

The department discourages accelerated graduation. However, a student may petition for graduation in the early summer by submission of a petition to the faculty before course enrollment in the spring semester of the student's junior year.

A candidate for the B.F.A. degree who also wants to earn a Bachelor of Arts degree from the College of Arts and Sciences can arrange to do so. This decision should be made early in the candidate's career (no later than the third semester), so that he or she can petition to be registered in both colleges simultaneously. Each student is assigned an adviser in the College of Arts and Sciences to provide needed guidance. Those students who are interested primarily in the history rather than in the practice of art should apply for admission to the College of Arts and Sciences with the objective of pursuing a major in the Department of History of Art in that college. Department of Art studio courses may then be taken as electives.

The B.F.A. program is designed so that students may fulfill the degree requirements of 130 credits with a minimum of 64 credits taken in the Department of Art and a minimum of 50 credits taken outside the department. Within these ranges, students may design their programs subject to the following limitations:

1) Of the minimum of 50 elective credits to be taken outside the Department of Art, 12 credits must be in English, history, or other humanities offered in the College of Arts and Sciences. In the first two years 9 credits in history of art at the 200 level or higher or in architectural history must be completed. An additional 12 credits in art history at the 200 level or higher or in architectural history must be completed in the last two years. Also, 12 of the total 21 required credits must be in introduction to art history courses at the 200 level.

2) Students must also plan their programs to complete 30 credits in courses in one of the following studio areas: painting, sculpture, printmaking, or photography. They should plan to complete 20 credits in each of two of the above areas. They should plan to complete all fourth-year studio concentration courses. 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 absentia 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

**Fall Term**

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>110</td>
<td>Color, Form, and Space</td>
<td>3</td>
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<tr>
<td>111</td>
<td>Introductory Art Seminar</td>
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<tr>
<td>121</td>
<td>Introductory Painting</td>
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<td>141</td>
<td>Introductory Sculpture</td>
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<td>151</td>
<td>Introductory Drawing</td>
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<td>Introductory Etching</td>
<td>3</td>
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<td>132</td>
<td>Introductory Graphics</td>
<td>3</td>
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<td>133</td>
<td>Introductory Lithography</td>
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<td>Introductory Drawing</td>
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### Second Year

**Fall Term**

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<td>Elective(s)</td>
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through the study of pictorial composition; proportion, relation to problems in the theory of art are studied.

A seminar course in issues of contemporary art, including lectures by visiting artists.

A study of traditional and contemporary ways of painting. An analysis of color theory and pictorial space.

Hours to be arranged. G. Page.

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.

231 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.

232 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.

241 Senior Thesis in Painting Fall or spring. 6 credits. Prerequisite: Art 322 or 321 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.

421 Senior Thesis in Printmaking Fall or spring. 6 credits. Prerequisite: Art 331 or 332 or permission of instructor. Hours to be arranged. Staff. Advanced printmaking project to demonstrate creative ability and technical proficiency.

721–722, 821–822 Graduate Painting Fall and spring. 6 credits. 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.

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, light ground, relief printing, monotypes, and experimental techniques.

132 Introductory Graphics Fall, spring, or 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 or spring. 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. Continued study of the technique and practice of methods of intaglio printing, with emphasis on techniques and color.

232 Silk-Screen Printing Fall or 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 of the 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.

Courses in Theory and Criticism

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.

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 each semester, and for out-of-college students the fee is $50 plus $10 per term course fee.

Courses in Graphic Arts

110 Color, Form, and Space Fall, spring, or summer. 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.

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.

311 Issues in Contemporary Art Fall. 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. Open to other graduate students. 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

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.

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.

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.

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.

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.

222 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 821; 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, or 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 or spring. 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. Continued study of the technique and practice of methods of intaglio printing, with emphasis on techniques and color.

232 Silk-Screen Printing Fall or 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 of the 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.

Studio Courses in Sculpture

141 Introductory Sculpture Fall, spring, or summer. 3 credits. Hours to be arranged. Staff. A series of studio problems introduce the student to the basic considerations of artistic expression through three-dimensional design. Modeling in Plasteline, building directly in plaster, and casting in plaster.

241 Sculpture II Fall or spring. 3 credits. Prerequisites: Art 141 or permission of instructor. Hours to be arranged. Staff. Various materials, including clay, plaster, wood, and stone, are used for exercises involving figurative modeling, abstract carving, and other aspects of three-dimensional form and design.

341 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.

342 Sculpture IV Spring. 4 credits. Prerequisite: Art 241 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.

441 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.
Advanced sculpture project to demonstrate creative ability and technical proficiency.

442 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.

741—742, 841—842  Graduate Sculpture  741 and 841, fall; 742 and 842, spring. Credit as assigned. May be repeated for credit. Limited to M.F.A. students in sculpture. 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. Weekly discussion sessions of works in progress are held.

Studio Courses in Photography

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.

161 Introductory Photography I (also Architecture 251) Fall, spring, or summer. 3 credits. Hours to be arranged. Staff. A basic lecture-studio course in black and white photography for beginners. Emphasis is on basic camera skills, darkroom techniques, and understanding of photography imagery.

261 Photography II (also Architecture 351)  Fall or spring. 3 credits. Prerequisites: Art 161 or permission of instructor. Hours to be arranged. Staff. A continuation of Introductory Photography I.

263 Color Photography  Fall, spring, or summer. 3 credits. Prerequisite: Art 161 or permission of instructor. Hours to be arranged. S. Bowman. A studio course in color photographic processes, including color film developing and color printing. Emphasis is on camera skills, color techniques, image content, and creative use of color photography.

264 Photo Processes  Fall or spring. 3 credits. Prerequisite: Art 161 or permission of instructor. Hours to be arranged. J. Locey. A studio course in photo and nonsilver processes. Emphasis is on camera skill, basic techniques and processes, image content, and creative use of photo processes.

265 Large-Format Photography  Fall or spring. 3 credits. Prerequisite: Art 161 or permission of instructor. Hours to be arranged. Staff. A studio course in the use of large-format cameras, with emphasis on technique and creative use of materials and equipment.

361 Photography III  Fall. 4 credits. A studio course intended for photography majors and other qualified students. Prerequisite: Art 261, 262, or 263 or permission of instructor. Hours to be arranged. Staff. Continued study of creative use of photography, with emphasis upon specialized individual projects.

362 Photography IV  Spring. 4 credits. A studio course intended for photography majors and other qualified students. Prerequisite: Art 361 or permission of instructor. Hours to be arranged. Staff. A continuation of Art 361.

461 Photography V  Fall. 6 credits. Prerequisite: Art 361 or permission of instructor. Hours to be arranged. J. Locey. A studio course intended for photography majors and other qualified students.

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.

751—752, 851—852  Graduate Photography  751 and 851, fall; 752 and 852, spring. Credit as assigned. May be repeated for credit. Limited to M.F.A. students in photography.

Special Studio Courses

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.

471 Independent Studio  Fall, spring, or summer. Variable credit (maximum, 6). Students may register for two studios in a semester. May be repeated for credit. Prerequisite: written permission of instructor. Department staff.

City and Regional Planning


The department offers several programs of study at both the undergraduate and graduate levels.

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. An introductory course in urban and regional issues and one in nonquantitative research methods and writing are also introduced during the first two years. The junior and senior years require a major concentration in the field. Six specific courses are taken to provide a foundation of knowledge in the major concentration. In addition, one course is required in each of urban sociology, history, government, and economics. The additional elective course work will permit the student to gain greater depth of knowledge and acquire a broader understanding of specific topics of individual interest. These courses may be in any related subject, such as housing, urban design, neighborhoods, new towns, energy, environmental controls, economic development, land use, social policy, international planning, and many other topics.

Basic Requirements for Graduation

1) General Education
a. Freshman Seminars: 6 credits
b. Mathematics: 6 credits
c. An approved course in a foreign language (minimum of 6 credits) in each of the four categories below: 24 credits
   1. Biological sciences
   2. Physical sciences
   3. Social sciences
   4. Humanities
   5. Foreign languages
   6. Programming language/computer science

2) Major Concentration: 37 credits
   a. Department requirements: 25 credits
      CRP 100  Introduction to Urban and Regional Planning 3 credits
      CRP 200  Research Methods in Urban and Regional Studies 3 credits
      CRP 320  Introduction to Quantitative Methods I 3 credits
      CRP 321  Introduction to Quantitative Methods II 3 credits
      CRP 340  Planning, Power, and Decision Making 3 credits
      CRP 400  Introduction to Urban and Regional Theory 3 credits
      CRP 480  Environmental Politics 3 credits
      CRP 481  Urban Aesthetics 3 credits
   b. Other courses required: 12 credits
      One course in each of the following areas. The list of available courses is prepared each semester.
      1. Urban sociology
      2. Urban history
      3. Urban government
      4. Urban economics

3) Electives: 47 credits
   a. Directed electives (related to urban and regional studies): 16 credits
   b. Free electives: 31 credits
      Minimum total credits: 120 credits

The University requirement of two terms of physical education must be met.

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.

New York State Assembly Internships. A limited number of session internships with the New York State Assembly are available, on a competitive basis, to students of sophomore status and above in the Urban and Regional Studies Program and who are also enrolled in New York State colleges and universities. The New York State Assembly also sponsors a summer internship.

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. Under development are others 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 also 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 for the bachelor’s 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 the 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 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, architecture, fine arts, management, 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 Stuart W. Stein, Program Director, Urban and Regional Studies, Cornell University, 106 West Sibley Hall, Ithaca, New York 14853-6701 (telephone: 607-256-4025).

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. There is overlap among these three areas of professional and scholarly study, and 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 process of development, plan making, and administration.

History and historic preservation planning (organized through the graduate Field of History of Architecture and Urban Development) is a special process that deals with 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 best be used.

Local economic policy is concerned with understanding and influencing how economic change may be harnessed to the benefit of communities, countering plant closings and more general 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. Several graduate degrees are offered: the Ph.D.; the Master of Regional Planning (M.R.P.), 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.

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.

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. Upperclass undergraduate courses are numbered from 300–499. (Undergraduates with the necessary prerequisites and permission of the instructor may enroll in courses numbered 500 and above.); (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.

Urban and Regional Theory

[100 Introduction to Urban and Regional Studies Fall 3 credits. Not offered 1985–86.]

Staff.

An introduction to the field of urban and regional studies, including the history of the development of cities and regions and regional science 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. Not offered 1985–86.]

Staff.

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 evidence, and analysis in 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 affairs will be considered in the context of current urban issues. The differences between scholarly and policy research will be examined.]

400 Introduction to Urban and Regional Theory Fall. 4 credits. Open to juniors and seniors. B. G. Jones. 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 such topics as population distribution, migration, location of industry and economic activity, and the spatial organization of urban and regional systems.

404/600 Urban Economics Fall. 4 credits. Prerequisite: basic economics.

T 10:10–12:05, plus optional workshops. S. Czamanski. Urban phenomena are analyzed from an economic point of view. Areas examined include economic aspects of urbanization processes and changes, 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.

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 texts will be read, criticized, and discussed in seminars. Students will participate in teams to work on current planning problems.

708 Fieldwork or Workshop in Urban and Regional Theory Fall or spring. Credit as assigned. 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. Credit as assigned. 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 examined. Major theoretical contributions to the understanding of intraregional and intraurban 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. Credit as assigned. Staff.

Planning Theory and Politics

411 Introduction to Planning Fall. 4 credits. M W F 10:10. P. Clavel and staff.
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 criticized.

413 Planning and Political Economy I Fall. 4 credits. Staff.
This course deals with Marx’s methodological approach and his elaborations in volume one of Capital. Topics will cover Marx’s method, labor theory of value, labor-process and surplus-value, absolute and relative surplus-value, general law of capital accumulation, and transition from feudalism to capitalism. Basic texts will be supplemented with readings and discussion about current urban problems.

414 Planning and Political Economy II Spring. 4 credits. Prerequisites: students must have read volume one of Capital and be generally familiar with Marx’s approach.
Introduction to volumes two and three of Marx’s Capital and his Theories of Surplus Value. Discussion of selected topics among the circulation of capital, productive and unproductive labor, reproduction schemes, accumulation, the transformation of surplus-value into profits, the transformation of values into prices of production, the tendency of the rate of profit to fall, and crises. Emphasis on interpretation of current urban problems.

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.

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.

Staff.
An examination of contemporary social and economic conditions of neighborhoods; community differentiation; socialization; and revitalization policies and practice; community control; and the role of the community in the provision of goods, services, and social support.

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.
A survey of organizational and administrative models relevant to planning formation and implementation. Applications are made to such programs as community development, regional adaptation, urban renewal, and land-use control.

718 Fieldwork or Workshop in Planning Theory and Politics Fall or spring. Credit as assigned.
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. Credit as assigned.
Staff.

819 Informal Study in Planning Theory and Politics Fall or spring. Credit as assigned.

Quantitative Methods and Systems Analysis

320 Introduction to Quantitative Methods I 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, and testing of hypotheses and models of social, economic, and physical phenomena of cities and regions. Applicable methods in probability, descriptive statistics, estimation, hypothesis testing, prediction, 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 Spring. 3 credits. Prerequisite: CRP 320 or permission of instructor.
S. Saltzman.
A continuation of City and Regional Planning 320.

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. 3 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 micro-computers 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 Spring. 3 credits. Prerequisite: CRP 521 or equivalent. Not offered 1985–86.
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, PPSIS, and PERT, were developed directly or were adapted for use in social planning.)

624 Statistical Analysis for Planning and Public Policy I Fall. 3 credits. Prerequisites: CRP 520 or equivalent and permission of instructor. 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 Spring. 3 credits. Prerequisite: CRP 624. 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. D. Lewis. The design and use of simulation models in planning and policy 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. Credit as assigned. 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. Credit as assigned. Staff.

829 Informal Study in Quantitative Methods and Analysis Fall or spring. Credit as assigned. Staff.

Regional Development Planning

530 Introduction to Regional Development Planning Fall. 3 credits. Prerequisite: CRP 500. Not offered 1985–86. 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. Theories 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 1985–86. 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. Prerequisite: linear algebra, elementary calculus, and matrix algebra. W 10:10–12:05, plus optional workshops. S. Czarnanski. The course focuses on issues of industrial, as distinct from agricultural, development. Material includes theory of production, elements of growth theory, interindustry relations and formulation of industrial complexes, locational attractiveness, and interregional flows of goods, services, and factors of production.

732 Regional Industrial Development Fall. 4 credits. Prerequisites: basic economics and elementary calculus. W 10:10–12:05, plus optional workshops. S. Czarnanski, E. Clavel. The course focuses on issues of industrial, as distinct from agricultural, development. Material includes theory of production, elements of growth theory, interindustry relations and formulation of industrial complexes, locational attractiveness, and interregional flows of goods, services, and factors of production.

738 Fieldwork or Workshop in Regional Development Planning Fall or spring. Credit as assigned. Staff. Work on applied problems in regional development planning in a field or laboratory setting or both.

739 Special Topics in Regional Development Planning Fall or spring. Credit as assigned. Staff.

832 Location Theory in Physical and Policy Spaces Fall or spring. 3 credits. Prerequisites: CRP 500 and 620 and Economics 311–312, or equivalent. R 7–10 p.m. W. Isard. Traditional Weberian location doctrine; transport orientation, labor orientation, agglomeration, and urban rent theory are examined in both physical and policy spaces. Interregional trade and market and supply area analysis is treated. Particular attention is paid to Loschian and Christaller systems of urban places, and coalition structures.

833 Conflict Management in Multiregion Planning Spring. 3 credits. W. Isard. Basic elements for the analysis of conflicts among policy makers in multiregion situations are examined. Particular emphasis is given to conflicting objectives among different interest groups, regions, and nations, and diverse procedures to reach compromise solutions are examined. The use of maximizing incremental procedures, game theory, and diverse methods for establishing priorities and cooperative action as well as recursive, interactive approaches to resolve conflict are considered.

839 Informal Study in Regional Development Planning Fall or spring. Credit as assigned. Staff.

Social-Policy Planning

340 Planning, Power, and Decision Making Fall. 3 credits. W 2:30–4:25. S. Saltzman. An introduction to the administrative and political environment in which urban and regional issues occur. Starting from an analysis of social 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 attention is also given to the underlying dynamics of economic and political development in cities and regions, and the roles that various participants play in these decision processes.

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. T R 2:30–4:25. D. Nelkin. 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. W 2:30–4:30. D. Nelkin. A view of science less as a seamless 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.

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 problem areas will be explored.

540 Introduction to Social-Policy Planning Fall. 4 credits. Not offered 1985–86. 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 source 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 refrenchment, 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.

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 instructor. Co-sponsored by the Program on Science, Technology, and Society. Hours to be arranged. D. Nelkin.

A continuation of City and Regional Planning 541, focusing on technical 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. Credit as assigned. Not offered 1985–86.

R 10-11, 12-2 05 J. Forester.

An exploration of planners' roles with special attention to organizational and political contexts of planning and policy analysis efforts. Focus is on communicative dimensions of professional behavior and planning practice; planning is assessed as an organizing activity extending far beyond technical problem solving.


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 autonomy in service delivery.

545 Introduction to Public Policy Analysis and Management Fall or spring. 3 credits.

S. Saltzman.

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 sector decision making will be reviewed and their respective strengths and weaknesses evaluated. Applications to a variety of public sector problem areas will be explored.


R 10-11, 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.

643 Legal Aspects of Public Administration Fall. 3 credits.

M 11 W 11:15 R. Booth.

Examination of basic legal issues that commonly arise in the administration of government 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 planning problems and in choosing among alternative solutions. Applied aspects of welfare economics will also be considered. Additional topics will include relevant microeconomic concepts in public finance, cost-benefit analysis, and related areas. Applications to a variety of public sector problem areas will be explored.

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. Not offered 1985–86.


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, institutional 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. Credit as assigned. Not offered 1985–86.

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?

749 Fieldwork or Workshop in Social-Policy Planning Fall or spring. Credit as assigned.

Work on applied problems in social-policy planning in a field or laboratory setting or both.

751 Suburbanization and Metropolitan America Fall. 3 credits. Prerequisite: permission of instructor.

I. R. Stewart.

The major issues in suburban development, metropolitan growth analysis, and the role of new communities in accommodating expected future population.

552 Urban Land-Use Planning I Spring. 3 credits. Prerequisite: CRP 551 or permission of instructor.


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.

553 Urban Land-Use Planning II Spring. 3 credits. Prerequisite: CRP 552 or permission of instructor.

K. C. Parsons.

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.

T R 12:20 S. Stein.

Intended for students without design backgrounds. Lectures, seminars, readings, and design exercises explore basic concepts and issues related to urban planning, urban design, site planning, and environmental awareness. Emphasis is on professional practice.

555 Planning Design Workshop Spring. 2 or 4 credits. No previous graphics or design experience required.

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. 2 or 4 credits.

Fieldwork hours to be arranged. Organizational meeting 10:10 first W 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, storefront rehabilitation, signage, and comprehensive planning, are explored in a workshop setting.

561 Urban Land Policy and Programs Fall.

3 credits. Prerequisite: CRP 563 or permission of instructor.


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.

562 The Urban Development Process Spring.

2 credits. Enrollment limited. Prerequisite: CRP 511 or permission of instructor.


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.

563 Legal Aspects of Land-Use Planning Spring.

3 credits. Prerequisite: CRP 511 or permission of instructor.

R 12:20–2:15 Staff.

Survey of leading cases and legal concepts in land-use planning, with particular attention to zoning, subdivision control, condemnation, and growth-control issues.

564 Real Estate Development I: Advanced Analysis and Critique Spring. 4 credits.

H. Milstein.

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 Fall. 4 credits. Prerequisites: CRP 654 or equivalent. Limited to 20 students with permission of instructor. H. Missian. A continuation of City and Regional Planning 654.

656 Land Resources Protection Law Fall. 3 credits. M W F 9:05. 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. Credit as assigned. Staff.

758 Fieldwork or Workshop in Urban Development Planning Fall or spring. Credit as assigned. 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. Credit as assigned. Staff.

859 Informal Study in Urban Development Planning Fall or spring. Credit as assigned. Staff.

Special Interprogram Topics: History and Historic Preservation

461 Methods of Archival Research (also Architecture 582) Fall. 3 credits. K. C. Parsons. 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. M W F 9:05. 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.

560 Documentation for Preservation (also Architecture 586) Fall. 3 credits. M 2:30–5:30. M. A. Tomlan. 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 2:30–5:30. T. Werbizky. 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. T 1:25–4:25. M. A. Tomlan. An 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 2:30–4:25. J. W. Reps. Urban and regional planning pioneers, and planning during the period between the Senate Park Commission proposals for Washington in 1902 and the beginning of World War II. Students will use the unique collection of twentieth-century planners in Olin Library and the extensive holdings of early printed reports in the Fine Arts Library. Lectures, seminar discussions, and presentation of student research papers.

566 Urban Planning in Colonial and Nineteenth-Century Hispanic America Fall. 3 credits. Prerequisite: permission of instructor. J. W. Reps. The planned origins and growth of towns and cities in Latin America and in those portions of the United States colonized by Spain. Lectures, readings, bibliographic studies, translations, cartographical exercises, and seminar presentations. Each student will produce a research paper on an aspect of the subject, using library resources at Cornell and elsewhere.

567 Measured Drawing (also Architecture 563) 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 drawing 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.

568 Seminar in the History of American City Planning (also Architecture 693) Fall. 3 credits. Prerequisites: CRP 462 or permission of instructor. J. W. Reps. A research seminar in which each student selects a topic for oral presentation followed by the completion of a research paper. Early sessions examine the scope of planning history, its relations to other disciplines, sources of written and graphic materials, and the uses of historical evidence in interpreting urban planning and development.


Emphasis on factors in urban growth, the process of urbanization, urban reform movement, and intellectual and social responses to the city.

563 Historic Preservation Law Spring. 3 credits. Offered alternate years. M W 9:05. 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 Public Policy and Preservation Planning Spring. 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. Credit as assigned. 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. Credit as assigned. Staff.

869 Informal Study in History and Preservation Fall or spring. Credit as assigned. Staff.

Special Interprogram Topics: International Studies

470 Third World Urbanization Spring. 4 credits. Not offered 1985–86. W. W. Goldsmith and staff. Study of rapid growth and contemporary crisis in the giant cities of the underdeveloped countries. Examination of the enormous problems 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.

570 Seminar in Latin American Urban Planning and Development Fall or spring. 2 credits. Not offered 1985–86. 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 1985–86. 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.
670 Regional Planning and Development in Developing Nations  
Fall. 4 credits. Prerequisite: second-year graduate standing.  
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. 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.

677 Seminar in Science and Technology Policy in Developing Nations  
Spring. 3 credits.  
D. Lewis.  
An examination of the issues facing developing countries as they attempt to use technology in pursuit of their national goals. Topics include alternative sufficiency and integration. Resource development, national integration, human development, and migration problems are discussed.

672 Seminar in Policy Planning in Developing Nations: Technology Transfer and Adoption  
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. 3 credits.  
D. Lewis.  
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 in-depth 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 linkages 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  
Spring. 2 credits.  
K. C. Parsons.  
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 Underdevelopment  
Spring. 3 credits.  
P. Opadwala.  
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; and rural and industrial development in less-developed countries; and planning for developing regions; and planning for developing regions.

778 Fieldwork or Workshop in Planning for Developing Regions  
Fall or spring. Credit as assigned.  
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. Credit as assigned.  
Staff.

875 Fieldwork or Workshop in Planning for Developing Regions  
Fall or spring. Credit as assigned.  
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. Credit as assigned.  
Staff.

Special Interprogram Topics: Environmental Health, Housing, and Institutional Planning

480 Environmental Politics  
Spring. 3 credits.  
M. W. F. 11:15. R. Booth.  
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.  
Investigation of historical and current thought about the visual aspects of cities, including evaluation of technological and cultural influences on urban design, and the influence of perception on urban form, relationships between urban planning and visual form in cities.

490 Student-Faculty Research  
Fall or spring. Variable credit. Limited to undergraduate students in the Urban and Regional Studies program. U grades only.  
Staff.  
Research, reading, and/or writing project that a student and faculty member choose on a topic related to urban and regional studies.

585 Introduction to Environmental Health Issues  
Spring. 3 credits.  
An examination of concepts and issues in environmental health, particularly as they relate to planning for health care and medical care delivery systems, economic development, and other policy issues.

685 Environmental Epidemiology  
Spring. 3 credits. Prerequisite: CEP 520.  
Introduction to epidemiological methods. Emphasis is on the detection of changes in health status associated with changes in environmental conditions, and the significance of these findings for environmental health planning.

686 Environmental Law, Policy, and Management  
Fall. 3 credits. Not offered 1985–86.  
M. W. F. 11:15. R. Booth.  
Examination of selected environmental law topics from a policy management standpoint. Topics include current environmental conditions, legal implications of pollution, and government regulatory procedures.

687 Environmental Management Workshop  
Spring. 3 credits.  
M. W. F. 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.

688 Environmental Law II: Natural Resources and Toxic Substances (also Civil and Environmental Engineering 626)  
Spring. 3 credits. Prerequisite: one course in environmental law or permission of instructors.

Sem, hours to be arranged. R. Booth, N. Orloff.  
Environmental Law I (CEE 625) introduces students to the legal system and explores the legal doctrines governing environmental decision making. This course focuses on the importance of the environment in the judicial process. Special attention is given to the analysis of legislation and judicial decisions. In addition, students prepare a major paper designed to give them experience using a law library and developing legal arguments and legal writing. The course provides an overview of the legal system and the legal process, and the role of the lawyer in a legal context.

784 The Political Economy of Health Planning  
Spring. 3 credits. Not offered 1985–86.  
R 11:15–1:45. Staff.  
Lectures, readings, 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 unfolds. 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.

785 Planning and Evaluation of Environmental Health Programs and Projects  
Spring. 3 credits. Prerequisite: second-year graduate standing.  
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. Application of these methods to the study of particular problems of environmental health.
Environmental Health Planning  Fall. 2 credits. Prerequisite: second-year graduate standing. 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.

Health Systems Planning  Fall. 3 credits. Not offered 1985–86. 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.

Fieldwork or Workshop in City and Regional Planning  Fall or spring. Credit as assigned. Staff.
Work on applied planning problems in a field or laboratory setting or both.

Special Topics in City and Regional Planning  Fall or spring. Credit as assigned. Staff.

Informal Studies in Environmental Health Planning  Fall or spring. Credit as assigned. Staff.

Informal Study in City and Regional Planning  Fall or spring. Credit as assigned. Staff.

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 seminars to be offered each term is determined by the needs of the students.

Professional Planning Colloquium I  Fall. 1 credit. W. 4:30–5:30. Staff.

Professional Planning Colloquium II  Spring. 1 credit. W. 4:30–5:30. Staff.

Master's Thesis, Project, or Research Paper I  Fall. Credit as assigned. Staff.


Planning Internships  Fall, spring, or summer. 1–4 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.

Master's Thesis in Preservation Planning I  Fall. Credit as assigned. Staff.

Master's Thesis in Preservation Planning II  Spring. Credit as assigned. Staff.

Offered through the College of Agriculture and Life Sciences.

Planning Research Seminar I  Fall. 2 credits. Staff.
Intended for doctoral candidates in city and regional planning; other students welcome. Presentation and discussion of current problem areas and research by advanced doctoral students, faculty, and visitors.

Planning Research Seminar II  Spring. 2 credits. Staff.

Doctoral Dissertation I  Fall. Credit as assigned. Staff.

Doctoral Dissertation II  Spring. Credit as assigned. Staff.

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

Landscape Architecture Freshman Orientation  Fall. 1 credit. M. I. Adleman.

Theory and Application Studio  Fall. 6 credits. M. I. Adleman.

Project Design and Site Planning Studio  Spring. 6 credits. T. H. Johnson.

Graphic Communication I  Fall. 3 credits. T. H. Johnson.

Graphic Communication II  Spring. 3 credits. R. T. Trancik.

Principles of Spatial Design  Fall. 3 credits. R. T. Trancik.

Plants and Design  Spring. 3 credits. M. I. Adleman.

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. Lecs, M-W F 1:25; studios, M-W F 2:30–4:25. Required 5-day field trip: D. W. Kraff. The application of planning processes and techniques at a regional scale. Students examine the management of landscape units within physiographic and/or politically defined areas using state-of-the-art methodologies.

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. D. W. Kraff. 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.

Site Construction I  Spring. 4 credits. P. J. Trowbridge.

Site Construction II  Fall. 4 credits. M. I. Adleman.

Landscape Design  Fall. 4 credits. D. W. Kraff.

Senior Project Seminar  Fall. 2 credits. Corequisite: LA 401. R. 2:20. D. W. Kraff. Seminar and preparation of program and base material for senior projects in landscape architecture. Each student is required to select a project, develop a program, collect necessary data and base material, and make a presentation to the class for discussion. Landscape architecture majors must develop an approved project manual as a prerequisite for LA 402.

Advanced Project Design Studio  Fall. 6 credits. R. T. Trancik.

Senior Project Studio  Spring. 6 credits. M. I. Adleman.

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.

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.

Graduate Orientation Seminar  Fall. 1 credit. S-U grades only. D. W. Kraff. Presentation and discussion of work of Cornell faculty members in and related to the Field of Landscape Architecture.

Theory and Application Studio  Fall. 6 credits. Lab fee $20; 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.

Project Design and Site Planning  Spring. 6 credits. Prerequisite: permission of instructor. Lab fee $20; cost of drafting supplies, about $100. Lecs, M-W F 1:25; studios, M-W F 2:30–4:25. D. W. Kraff. 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.
Presentations on topics of currency and significance 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; discs to be arranged. L. Minin.
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 Spring. 3 credits.
Lecs, T R 11:15; discs to be arranged. L. Minin.
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.

530 Urban Landscape Planning and Design Spring. 3 credits. Not offered 1985–86.
Lee, disc, and field trips to be arranged. L. Minin.
The principles and techniques of landscape architectural development and conservation of urban open spaces. 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. 3 credits.
A. S. Lieberman.

532 Regional Landscape Planning II Spring. 4 credits.
A. S. Lieberman.

601 Natural Systems Studio Fall. 6 credits.
P. T. Trowbridge.

602 Urban Systems Studio Spring. 6 credits.
R. T. Trancik.

621 Summer Internship Seminar Fall. 2 credits.
Hours to be arranged. L. Minin.
Presentation and discussion of projects developed during summer internships.

634 Landscape Architectural Research Spring. 3 credits.
T. H. Johnson.

650 Fieldwork or Workshop in Landscape Architecture Fall or spring. 1–5 credits; may be repeated for credit. S-U grades optional.
L. Minin.
Work on applied problems in landscape architecture in a field or studio setting or both.

690 Independent Study in Landscape Ecology and Regional Landscape Planning Spring. 1–3 credits.
A. S. Lieberman.

701 Advanced Project Design Studio Fall. 6 credits.
T. H. Johnson.
Offered through the College of Agriculture and Life Sciences.

702 Graduate Thesis Seminar Spring. 3 credits.
S-U grades only.
Hours to be arranged. L. Minin.
Presentations during the semester will concentrate on aspects of preparing a research or design thesis. While initial focus will be upon structure, organization, and method of development, the major emphasis will be directed toward a critical evaluation of subject matter under investigation.

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
Bertoia, Roberto, M.F.A., Southern Illinois U. Asst. Prof., Art
Blum, Zevi, B.Arch., Cornell U. Assoc. Prof., Art
Buh, Richard, S. J., George Washington U. Assoc. Prof., City and Regional Planning
Brandford, Paul, Ph.D., Harvard U. Asst. Prof., City and Regional Planning
Clavel, Pierre, Ph.D., Cornell U. Prof., City and Regional Planning
Cohen, Peter, M. Arch., Harvard U. Adjunct Assoc. Prof., Architecture
Colby, Victor E., M.F.A., Cornell U. Prof., Emeritus, Art
Coles, James, M.F.A., Cornell U. Asst. Prof., Art
Coker, Edward B., S.S., New York U. Prof., Art
Crump, Ralph W., B.Arch., Cornell U. Prof., Emeritus, Architecture
Czarnski, 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.A., Colorado Coll. 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, Clayton C., Ph.D., U. of North Carolina. Prof., City and Regional Planning
Kelly, Burnham, M.C.P., Massachusetts Inst. of Technology. Prof., Emeritus, City and Regional Planning
Kubiel, Martin, Dr.Ing., Rheinische-Westfalsiche Technische Hochschule (Germany). Assoc. Prof., Architecture
Lewis, David B., Ph.D., Cornell U. Assoc. Prof., City and Regional Planning
Locée, 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
Mayer, Elisabeth H., M.F.A., U. of Texas. Asst. Prof., Art
Miller, John C., M.Arch., Cornell U. Assoc. Prof., Architecture
Miletstein, Howard, J.D., Harvard U. Visiting Prof., City and Regional Planning
Nelkin, Dorothy W., B.A., Cornell U. Prof., City and Regional Planning
Oppenwa, Robert, Ph.D., Cornell U. Assoc. Prof., City and Regional Planning
Osland, John, 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
Peters, Tom F. D. So. (Techn.) and Diploma, Swiss Federal Inst. of Technology. Zurich. Assoc. Prof., Architecture
Poleske, Stephen F., B.S., Wilkes Coll. Prof., Art
Quin, Langdon C., M.F.A., Yale U. Asst. Prof., Art
Reps, John W., M.R.P, Cornell U. Prof., City and Regional Planning
Saltzman, Sid, Ph.D., Cornell U. Prof., City and Regional Planning
Salt, Francis W., M.A., Harvard U. Assoc. Prof., Architecture
Schack, Mario L., M.Arch., Harvard U. Prof., Architecture
Schau, 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.R.P, Massachusetts Inst. of Technology. Prof., City and Regional Planning
Stewart, Ian R., Ph.D., Cornell U. Assoc. Prof., City and Regional Planning
Tomlinson, Michael A., Ph.D., Cornell U. Assoc. Prof., City and Regional Planning
Ungers, O. Mathias, Diploma, Technical U. Karlsruhe (Germany). Prof., Architecture
Veltoritis, Thom, Ph.D., Massachusetts Inst. of Technology. Adjunct Prof., City and Regional Planning
Warke, Val K., M.Arch., Harvard U. Assoc. Prof., Architecture
Welsh, Jerry A., B.Arch., U. of Texas. Nathaniel and Margaret Owings Distinguished Alumni Professor of Architecture, Architecture
Werbzynski, Tania G., B.A., SUNY Binghamton. Instructor, City and Regional Planning
Woods, Mary N., Ph.D., Columbia U. Asst. Prof., Architecture

Faculty Roster 95
The College of Arts and Sciences at Cornell is a College of Arts and Sciences College Scholar Program. May 14 (tentative).

Advance course enrollment Oct. 28- April 7-18

Deadline for requesting Dec. 1 June 1 abroad semester

Deadline for applying to study End of the preceding

of absence or withdrawal for

option (S-U).

Last day for requesting leave Oct. 25 March 21

of the four groups listed below:

Group 1 a. Biological sciences

b. Physical sciences

Group 2 a. Social sciences

b. History

Group 3 a. Humanities

b. Expressive arts

Group 4 a. Mathematics and computer science

b. A course sequence in one of the

subdisciplines above that has not been

used to satisfy group 1, 2, or 3. See the

section “Distribution Requirement.”

5) Major

6) Electives: Four or five courses (or 15 credits) in

courses not used to fulfill other requirements and

not in the major department.

7) Credits: A total of 120 credits, of which 100 must be

taken in the College of Arts and Sciences.

8) Residence: Eight full-time semesters, unless a

student can successfully complete the other

requirements in fewer than eight semesters and is

allowed to accelerate graduation. See the section

“Residence.”

9) Physical education: Completion of the University

requirement. See p. 23.

Ordinarily a course may not be used to fulfill more than

one college requirement. See the section “Courses and

College Requirements.”

Minimum Number of Courses

and Credits

Students who are first admitted to college in the fall of

1990 or thereafter 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. Single-credit courses
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. 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 towards
the 100 credits required within the college and also
toward the required thirty-four courses.

Freshman Seminars

Each semester of their freshman year in the college,
students choose a Freshman Seminar from among
more than fifty courses offered by over a dozen 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 following departments teach foreign languages
or literature or both in the College of Arts and Sciences:
Africana Studies and Research Center, Asian Studies,
Classics, German Literature, 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 may choose 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 or

Arabic; Classics 103 in Greek; Classics 106 or

108 in Latin.

3) A score of 560 or better on the College Placement

Test (CPT).

4) 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) Hebrew: departmental examination.

4) Other languages; special examinations; see the professor in charge.

5) 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).

A 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.

<table>
<thead>
<tr>
<th>Language</th>
<th>CPT Reading Score</th>
<th>Language</th>
<th>Literature</th>
<th>Course Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish</td>
<td>Below 450 121</td>
<td>450–559</td>
<td>123</td>
<td>501</td>
</tr>
<tr>
<td></td>
<td>560–649 203</td>
<td></td>
<td>201</td>
<td></td>
</tr>
<tr>
<td></td>
<td>650 and above</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latin</td>
<td>Below 450 101</td>
<td>450–649</td>
<td>Placement by examination</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>650 and above</td>
<td></td>
<td>Apply for the Cornell Advanced Standing Examination (CASE)</td>
<td></td>
</tr>
</tbody>
</table>

Advanced Standing Credit

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

Credit may be granted for high school work for the equivalent of language courses numbered 203, 204. The amount of credit is based on performance on one or more of the following examinations:

a) CPT Advanced Placement Examination.

French, Spanish, and German: A score of 4 or 5 yields 3 credits on the French, Spanish, or German language examinations and literature examinations.

Hebrew: Up to 6 credits may be granted, depending on the student's score on the departmental examination.

Latin: Students should consult the Department of Classics, 120A Goldwin Smith Hall. Students may be tentatively placed in a 300-level Latin course if they achieve a score of 4 or 5 on the CPT Advanced Placement Examination, but they must also take the department's own placement examination during orientation week. A student who is permitted to register in a 300-level course will be given 6 advanced standing credits.

Greek: For information concerning advanced placement, students should consult the chairman of the Department of Classics, 120A Goldwin Smith Hall. Students may be tentatively placed in a 300-level Latin course if they achieve a score of 4 or 5 on the CPT Advanced Placement Examination, but they must also take the department's own placement examination during orientation week. A student who is permitted to register in a 300-level course will be given 6 advanced standing credits.

Distribution Requirement

The purpose of the distribution requirement is to acquaint students with a broad range of subject matter in the liberal arts and to provide them with the opportunity to explore new areas. To this end, subjects are divided into four groups. Each of the first three groups has two subdivisions.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Physical sciences</th>
<th>Biological sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Physics</td>
<td>Biology</td>
</tr>
<tr>
<td></td>
<td>Class</td>
<td>Course</td>
</tr>
<tr>
<td></td>
<td>Requirement</td>
<td>Requirement</td>
</tr>
<tr>
<td>Group 2</td>
<td>Social sciences</td>
<td>History</td>
</tr>
<tr>
<td>a.</td>
<td>Sociology</td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>Humanities</td>
<td>Expresive arts</td>
</tr>
</tbody>
</table>

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Group 4

a. Mathematics and computer science
b. One of the subdivisions not used in fulfillment of groups 1, 2, or 3.

In each of groups 1, 2, and 3, students must take a sequence of 2 courses (6 or more credits) approved by the department in one subject chosen from either subdivision. For group 4, students are strongly urged to take two courses in mathematics. Those who choose not to satisfy the group 4 requirement with mathematics must choose two courses in one subject from an unused subdivision in group 1, 2, or 3. For example, a student who fulfills group 1 with biology, group 2 with psychology, and group 3 with theatre arts could then complete group 4 with a sequence of two courses from the list below in the physical sciences, history, or the humanities.

Courses fulfilling the distribution requirement must be taken in the College of Arts and Sciences; however, students may petition to take Architecture 181–182, History of Architecture I and II, in the Department of Architecture of the College of Architecture. Art, and Planning, fulfills the requirement in expressive arts. Here is a complete list of the courses that fulfill distribution requirements.

Group 1: Physical or Biological Sciences

a. Physical Sciences

Astronomy: 101 or 111, plus 102 or 112, or Astronomy 102 or 112, plus Astronomy 332, Astronomy 103–104, identical to Astronomy 101–102 except for the omission of the laboratories, cannot be used to satisfy the distribution requirement.

Chemistry: 103, 207, or 215 followed by 104, 208, or 216.


Physics: Any two sequential courses as 101–102, 207–208 or 112–213, or any combination of the first term of one sequence and the second term of another. The requirement is also met by any two general education courses from the group 201–206 or by a combination of 101, 112, or 207 with 202, 204, 205, or 206.

b. Biological Sciences

A two-semester introductory biology sequence selected from Biological Sciences 109–110, or 105–106, or 101–103 plus 102–104. Advanced placement in biology with a score of 4 or 5 (6 or 6 credits, respectively) also satisfies the distribution requirement in the biological sciences. Biological Sciences 100, offered during the six-week Cornell Summer Session for 7 credits, also satisfies the distribution requirement.

Group 2: Social Sciences or History

a. Social Sciences


Anthropology: Any two courses in the Department of Anthropology, or Archaeology 100 and any anthropology course.

Archaeology: Any two courses in the Department of Anthropology, or Archaeology 100 and any one of the following: Archaeology 203, 309, 317, 358, 361, or Anthropology 216, 250, 352, 354, 355, 356, 358, 359, 361, 435, 456, 493, 494, 656, 663, 664, 666, 667.

Asian Studies: 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.

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, 113, 161, 181; or any one of these courses followed by a 200-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.

Philosophy: Any two courses in philosophy with the exception of Psychology 123, 322, 324, 326, 350, 361, 396, 422, 425, 429, 471, 472, 473, 476, 491, 492.

Sociology: 101 or 201 or one of these courses followed by any 200-level course in sociology.

Women’s Studies: (a) Any two of 238, 244, 271, 321, 353, 355, 422; 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, 363. (Appropriate courses taken previously may be approved by the program.)

Group 3: Humanities or Expressive Arts

a. Humanities


Archaeology: Archaeology 100 and any of the following: Archaeology 275, 310, 358, 361, 362; Classics 220, 221, 232, 233, 309, 320, 321, 322, 323, 325, 327, 329, 350, 360, 423, 431, 450, 629, 630.


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, 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.

Classics: (a) Any 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 100, 102, 181, 190, 210, 215, 250, 260, 280, 281, 282, 291, 296, 297, 298, 299, 327, 328, 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.


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 the 200 or 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) a combination of two courses in logic, such as 131, 231, 331, 431, 432, 433.

Russian Literature: Any two courses at the 200 level or above except 329, 330.

Spanish Literature: Any two of 201, 315, 316, 317, or any other 300-level literature courses.

Women’s Studies: (a) Any two of 248, 249, 251, 254, 365, 393, 455, 456, 476, 478; or (b) any one of 110, 362, 493, plus one course 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 of the following: History 101, 200, 321, 322, 323, 325, 326, 327, 328, 329, 425, 431.

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 131, 132, 231, or 331 may be used in the Music requirement, they should not take courses numbered in the 80s (e.g., 281, 382).

Theatre Arts: Any two of the 3- or 4-credit courses at the 200 level or above.

Group 4: Mathematics or an Unsubdivided Division

a. Mathematics and Computer Science

Any 6 credits in Mathematics, but not including more than one course from 105, 107, 403.

Computer Science: Any two courses at the 200 or 300 level that form a reasonable sequence or combination.

Music: Any two of 111, 131, 161, 181; or any other course offered by the Department of Economics.

Ninth term. Students may spend a ninth term in Research

The college expects its students to earn credits toward the degree during full-time study at Cornell, normally for eight semesters. Participation in approved programs such as study abroad, fieldwork programs, or Cornell-in-Washington, where 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 20 credits from other institutions as part of the out-of-college electives if the appropriate departments at Cornell approve.

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 or complete any degree with credits accumulated at other institutions 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 section “Part-Time Study and Pro Rata Tuition” or present convincing academic reasons for part-time study.

Residence

In their last two years, students devote roughly one-half their time to acquiring depth and competence in a major subject. The choice of major is not intended to define a student’s life, but to provide a maximum use of the credits. The mathematics distribution 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 Unsubdivided Division

A sequence of courses in any one of the subdivisions of Group 4 that has not been used to fill that group’s requirement.
Special Academic Options

Degree Programs

The following programs allow students to work toward more than one degree or to alter the regular college requirements or departmental requirements for the major.

Independent Major Program

The Independent Major Program allows students to design their own 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 background; 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 director of the Independent Major Program, Academic Advising Center, 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.

Independent major honors. Candidates for honors 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.

College Scholars 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.

College Scholars must complete 120 credits of course work (100 in the college) and, unless they receive special permission from the program to accelerate, eight full terms of undergraduate study. They must complete the physical education requirement. All College Scholars must complete a senior project. They are not required to complete or fulfill the distribution requirement, but members of both the College Scholar and the Academic Advising Center believe that the spirit of the requirement is a good one.

Each applicant to the College Scholar Program is asked to write an essay, which is due in May of the freshman year. Students should contact the Academic Advising Center, Goldwin Smith Hall, for further information.

College Scholar honors. Candidates for honors must maintain a 3.5 average in all courses and must complete two College Scholar seminars. Nonscientists should complete one seminar in some aspect of science, and scientists at least one in the humanities or social sciences. During the senior year candidates for honors complete a thesis or honors project. Students interested in the honors program should confer with the director of the College Scholar Program before the start of the senior year.

Double Majors

A student may complete a double major by fulfilling the major requirements in two departments of the college. No special permission or procedure is required. Students will want, however, to become accepted as a major and be assigned an adviser in each department. Both majors will be posted in the official transcript.

Dual Degree Program

Especially able students may earn both a Bachelor of Arts degree from the College of Arts and Sciences and (1) a Bachelor of Science degree from the College of Engineering or (2) a Bachelor of Fine Arts degree from the Department of Art in the College of Architecture, Art, and Planning or (3) a Bachelor of Science degree in urban and regional studies from the Department of City and Regional Planning in the College of Architecture, Art, and Planning or (4) a Bachelor of Science degree in architectural history from the College of Architecture, Art, and Planning. The dual degree program ordinarily takes five years to complete. Students enter one of these colleges as freshmen and begin the dual degree program with the College of Arts and Sciences in the second year and in some cases, the third year. For further information students should contact assistant dean Rosenzweig, Academic Advising Center, Goldwin Smith Hall (telephone: 256-5004).

Double Registration

Double registration in the College of Arts and Sciences and with the Cornell Law School, Cornell Medical College, or SUNY Upstate Medical Center is possible. A few exceptionally well prepared students who have earned 105 credits before the start of the senior year and have been accepted by one of the above-named professional schools may be permitted to register simultaneously in the college and in one or another of these professional schools during the seventh and eighth terms.

Students registering in the college and in one of the medical colleges listed above receive the Bachelor of Arts degree after their first year of medical studies and the Doctor of Medicine degree after the remaining three years of medical college are completed. Interested students should contact the Academic Advising Center, 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 prelaw counseling help students make appropriate use of the regular curriculum.

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 adviser for the course, must approve the student's program of study and agree to provide continuing supervision of the work. In one semester students may earn up to six credits with one instructor or eight credits with two instructors.

Undergraduate Research Program

Students interested in participating in a faculty member's research and earning credit for the work should consult Marilyn Williams, 135 Goldwin Smith Hall, for a list of research projects available in the physical and biological sciences, social sciences, and the humanities. The Undergraduate Research Program has a modest budget to provide equipment and computer time for some projects.

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 ancient and modern languages, through the joint efforts of the Department of Modern Languages and Literatures 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. Seminars and 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.

Prelaw Study

Law schools neither require nor prefer any particular program of study; they do seek students with sound training in the liberal arts. The important thing is for a student to plan a program in which he or she is interested and does 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. Many prelaw students complete four courses in this program because it interests them, not because it helps them get into law school.

The adviser for students in the College of Arts and Sciences who are applying to law school is the assistant dean for the senior class, Academic Advising Center, Goldwin Smith Hall.

Premedical Study

The breadth and depth afforded by a liberal arts education are invaluable for people who plan 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 or to study at an American institution that offers programs not available at Cornell. 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 1984—85, 108 students studied abroad. Through the Cornell Abroad office, Cornell has established affiliations with several universities in Britain, Egypt, Denmark, and Israel, as well as its own programs in Germany and Spain. Students have studied in those countries and in others all over the world. Before planning a program for study abroad, students should consult the assistant dean 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.
A request to study abroad must have the support of the faculty advisor, and courses must be approved by the directors of undergraduate studies and the departments teaching those subjects. Credits earned abroad may count as part of the 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 Susan Rosenberg, Academic Advising Center, Goldwin Smith Hall. When such situations are met, college permission will be granted on condition that the student in good academic standing the semester prior to departure. The University charges regular Cornell tuition for study abroad. Qualifying 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 and other 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. For students who have keen interest in the subject, 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 Department of Archaeology for information about the sites in the Western Hemisphere, and the Department of Classics and Near Eastern Studies for those in the Mediterranean region.

Marine science. Shoals 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 Cornell professors. 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 study and 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 134 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, Goldwin Smith Hall.

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.

Enrollment in Courses in the College of Arts and Sciences
College registrar: Margery Clauson, Goldwin Smith Hall.

New Students
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 may enroll in courses during the designated period must must complete coursework in the first eight weeks 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, Goldwin Smith Hall. Before signing into courses, students should make appointments with their faculty advisors to plan their programs. Advance course scheduling is the best time to discuss long-range goals with faculty advisors. Decisions can be changed at the beginning of the term, so during advance course scheduling students and faculty can discuss various options to be contemplated. Student advisors will also assist students. Any student is welcome to discuss programs and plans with an assistant dean in the Academic Advising Center, Goldwin Smith Hall. The Records and Scheduling Office also can show last-minute changes in courses; the supplements of other divisions of the University are also available for reference in the Records and Scheduling Office.

Continuing students who want to take courses at University in the fall also receive a copy of their Permanent Record Card, which shows the courses taken, grades received, graduation requirements fulfilled, and academic actions. Copies of Permanent Record Cards are not official transcripts, but they reflect the official record and should be corrected in the Records and Scheduling Office if they are incorrect.

Limits on Course Enrollment
Students must take an average of four or five courses (12 credits) each semester in order to graduate in eight terms. At a minimum, students must carry three or four courses (12 credits) each semester for academic reasons. Students need to carry fewer than 12 credits, they should consult the faculty advisor 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-year freshmen may not register for more than 18 credits; other students may register for more than 18 credits only if their previous term's average was B or higher and if their faculty advisors approve. No more than 22 credits may be taken in a regular semester without permission of the Committee on Academic Records.

A 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 advisors. 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 involves 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. The petition 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 un fraudulently or if, for any other reason, the situation requires some other response in addition to the uniform penalty, the Academic Integrity Hearing Board might make a different recommendation, such as a notation on the student's transcript, suspension, or dismissal.

Special Registration Options

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 eight semesters to take full advantage of the resources of the University. About 10 percent of the students in the college graduate in fewer than eight semesters. They do this in several ways: (a) by bringing advanced placement credit that allows them to condense the first two years and begin upper-level work before the third year, (b) by completing courses in Cornell Summer Session, (c) by taking more than the average number of credits each semester. Acceleration must be planned in advance, it cannot result from an afterthought nor be initiated in the senior year. 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 the 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 a grade 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.

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 advisor. During the first three weeks of the semester, course changes may be made without fees. In order to make changes, the student picks up add/drop forms in the Records and Scheduling Office.

After the third week of classes courses may be added, and after the eighth week courses may be dropped, only by petition. Students who want to drop a course after the eighth week may meet with an assistant dean and submit a petition by the end of the twelfth week of the term. (1) the instructor certifies that the student is working 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 for academic action.

Drops approved after the eighth week will be noted on the transcript by a "W" where the grade would normally appear. No petitions to withdraw from courses may be submitted after the end of the twelfth week in the term. Deadlines for short courses will be adjusted according to the length of the courses. After the midpoint of a short
course, students who wish to add or drop the course must petition to do so.

For each course change approved after the third week there is a $10 fee.

Leaves of Absence

Taking time off from college to think about goals and progress, to gain additional experiences or funds, or just to take a break from studying can be useful. Students in good standing who take a leave by the end of the eighth week of the semester are welcome to register in the college the following semester. Five years is the maximum length of time a student may be on leave and return without special permission. Leaves of absence are of four types:

1) Personal leaves have no conditions concerning the right to reenter the college except for the five-year limit. Readmission is automatic if a written request is 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 Gannett Health Service. 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 Service that the condition has been corrected before they may return.

3) Convulsive 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 after such convulsive 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. If a student takes courses elsewhere while on leave, she or he may petition to have credits accepted as part of the 20 out-of-college credits of the 120 credits needed for graduation. Approval depends up on 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 end of the 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 reenter the college. Students who seek 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 the student who wishes to transfer into the College of Arts and Sciences, a student should complete at least 12 credits of courses in the College of Arts and Sciences with superior grades and without any grades of Incomplete, any S-U grades (unless only S-U grades are offered for that particular course), or any grades below C. Satisfying the above requirement does not, however, guarantee admission. Admission to the college is based upon consideration of the student's entire record at Cornell and the high school record, not just the work and terms attended. The student should see assistant dean Unsworth, in the Academic Advising Center, Goldwin Smith Hall.

Part-Time Study and Pro Rata Tuition

The college ordinarily expects its students to be full-time students. Exceptions are the case of ithaca residents who are twenty-three years of age or older, part-time attendance is permitted only in unusual circumstances.

In certain circumstances seniors who are completing their final term in the college may be allowed to register for fewer than 12 credits and pay pro rata tuition. The guidelines for granting this permission are adhered to strictly.

Guidelines for part-time study:

1) A student who has completed all degree requirements by the end of the seventh term may receive permission to study part-time during the eighth term.

2) A student who has completed all degree requirements in seven terms but is majoring in a department that requires candidates for honor to complete the thesis in the eighth term may be permitted to register for fewer than 12 credits.

3) A student who has received permission to accelerate, but who has been forced to drop a course (for reasons beyond his or her control) and has not been able to complete the course work on the schedule, may be able to complete the requirements as a part-time student.

4) A student who is in the honors program and is not in good standing or in unusual circumstances, if he or she wishes to make up the credits which preclude registering for additional courses, may be allowed to register for fewer than 12 credits.

Any student who wishes to register for part-time study in 1985–86 pay $315.42 per credit plus the full administrative and student service fees of $1,015 per semester. Students who fail to meet graduation requirements in eight semesters may petition the college to enroll in the Division of Extramural Courses.

Additional Information about Courses and Credit

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, but students must arrange for making up examinations or other work. 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 an examination should be sure to contact the professor.

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 the student may apply toward the Bachelor of Arts degree. Tentative credit evaluations are normally provided to external transfers at the time of the notification of their admission. (For information about language courses accepted toward graduation see the section "Language Requirement."

No more than 20 credits in courses not commonly given by the College of Arts and Sciences may be applied toward the degree.

Repeating courses. If the instructor certifies that the course content has not 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, Goldwin Smith Hall.

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.

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, Goldwin Smith Hall.

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.

Honorawards

Dean's List

The requirements for the Dean's List are based on the number of letter grades of A (i.e., A, A-, A+) a student receives for graduation. Grades of C, B, or B- 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 category. In any of the letter grades received are A or better, there must be a balancing number of A's 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.

Incomplete grades. Qualification for the Dean's List is determined by credits completed by the end of the term. If there is an Incomplete grade, the student's name will be considered for the Dean's List retroactively when the Incomplete is made up.
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 warns a student before suspending her or him. In some cases the students will be required to furnish evidence that they are ready to return before being allowed to reregister in the college. Students who request to return in less than a year must present to the committee exceptionally strong evidence of their readiness to return. Required Leave of Absence is posted on the student’s Permanent Record Card in the college; the University registrar is notified and “Leave of Absence” and the date will appear on the student’s transcript.

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, and distributions. 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.

Grades
Letter Grades
See “Grading Guidelines,” p. 23.

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 within the first three weeks of the term to receive a grade of S (satisfactory) or U (unsatisfactory) instead of one of the letter grades (A + through F); provided that the instructor is willing to assign such grades. A grade of S is equivalent to a grade of C— or higher; a grade of U is equivalent to any grade below C—. S means the student receives the credit specified for the course. U means no credit is given. A few courses in the college are graded exclusively S-U.

Courses that will count toward satisfaction of major requirements should not be taken for an S or U grade unless the department grants permission. Students must provide evidence of their readiness to return. The course is not intended to apply to graduate school or for transfer to another college. There is no limit on the number of courses each term for which the S-U grade option may be elected, but within the 120 credits required for the degree, a minimum of 80 credits must be in courses for which a letter grade was given. To elect the S-U option, students fill in the proper space on the optical scan forms during course enrollment. To change the grading option at the beginning of the term, students obtain a course change form from the Office of Records and Scheduling, Goldwin Smith Hall; fill the form out to indicate the grade option change; and have it signed by the course instructor and their faculty adviser. The form must be returned to the Office of Records and Scheduling. Students may not elect the S-U option alter the third week of the term. With special permission they may change from S-U to a letter grade within the first five weeks of term, although a $10 fee is charged after week three. Any senior planning for transfer to another college should take a course for an S-U grade in the last semester and consult with their advisor for seniors.

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 and acceptable to the instructor. Students must have substantial equity in the course; that is, they must be able to complete the remainder of 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 he or she will award if the work is not completed by that date. A course will be incomplete until the instructor changes it and can remain as an incomplete permanently. 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 with a note that this grade was formerly an incomplete.

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.

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 begin to work on their academic difficulties. Advisers 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 change with their advisers; the adviser must review and sign the petition before it may be acted upon. Advisers may also help students with study or personal problems or direct them to other offices on campus—where help is available.

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 schedule with only three 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 given warning informally by a committee of assistant deans in the college or it may be given formally 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.

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 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 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.

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 the course. The student’s name will not disqualify students from making the Dean’s List (no U’s or C- or below), then the student’s name will be retroactively added.

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 and courses with W (withdrawn after the eighth week of classes) 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 when the grade is issued. This grade is used at one-half the credit value toward the previous semester’s computation. 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 both grades 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.

Academic Actions
Warning. Any student who fails to maintain good standing may be given warning informally by a committee of assistant deans in the college or it may be given formally 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.
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 such aspects as study abroad, acceleration, and graduate study. The adviser’s support is especially important if a student petitions for an exception to the requirements for the degree.

Academic Advising Center
Glenn Altshuler, assistant dean, freshmen
Margaret C. Unsworth, assistant dean, sophomores and juniors
Bonnie Buettner, assistant dean, seniors and career programs
Janice P. Turner, assistant dean for minority affairs
Beatrice G. Rosenberg, assistant dean for study abroad, dual degree programs, fellowships, and scholarships

The Academic Advising Center, Goldwin Smith Hall, serves as a resource for faculty and student advisers and for students themselves. The center’s advisers are available to help students define their academic and career goals and to help with specifics such as study abroad programs, field work, etc.

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 description. 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 referent. 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 also offers:

203 Early People: The Archaeological and Fossil Record (also Anthropology 203) Fall. 3 credits. T R 1–2:15. T. P. Volman.

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.

215 Introduction to South Asian Civilizations Fall. 3 credits (4 credits with a special project; consult instructor for information). M W 11:15 plus disc to be announced. Staff.

313 The Japanese Film Spring. 3 credits. Lec. W 11:15, disc. M 11:15. One required film viewing W 4:30; one optional film viewing M 4:30. Staff.

Classics

[211 The Greek Experience Fall. 3 credits. Not offered 1985–86. M W F 11:15. F. Ahl.]

[212 The Roman Experience Spring. 3 credits. Not offered 1985–86. M W F 11:15. Staff.]

217 Initiation to Greek Culture Fall. 4 credits. M T W F 11:15. Staff.

218 Initiation to Roman Culture Spring. 4 credits. M T W F 11:15. Staff.

236 Greek Mythology (also Comparative Literature 236) Fall. 3 credits. T R 8:40–9:55. Staff.


300 Greek and Roman Drama (also Comparative Literature 300) Spring. 4 credits. M W F 2:30. K. Clinton.

337 Ancient Philosophy of Science Spring. 4 credits. Hours to be arranged. M. Cook.

339 Ancient Wit (also Comparative Literature 339) Fall. 4 credits. T R 10:10–11:25. F. Ahl.


English

See, in the department’s listing, “Courses Primarily for Nonmajors.”

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.

497 Heidegger: Short Writings (also Romance Studies 497 and Comparative Literature 497) Fall. 4 credits. Open to upper-division undergraduates and graduate students. R 2:30–4:25. C. M. Arroyo.

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

307–308 Themes from Russian Culture 307, Fall; 308, Spring. 4 credits. 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.

367 The Russian Novel Spring. 4 credits. Also open to graduate students. There will be a special discussion section for students who read Russian, if they are Russian majors, they may count the course as one in the original language required for the Russian major.

368 Soviet Literature Spring. 4 credits. Also open to graduate students. There will be a special section for students who read Russian.

M 2:30-4:30 plus one hour to be arranged. Staff.

369 Dostoevsky (also Comparative Literature 383) Fall. 4 credits. W 2:30-4:30 plus one hour to be arranged. Staff.

370 Chekhov Fall. 4 credits. A special section is offered for students who read Russian; this section may be used toward the 12 credits of Russian literature in the original language required for the Russian major. T R 12-1:15. S. Senderovich.

379 The Russian Connection (also Comparative Literature 379) Spring. 4 credits. W 10-10. P. Garden.

670 Bakhit and the Russian Formalists (also Comparative Literature 670) Spring. 4 credits. Open to advanced undergraduates with permission of instructor. All readings in English. W 3:35. C. G. Emerson.

Akkadian

See Department of Near Eastern Studies.

American Studies


The Major

The major in American studies 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 specially designated 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, 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.

Honors. 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 themes and uniformities. Some anthropologists are concerned with cultures long gone or destroyed by the spread of empire. 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 symbolic 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--103), are intended to 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 (211) focuses on fundamental questions about the relationships between the biological and cultural facets of human nature. The other departmental courses broaden the perspectives anthropology has 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 Department of Anthropology holds colloquia throughout the academic year. Faculty members from Cornell and other universities participate in discussions of current research and problems in anthropology. Students are encouraged to attend. Anthropology majors have also established an anthropology club, which sponsors educational and social events 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).
M W F 12:20 M. LaVelle
The biocultural development of humans and the broad implications of human 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).
M W F 12:20 plus disc F 11:15, 12:20, or 2:30 D. H. Holmberg
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 systems in relief, will be developed. Fiction, films, and exercises supplement the formal anthropological materials.

121 Encounters with Other Cultures Spring. 3 credits. Freshman Seminar. Not offered 1985—86.

127 Anthropology of the Arts Fall. 3 credits. Freshman Seminar. Not offered 1985—86.

130 Apes and Languages Fall and spring. 3 credits. Freshman Seminar. Not offered 1985—86.

150 The Discovery of America Spring. 3 credits. Freshman Seminar. Not offered 1985—86.

205 Ethnographic Films Fall and spring. 2 credits. W 7:30—9:25 p.m. Fall. B. J. Isbells; spring, M. LaVelle
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 (e.g., 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).
M W F 1:25 P. S. Sangren
Cultural anthropology, because it encompasses the comparative study of man in society, provides a unique advantage 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 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).
M W F 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).
M W F 11:15 R. D. 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 1985—86.

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 2:30—4:25 P. S. Sangren, 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.

497 Social Relations Seminar (also Sociology 497) Spring. 4 credits. Limited to seniors majoring in social relations.
Hours to be arranged. Staff.

498 Topics in Anthropology 497, fall 498. Credit to be arranged.
Hours to be arranged. Staff.

1. Early People: The Archaeological and Fossil Record (also Archaeology 203) Fall. 3 credits.
T R 1—2 15 T. P. Olmman
A survey of the archaeological and fossil record of human evolution. Contributions by researchers from a variety of scientific disciplines are highlighted, as are the discoveries, personalities, and controversies that have enlivened the study of human evolution for more than a century. Critical evaluation of evidence and interpretations will be stressed. Laboratory sessions and films supplement the lectures.

2. Prehistoric Societies (also Archaeology 358) Spring. 4 credits.
M W F 2:30 J. S. Henderson
Prehistoric cultural developments in Mexico and Central America from the emergence of settled farming life in the Americas through the rise of states to the European conquest. Emphasis is on the Olmec, Maya, and Aztec civilizations.

3. Bible Archaeology in the Near East (also Archaeology 361) Spring. 4 credits. Prerequisite: permission of instructor.
T F Lych
Participation in archaeological surveys, excavation, and laboratory work in the Negev Desert, Egypt, and antiquities excavations in the Near East. Students will learn about the tools and methods of excavation and analysis of archaeological sites.

4. Field Archaeology in the Near East (also Archaeology 361) Spring. 10 credits. Prerequisite: permission of instructor.
T F Lych
Expedition to the Near East to work on an archaeological project in the Near East. Students will learn about the tools and methods of excavation and analysis of archaeological sites.

5. Archaeological Strategies (also Archaeology 361) Spring. 4 credits.
T F Lych
A seminar in the design of archaeological projects in the Near East. Students will learn about the tools and methods of excavation and analysis of archaeological sites.
by selecting specific written sources that are archaeologically pertinent. Ways of using archaeological and written data to test and extend the written material will be explored. Past archaeological contributions to the understanding of Andean institutions will also be examined.

[493 Seminar in Archaeology Fall. 4 credits. Not offered 1985–86.]

[494 Seminar in Archaeology Spring. 4 credits. Not offered 1985–86.]

IV. Biological and Ecological Anthropology

375 Ecology and Human Food Production Fall. 4 credits. TR 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 possible ways of doing so. This course will discuss the different kinds of behavior, morphological and physiological characteristics, and environments. Each food production system has different costs and 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 and 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, Fasts, and Fateme: Studies in Culture and Human Nutrition Spring. 4 credits. TR 1–2:15. M. LaVelle. This course explores the evolutionary history of food selection, preparation, production, and distribution, together with the biocultural 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 food, including religious, medical, and aesthetic ideals that influence the nutritional status of a particular society.

386 Culture and Human Disease (also Biology and Society 366) Fall. 4 credits. MWF 10:10. M. LaVelle. 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. TR 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 social and economic costs and benefits of human behavioral as well as morphological and physiological characteristics that 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, incitadence, territoriality, dominance and hierarchy, bonding, and sex-role differences.

V. Sociocultural Anthropology

222 Meaning across Cultures Spring. 4 credits. TR 10:10–11:25. J. A. Boon. Are societies machines, therapies, religions, dramas, stories, texts, games, aesthetic forms, structural codes? We assess such possibilities in anthropological views of different cultures. From cosmologies and ceremonies of trifling systems, to expressive genres of archaic hierarchies, to differentiated arts and sports of nation states. Principles of language and culture and symbolic interpretation are introduced.

228 Law and Culture Fall. 4 credits. Not offered 1985–86.

242 American Indian Philosophies I: Power and World Views (also Rural Sociology 242) Fall. 3 credits. T R 10:10–11:25. J. A. Boon. 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 role of the sexes in social, political, economic, ideological, and biological systems to emphasize the diversity in gender and sex-role definitions around the world.


326 Economic Anthropology Fall. 4 credits. MWF 10:10. P. S. Sangren. Economic anthropology is the study of the organization of production, distribution, and associated values in radically different primitive and peasant societies. The course introduces the major competing stances—formalist (neoclassical), substantivist, and Marxist—that have developed frameworks for analysis of exotic economic systems. Other topics include the integration of local communities with larger economic systems, the articulation of capitalist and noncapitalist modes of production, and a critique of theories of economic development from an anthropological perspective.

[329 Power and Culture Spring. 4 credits. Not offered 1985–86.]

367 American Indian Tribal Governments (also Rural Sociology 367) Fall. 4 credits. Not offered 1985–86.

[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 1985–86.]

244 Myth, Ritual, and Sign Fall. 4 credits. TR 1–2:15. J. T. Siegel. We will treat myth, ritual, and sign in their theoretical and practical dimensions, looking at them in the views of various social theorists and as described by ethnographers.

[427 The Anthropology of Everyday Life Fall. 4 credits. Not offered 1985–86.]

328 Spirit Possession, Shamanism, Curing, and Witchcraft (also Women's Studies 428) Spring. 4 credits. Enrollment limited to 20 students. MWF 9:10–10:25. D. H. Holmberg. The anthropological perspective of witchcrafts, shamanism, curing, and cults of spirit possession with special attention to the play 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 general problems in the study of women and gender and the anthropology of myth, ritual, and symbolism.

[428 The Anthropology of Everyday Life Fall. 4 credits. Not offered 1985–86.]

The course provides an opportunity for students to pursue interests derived from American Indian Philosophies in greater depth. The specific topics to be investigated will be selected by the students in consultation with the instructor before the beginning of the semester.

[451 Anthropolical Boundaries Fall. 4 credits. Not offered 1985–86.]

452 Portraits, Profiles, and Life Histories Spring. 4 credits. Enrollment limited. S-U grades strongly recommended.

T 10:10–12:05. R. Ascher

The goal is the creation, by each student, of a portrait, profile, or life history of one other person. Ideally, that other person should differ from oneself in background and age or in other significant ways. Freedom is granted—and experimentation is encouraged—in the form of observation, recording, and presentation. As a point of departure, a study is made of books such as Group Portrait with Lady and A Fortunate Man. Portraits on film include Sam and Frank Film. The photography of Arbus, the sculpture of Giacometti, and the painting of Katz are examined critically. The second half of the semester is devoted to one-hour critiques of the work of each student.

453 Visual Anthropology Fall and spring. 4 credits. Enrollment limited. S-U grades only.

T 2:30–4:25. R. Ascher

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 Tukuitico's The Palm-Wine Drinker!, 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 Spring. 4 credits. Not offered 1985–86.]

VI. Theory and History of Anthropology

306 Ethnographic Description Spring. 4 credits.

T R 10:10–11:25. J. T. Siegel

This course shows students the nature of ethnography by observing the ethnographer. The history of anthropology indicates that it is such practice, combined with ideas from outside the discipline, that has produced significant results. Our object of study is "learning at Cornell." We will describe the contexts of learning here. Aspects of life at Cornell may at first seem peripheral, such as boredom, music, fashion, and odds, will be looked at for the role they play in education. The interest of money and commodities will also be examined.

412 Contemporary Anthropological Theory Fall. 4 credits.

M W F 11:30. B. Lambert

A survey of the assumptions social anthropologists make concerning the nature of society and culture, and the explorations they have proposed for regularities in social behavior, values, and belief systems. Among the approaches considered are processual analysis, the use of the concept of transaction, the historical method, ethnonscience, and structuralism.

[414 Anthropology and History Spring. 4 credits. Not offered 1985–86.]

[417 Structuralism: For and Against Spring. 4 credits. Not offered 1985–86.]

[420 Development of Anthropological Thought Spring. 4 credits. Not offered 1985–86.]

VII. Area Courses

230 Cultures of Native North America Fall. 4 credits.

M W F 1:25. 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 316) Spring. 4 credits. (4 by arrangement with instructor). Not offered 1985–86.]

331 The United States Fall. 4 credits.

M W F 9:05. C. J. Greenhouse

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 Ethnohistory of the Andean Region Fall. 4 credits. Not offered 1985–86.]

334 Ethnology of Island Southeast Asia Fall. 4 credits.

R 8–9:55. J. T. Siegel

Peoples and cultures of Indonesia and the Philippines will be discussed, with a focus on politics in its linguistic dimensions, as well as economic and cultural processes.

[335 Ethnohistory of Mainland Southeast Asia Fall. 4 credits. Not offered 1985–86.]

[336 Ethnohistory of Oceania Fall. 4 credits. Not offered 1985–86.]

342 Culture and Societies of India, Nepal, and Sri Lanka Fall. 4 credits.

T R 1–2:15. D. H. Holmberg

This course is a general introduction to Hindu, Buddhist, tribal, and Islamic societies of South Asia, with particular attention to India, Sri Lanka, Nepal, and the Himalayan kingdoms. Through ethnographic, historic, and literary accounts, features of South Asian cultures and societies will be considered in contrast and dynamic communication. The course proceeds descriptively, working through myriad social, ritual, and mythic expressions, toward an understanding of variability in South Asian cultures and of comparative ethnology.

343 Religion, Family, and Community in China Spring. 4 credits.

M W F 10:10. P. S. Sangren

The course provides anthropological perspectives on family and kinship, religion and values, economy and polity, and social organization in China. Both traditional society and culture and transformations in the People's Republic of China are considered. A major goal of the course is to provide a deeper understanding of the social and cultural fabric of the world's largest and longest-lived civilization.

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 emphasized include the family, ancestor worship, community and social organization, and urbanism and modernization.

405 Peasants, Indians, and Conflict in Central America Fall. 4 credits.

M W F 11:15. P. R. Sullivan

This course will examine the cultural and social background of revolutionary warfare in Mexico and Central America, with particular emphasis upon sixteenth-century cases. The anthropological literature on the region's peasantry and Indians will be read for insights into the agrarian, ethnic, and interclass relationships underlying revolt and repression.

456 Mesoamerican Thought and Culture Spring. 4 credits. Not offered 1985–86.}

IX. Graduate Seminars

600-level courses are open to undergraduates who have fulfilled the prerequisites or by consent of the instructor.

Southeast Asia Seminar: Thailand; History, Religion, and Politics (Asian Studies 601)
Anthropometric Assessment (Nutritional Sciences 630)

[632 Andean Symbolism Fall. 4 credits. Not offered 1985–86.]

[633 Andean Research Fall or spring. 4 credits. Not offered 1985–86.]

634–635 Southeast Asia: Readings in Special Problems 634, fall; 635, spring. Credit to be arranged.

Hours to be arranged. M. L. Barnett, J. A. Boon, J. T. Siegel.

636 Cognition and Classification Spring. 4 credits. Not offered 1985–86.]

640–641 South Asia: Readings in Special Problems 640, fall; 641, spring. Credit to be arranged.

Hours to be arranged. D. H. Holmberg, K. S. March. Selected readings in society, religion, and culture in South Asia.

645 Japanese Ethnology Fall. 4 credits.

Hours to be arranged. R. J. Smith. This seminar is designed for advanced students who plan to conduct social science research in Japan. It deals with questions of historical continuity, the relationship of the individual to society, and the nature of contemporary Japanese social organizations. A reading knowledge of Japanese is strongly recommended.

651 Anthropological Boundaries: Graduate Spring. 4 credits. Not offered 1985–86.]

653 Myth onto Film (also Theatre Arts 653) Fall and spring. 4 credits. Open to undergraduates and graduate students with permission of the instructor.

Prerequisite: some knowledge of any one of the following: anthropology, film, graphics, drawing, and painting.

T 1:25–4:25, F. R. Ascher. 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 but are not thought of 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 Spring. 4 credits. Not offered 1985–86.]

663 Hunters, Gatherers, and the Origins of American Agriculture Fall. 4 credits. Prerequisites: Anthropology 356 or permission of instructor. Open to qualified undergraduates.

M 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 Fall. 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 1985–86.]

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


Archaeology is an interdisciplinary field at Cornell, which is one of the few universities in the United States to offer a separate archaeology major. Program faculty members, 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. Those with a fairly serious interest in the field, particularly prospective majors, are encouraged to take the optional one-hour section, Archaeology 101. This course covers the broadest range of archaeology in terms of area and time and deals with method as well as results. Archaeology 302, which considers archaeological concepts, research design, and reconstruction, is 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 in any of the categories below (totaling at least 30 credits, including "A" at the 300 level or above):
   - Theory and Interdisciplinary Approaches (B)
   - Old World Archaeology (C)
   - New World Archaeology (D)
2) 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 advisor 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 selected by her or her advisor. 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, Concentrators are eligible for Hirsch Scholarships in support of fieldwork.

Freshman Seminars

105 Archaeology as Heritage
Fall and spring. 3 credits. Freshman Seminar.
MWF 1:25. A. Wonderley.

106 Historical Archaeology
Fall and spring. 3 credits. Freshman Seminar.
MWF 1:25. A. Wonderley.

107 Current American Archaeology
Fall and spring. 3 credits. Freshman Seminar.
MWF 1:25. A. Wonderley.

A broad introduction to archaeology—the study of the material remains that answer questions about the human past. The history, methods, and theory 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 lectures by members of the Cornell Archaeology Program are an integral part of the course.

101 Introduction to Archaeology, Section
Spring. 1 credit. 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.

300 Individual Study in Archaeology and Related Fields
Fall and spring. Credit to be arranged.
Prerequisite: Archaeology 100 or permission of instructor.
Hours to be arranged. Staff
Students pursue topics of particular interest with the guidance of a faculty member.

B. Theory and Interdisciplinary Approaches

203 Early People: The Archaeological and Fossil Record (also Anthropology 203)
Fall. 3 credits. Prerequisite: permission of instructor.
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, perspectives, and controversies that have enlivened the study of human evolution for more than a century. Critical evaluation of evidence and interpretations will be stressed. Laboratory sessions and films supplement the lectures.

302 Approaches to Archaeology
Fall. 4 credits. Prerequisite: permission of instructor.
T R 2:30-4:25. T. P. Volman, J. S. Henderson.
An exploration of the intellectual framework of modern archaeology. The course examines theoretical orientations and the varieties of archaeological research design and practice, then considers interpretation and reconstruction. An undergraduate seminar especially recommended for archaeology majors but open to anyone with a serious interest in archaeology.

317 Method and Theory in Stone Age Archaeology
Fall. 4 credits. Not offered 1985–86.
T. P. Volman.
An introduction to research on the archaeological record of Stone Age peoples. Current multidisciplinary approaches and theoretical orientations are presented. Case studies are used to demonstrate excavation procedures, research design, and the potential of the long Stone Age record for providing information on the evolution of prehistoric lifeways and behaviors.

358 Archaeological Research Methods (also Anthropology 358)
Spring. 4 credits. Prerequisite: permission of instructor.
Hours to be arranged (off campus, in Chile).
T. F. Lynch.
Techniques of archaeological survey, excavation, and analysis and their theoretical foundations. A wide variety of methods and problems will be considered, with emphasis on situations encountered in South America.

〔Ancient Societies (Anthropology 216)〕Fall. Not offered 1985–86.
Interpretation of the Archaeological Record (Anthropology 352)
Fall. 4 credits.
M W 2:30 plus 50-minute sec to be arranged.
C. Morris.

Basic principles and procedures of archaeological data collection and analysis considered in the context of modern archaeological theory. Problems of sampling, the description and statistical treatment of artifacts, and the development of practical archaeological research designs are among the topics covered.

Investigation of Andean Institutions: Archaeological Strategies (Anthropology 435)
Fall. 4 credits. Prerequisite: Reading knowledge of Spanish.
Hours to be arranged. C. Morris.
A seminar considering the role of archaeology in the study of major questions regarding native Andean societies. Topics of current interest will be approached by selecting specific written sources that are archaeologically pertinent. Ways of using Andean archaeological data to test and extend the written material will be explored. Past archaeological contributions to the understanding of Andean institutions will also be examined.

〔Seminar in Archaeology (Anthropology 493)〕Fall. Not offered 1985–86.


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 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.

Problems in Archaeology: "Early Man" in America (Anthropology 664)
Fall. 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.

Dendrochronology of the Aegean (Classics 309)
Fall and spring. 4 credits. Limited to 10 students.
Prerequisites: Archaeology 100 or Classics 220, and permission of instructor.
M 12:20–2:15; two labs to be arranged.
P. I. Kuniholm.
Participation in a research project of dating wooden 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.

Geomorphology (Geological Sciences 345)
Fall. 4 credits. Prerequisite: Geology 102 or 201, or permission of instructor.
2 lcs. 1 lab. A. L. Bloom.
Origin of landforms and description in terms of structure, process, and stage.

〔Ceramics (History of Art 423)〕Fall.
Not offered 1985–86.

Seminar in Methods of Art History (History of Art 505)
Spring. 4 credits.
M 2:30–4:30. R. Calkins.
Some discussion of archaeological methods, as well as analysis of style, iconography, etc., of art in general.
C. Old World Archaeology

[309 Archaeology of Africa: From Human Origins to Iron Age States Not offered 1985—86.]

Seminar in the Architecture of the Classical World (Architecture 681) Fall. 4 credits. Prerequisite: Architecture 361 or permission of instructor.
R 2-4:25. M. Kubelik.
Issues in Greek and Roman architectural history. Specific topic to be announced.

Introduction to Classical Archaeology (Classics 220 and History of Art 220) Spring. 3 credits.
M W F 10:10. J. Coleman and teaching assistant. The archaeology of the ancient Greeks and Romans as seen from a critical perspective. Major developments in Classical archaeology will be traced from treasure hunting to modern scientific research. Examples illustrating various approaches will be chosen: the study of Greek and Roman pottery, the study of 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.

Minioan-Mycenaean Art and Archaeology (Classics 221 and History of Art 221) Fall.
3 credits.
The birth of civilization in Greece and the Aegean islands during the Bronze Age. The main focus is in the rise and fall of Minoan Crete and Mycenaean Greece. with consideration given to the nature and significance of Aegean interactions with Egypt; the Near East, and Anatolia. Topics also include Cyprus as an intermediary between the Aegean and the eastern Mediterranean, the effects of the volcanic eruptions of Santorini-Thera, and the evidence of Homer and the Greek myths.

[Archaeology in Action I (Classics 232) Fall. Not offered 1985—86.]

Archaeology in Action II (Classics 233) 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. Kuhinholm.
Objects from the Classical, Hellenistic, and Roman periods are "dug" out of Cornell basements, identified, catalogued, and photographed, and are considered in their appropriate historic, artistic, and cultural contexts.

Arts and Monuments of Athens (Classics 320 and History of Art 320) Spring. 4 credits. Prerequisite: Classics 220 or permission of instructor.
Recent developments in the Archaeology of Athens from the Geometric period to late antiquity. Topics will include consideration of the nature of Athenian society and an assessment of the influence of Athens on the rest of the Greek world and beyond.

[Archaeology of Cyprus (Classics 321 and History of Art 321) Not offered 1985—86.]

Greek Architecture (Classics 328) Not offered 1985—86.

Greek Sculpture (Classics 329 and History of Art 329) Not offered 1985—86.

Research Questions in Mediterranean Archaeology (Classics 450) Not offered 1985—86.

Seminar in Classical Archaeology (Classics 629) Not offered 1985—86.

Seminar in Classical Greek Archaeology: Graduate (Classics 630) Fall. 4 credits.
Greece in the fourth century B.C. Topics will focus on city and country life, the Panhellenic sanctuaries (including the recent excavation at Nemea), and the tombs and monuments of individuals, such as the so-called tomb of Philip II of Macedon.

Ancient Greece from Homer to Alexander (Highway 325) 4 credits. Fall.
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 are supplemented by a number of ancient inscriptions, coins, art, and architecture.

[Arts of the Roman Empire (History of Art 322) Not offered 1985—86.]

Painting in the Greek and Roman World (History of Art 323 and Classics 323) Not offered 1985—86.

Greek Vase Painting (History of Art 325) Not offered 1985—86.

Greek and Roman Coins (History of Art 327 and Classics 327) Not offered 1985—86.

Architecture of the Middle Ages (History of Art 332 and Architecture 382) Spring. 4 credits.
Discussion of some buildings involving analysis of architectural evidence.

[Seminar in Greek Sculpture (History of Art 431) Not offered 1985—86.]

The History and Archaeology of Ancient Israel to 450 B.C.E. (Near Eastern Studies 243) Spring. 4 credits.
A detailed survey of the history and archaeology of the land of Canaan from the traditional origins of the Israelite tribes in the early second millennium/middle Bronze Age (ca. 2000 B.C.E.) through the Babylonian exile to the arrival of Ezra and Nehemiah (ca. 450 B.C.E.). Lectures on, and discussions of, biblical and Near Eastern literary sources relating to the history of Israel, as well as an analysis of the archaeological evidence, will form the basis of the course.


History and Archaeology of Ebla (Near Eastern Studies 362 and Archaeology 362) Fall. 4 credits.
D. I. Owen.
For description see Department of Near Eastern Studies.


[The History and Archaeology of the Ancient Near East (Near Eastern Studies 366 and Archaeology 310) Not offered 1985—86.]

[History and Archaeology of Ancient Egypt (Near Eastern Studies 367) Not offered 1985—86.]

[Seminar in Syro-Palestinian Archaeology: The Israelite Conquest of Canaan (Near Eastern Studies 461) Not offered 1985—86.]

International Trade, Market, and Politics in the Ancient Near East (Near Eastern Studies 463 and Society for the Humanities 425) Fall. 4 credits.
R 2:30—4:15. G. Pettinato.
A seminar on the dynamics of international trade based on the study of international treaties, economic sources, and archaeological evidence. Factors such as political conditions, market forces, and sources of raw materials and manufactured goods and their relationship to the development of trade routes will be evaluated and discussed. Parallels will be drawn with developments in more recent periods in both the Near East and Western Europe.

D. New World Archaeology

361 Field Archaeology in South America (also Anthropology 361) Spring. 10 credits. Prerequisite: permission of instructor.
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 now-desert environment, seasonal transhumance and the development of institutionalized economic complementarity, and excavation of an irka tambu (way station). Students will learn diverse archaeological field methods by taking part in a regional research project.

[The Peoples of America (Anthropology 354) Not offered 1985—86.]

Archaeology of Mexico and Central America (Anthropology 355) Spring. 4 credits.
Prehistoric cultural developments in Mexico and Central America from the emergence of settled farming life through the rise of states to the European conquest. Emphasis is on the Olmec, Maya, and Aztec civilizations.

[The Archaeology of South America (Anthropology 356) Not offered 1985—86.]

Mesoamerican Thought (Anthropology 456) Fall. 4 credits.
An introduction to iconography and writing systems in ancient Mexico and Central America. Emphasis is on inscriptions and painted books as sources for the reconstruction of religion and history.

[Maya History (Anthropology 656) Not offered 1985—86.]

[The Discovery of America (Anthropology 666) Not offered 1985—86.]

Asian Studies

B. de Bary, chairperson and director of undergraduate studies (388 Rockefeller Hall, 256-5095).
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.
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 or 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.

Study Abroad

Cornell participates in the Inter-University Program in Chinese Language Studies in Taipei, which offers intensive training in advanced spoken and written Chinese. 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: 256-6225).

Freshman Seminars

Women and Social Transitions in the Twentieth Century Fall. 3 credits.

The course will examine primary and autobiographical works written by women during intense social transition in Asia, Europe, and America during the first half of the twentieth century. How have women’s perceptions of their roles in marriage and the family in society, and in history changed during periods of war, rapid industrialization, and revolution? What limitations have they experienced? How have they defined the tensions between feminism and more broadly defined movements for change such as socialism, trade unionism, and national liberation? Readings will include works by Han Suyin and Yuan-Tsung Chen (China), Yoshano Akiko and Ishimoto Shizue (Japan), Alexandra Kookostra (Soviet Union), Simone Weil and Simone de Beauvoir (France), and Emma Goldman and Agnes Smedley (U.S.A.).

Revolutions and Social Values in Modern Chinese Literature Spring. 3 credits. Not offered 1985–86.

E. M. Gunn.

Three Ways of Thought Fall. 3 credits.

MWF 9:05. T. L. Mei.

An introduction to Confucianism, Taoism, and Zen through reading and discussion of basic texts.

Feminine and Masculine Ideals in Japanese Culture (also Women’s Studies 105) Fall or spring. 3 credits.

MWF 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.

People and Culture in East Asia Fall. 3 credits. Not offered 1985–86.

Related Freshman Seminars in Other Departments

Japan and the West Fall. 3 credits. Not offered 1985–86. V Koschmann.

Art in a Landscape: The Traditional Arts of Southeast Asia Fall. 1985–86.

General Education Courses

Introduction to Japan Fall. 3 credits.

MWF 11:15; disc. F 9:05, 11:15, 12:20, or 1:25. Staff.

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.

Introduction to China Spring. 3 credits.

MWF 11:15; disc. F 11:15. B. MacDougal and staff.

An interdisciplinary introduction to Chinese culture especially designed for students not majoring in Asian studies.

Introduction to South Asian Civilizations Fall. 3 credits (4 credits with a special project; consult instructor for information).

MWF 11:15; disc. F 11:15. B. MacDougal 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.

Introduction to Asian Religions Fall. 3 credits.

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, Koson'), discussion will stress the relationships between the symbolic and mythological systems, as well as the rituals and the complex personalities of each tradition. Two guided papers.


Section 4: topic to be announced.


310 Readings in Korean Literature Spring. 3 credits. 
W 7:30 p.m. D. R. McCarran. 
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 kosa and sijo poems. Modern works will also 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. 3 credits. 
One optional viewing M 4:30, one required viewing W 4:30, one lecture, W 11:15; disc. M or F 11:15. B. deBary. 
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 film 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 and codes.

338 Japanese Theater (also Theatre Arts 338) 4 credits. Spring. 
A study of traditional forms of Japanese theater. Topics will include ritual theater, noh and kyogen, kabuki, and the puppet theaters, and contemporary theatrical use of tradition. Selected works will be placed on dramaturgy, acting styles, performance aesthetics, and theories of performer training.

351 The Religious Traditions of India Fall. 4 credits. 
T R 2:30–3:45. B. Faure. 
A study of the relationships between the main currents of Indian religion. The course will first 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 Tantra, as religious phenomena reflecting the emergence of individualism.

352 East Asian Buddhism Spring. 4 credits. No prerequisites: Asian Studies 250 or 351 strongly recommended. B. Faure. 
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.


373 Twentieth-Century Chinese Literature Spring. 4 credits. 
M W F 2:30. E. M. Gunn. 
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.

374 Chinese Narrative Literature Fall. 4 credits. 
M W F 1:25. E. M. Gunn. 
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 Prose and Poetry in Contemporary Japan Fall. 4 credits. 
M W F 11:15. B. deBary. 
The major Japanese novelists and short story writers of the twentieth century are studied in translation.


379 Southeast Asian Literature in Translation Fall or spring. 4 credits. 
Fall: M 3–5; spring: hours to be arranged. H. Meier. 
Fall topic: Indonesian and Dutch Literature, 1870–1930. A comparative study of selected works from metropolitan and colonial Dutch, as well as Indonesian, literatures in the later colonial period (1870–1930). The focus will be on the impact of colonial contact on respective literary forms and styles. 
Spring topic: Orality and Literacy in Malay Literature. This course will deal with the transformation of Malay literature as a consequence of the shift from oral to printed forms of expression and reproduction. Selected key works will be studied intensively in detail.

386 Folk Literature of East Asia Spring. 4 credits. Not offered 1985–86. 


Note: For complete descriptions of courses numbered 600 or above, consult the graduate faculty representative.

601 Southeast Asia Seminar: Thailand—History, Religions, and Politics Fall. 4 credits. Hours to be arranged. Visiting Professor Kasetsiri.

602 Southeast Asia Seminar: The Chinese in Southeast Asia Spring. 4 credits. Hours to be arranged. M. Barnett.

604 Southeast Asia Seminar Not offered 1995–86. 

607–608 The Plural Society Revisited (also Government 653–654) Fall, spring. 4, 6 credits. Only 607 may be taken independently for credit; 607 is a prerequisite for 608. Not offered 1985–86. B. Anderson. 

611 Chinese and Japanese Bibliography and Methodology Spring. 1 credit. Prerequisite: permission of instructor. Required of honors students and master of arts candidates. 
Sec 1 (Chinese), F 3:35–sec 2 (Japanese), F 1:25. Staff.

620–621 Seminar on South Asia 620, spring; 621, fall. 4 credits. For more information, contact the South Asia Program, 170 Uris Hall.

650 Seminar on Asian Religions Spring. 2–4 credits. Prerequisite: permission of instructor W 2–4. Staff.

676 Southeast Asia Research Training Seminar Contact the Southeast Asia Program, 120 Uris Hall, 256-2378, for more information.

701–702 Seminar in East Asian Literature Fall, spring. 1–4 credits. Hours to be arranged. Staff.

703–704 Directed Research Fall or spring. 1–6 credits. Prerequisite: admission to the honors program. The student, under faculty direction, prepares an honors essay.

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 or spring. 1–6 credits. Credit to be arranged. Prerequisite: permission of instructor. Open to majors and other qualified students.

405–606 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

Urban Anthropology (Anthropology 313) 
Meaning across Cultures (Anthropology 320) 
Histories of Ideas of Exotica (Anthropology 325) 
Balinese Culture: Discussion and Comparison (Anthropology 410) 
Hierarchies, Ritual, and History (Anthropology 611) 

Anthropological Approaches to the Study of Buddhism in Asia (Anthropology 619) 

Government and Politics of Southeast Asia (Government 344) Not offered 1985–86. 

Politics in Contemporary Japan (Government 346) Not offered 1985–86. 

Politics of Industrial Societies (Government 348) Not offered 1985–86. 

Political Role of the Military (Government 349) Not offered 1985–86. 

Comparative Revolutions (Government 350) 
The United States and Asia (Government 387) 
Field Seminar in International Relations (Government 606) 

Seminar in International Relations of Asia (Government 687)

Introduction to Asian Civilizations: Origins to 1600 (History 190)

Introduction to Asian Civilizations in the Modern Period (History 191)

Introduction to Art History: Asian Traditions (History of Art 280)

Buddhist Art in Asia (History of Art 381)

[Studies in Indian and Southeast Asian Art (History of Art 386) Not offered 1985–86.]

[Ceramic Art of Asia (History of Art 482) Not offered 1985–86.]

Problems in Asian Art (History of Art 580)

Related Courses in Other Colleges

The courses listed below will count as College of Arts and Sciences credit only for Asian studies majors.

Economics of Agricultural Development (Agricultural Economics 464)

Food, Population, and Employment (Agricultural Economics 660)

Food, Population, and Employment II (Agricultural Economics 661)

Architecture in Its Cultural Context (Architecture 667–668)

Communication in the Developing Nations (Communication Arts 624)

Applications of Sociology to Development Programs (Rural Sociology 751) Not offered 1985–86.]

China—Area Courses


Focusing on the economy of the People’s Republic of China but with reference to the experiences of Taiwan, Hong Kong, and Singapore, this course investigates current economic developments in light of China’s economic condition and post-1949 institutions and policies.

411 A Documentary Study of Contemporary China Spring. 3–4 credits. Hours to be arranged. J. Nickum.

An intensive analysis of the development of doctrine, institutions, and policies in the People’s Republic of China through study of many of the principal documents. The basic course will use English language translations, with an additional section for one credit for those who wish to read selections in Chinese.

Economic Anthropology (Anthropology 326)

Religion, Family, and Community in China (Anthropology 343)


[Chinese Government and Politics (Government 347) Not offered 1985–86.]

Comparative Revolutions (Government 350)

[The Foreign Policy of China (Government 390) Not offered 1985–86.]

[Readings on the Great Cultural Revolution (Government 447) Not offered 1985–86.]

[Chinese Political Readings (Government 448) Not offered 1985–86.]


[Politics of China (Government 645) Not offered 1985–86.]

[Readings from Mao Ze Dong (Government 651) Not offered 1985–86.]

[China and the West before Imperialism (History 193) Not offered 1985–86.]

Early Warfare, East and West (History 360)

[Art and Society in Modern China (History 390) Not offered 1985–86.]

History of China up to Modern Times (History 393)

The Role of Asia in Modern European Discourse on History and Subjectivity (History 490 and Society for the Humanities 421)

History of China in Modern Times (History 394)

Undergraduate Seminar in Medieval Chinese History (History 492)

[Self and Society in Late Imperial and Twentieth-Century China (History 493) Not offered 1985–86.]

[Art and Society in Modern China (History 499) Not offered 1985–86.]

Chinese Historiography and Source Materials (History 691)

Problems in Modern Chinese History (History 693–694)

[Seminar in Medieval Chinese History (History 791–792) Not offered 1985–86.]

Seminar in Modern Chinese History (History 793–794)

[Introduction to the Arts of China (History of Art 380) Not offered 1985–86.]

The Arts of Early China (History of Art 383)

[Chinese Painting (History of Art 385) Not offered 1985–86.]

[The Arts of Southeast Asia (History of Art 396) Not offered 1985–86.]

[The Arts in Modern China (History of Art 481) Not offered 1985–86.]

[Chinese Art of the T’ang Dynasty (History of Art 483) Not offered 1985–86.]

Studies in Chinese Painting (History of Art 486)

[The Western Discovery of Taoism and Zen Buddhism (Society for the Humanities 415)

Contemporary Chinese Society (Sociology 259)

Other courses dealing extensively with China are Anthropology 205 and 322; Architecture 667–668; Government 347, 348, 350, 381, 400, 446, 606, and 645; History 190 and 192; History of Art 280, 381, 482, 580, and 596; Management MBA 586; and Sociology 342.

China—Language Courses

Basic Course (Chinese 101–102)

Cantonese Basic Course (Chinese 111–112)

FALCON (full-time course, Chinese 161–162)

Intermediate Chinese I (Chinese 201–202)

Intermediate Cantonese (Chinese 211–212)

Intermediate Chinese II (Chinese 301)

Intermediate Chinese III (Chinese 302)

Chinese Conversation—Intermediate (Chinese 303–304)

Intermediate Cantonese II (Chinese 311–312)

History of the Chinese Language (Chinese 401)

Linguistic Structure of Chinese: Phonology and Morphology (Chinese 403)

Linguistic Structure of Chinese: Syntax (Chinese 404)

Chinese Dialects (Chinese 405)

Readings in Modern Chinese (Chinese 411–412)

Chinese Reading Tutorials (Chinese 413–414)

Chinese Dialect Seminar (Chinese 607)

China—Literature Courses

Introduction to Classical Chinese (Chinese 213–214)

Chinese Philosophical Texts (Chinese 313)

[Classical Narrative Texts (Chinese 314) Not offered 1985–86.]

Readings in Modern Chinese Literature (Chinese 411–412)

T’ang and Sung Poetry (Chinese 420)

Directed Study (Chinese 421–422)

[Readings in Literary Criticism (Chinese 424) Not offered 1985–86.]

[Readings in Folk Literature (Chinese 430) Not offered 1985–86.]

Seminar in Chinese Poetry and Poetics (Chinese 603)

Seminar in Chinese Fiction (Chinese 605)

Seminar in Folk Literature (Chinese 609)

Advanced Directed Reading (Chinese 621–622)

Japan—Area Courses

391 The Japanese Economy Fall. 4 credits.


An introduction to the world’s third-largest economy. Topics include the economic geography of Japan; premodern (shogunate) economic development; modernization, expansion, war, and occupation economies; government-business relations; industrial organization; and foreign trade. No prerequisites.

Japanese Society (Anthropology 345)

Japanese Ethnology (Anthropology 645)
Business and Labor in Politics (Government 334)
[Politics in Contemporary Japan (Government 346) Not offered 1985–86.]
Politics of Productivity: Germany and Japan (Government 430)
[Japan and the West (History 192) Not offered 1985–86.]
[State, Society, and Culture in Japan to 1750 (History 397) Not offered 1985–86.]
[State, Society, and Culture in Modern Japan (History 398) Not offered 1985–86.]
[War as Myth and History in Postwar Japan (History 399 and Asian Studies 381) Not offered 1985–86.]
[Seminar in Tokugawa Thought and Culture (History 488) Not offered 1985–86.]
[Seminar in Japanese Thought (History 797–798) Not offered 1985–86.]
[The Arts of Japan (History of Art 384) Not offered 1985–86.]

Other courses dealing extensively with Japan are
Japanese Conversation (Japanese 203–204) and 596; and Management NBA 586.
Family and Population in Japan (Sociology 442)
Japan: A Sociological Analysis (Sociology 257)
Women and Development in East Asia (Sociology 342)

Family and Population in Japan (Sociology 442)
Other courses dealing extensively with Japan are Anthropology 313; Architecture 667–668; Education 678; Government 334, 348, 387, 446, 605, and 606; History 190 and 192; History of Art 280, 381, 482, 580, and 596; and Management NSA 586.

Japan—Language Courses
Basic Course (Japanese 101–102)
Accelerated Introductory Japanese (Japanese 123)
Japanese for Business Purposes (Japanese 141–142)
FALCON (full-time intensive course, Japanese 161–162)
Intermediate Japanese I (Japanese 201–202)
Japanese Conversation (Japanese 203–204)
Intermediate Japanese I and Conversation (Japanese 205–206)
Transition to Intermediate Japanese Conversation (Japanese 223)
Intermediate Japanese for Business Purposes (Japanese 241–242)
Intermediate Japanese II (Japanese 301–302)
Japanese Communicative Competence (Japanese 303–304)
Advanced Japanese (Japanese 401–402)
Linguistic Structure of Japanese (Japanese 404)

Oral Narration and Public Speaking (Japanese 407–408)
Directed Readings (Japanese 421–422)
Introductory Japanese for Business Purposes (Japanese 541–542)
Intermediate Japanese for Business Purposes (Japanese 543–544)

Japan—Literature Courses
Introduction to Modern Literary Japanese (Japanese 405)
Introduction to Classical Japanese (Japanese 406)
Directed Readings (Japanese 421–422)
Seminar in Modern Literature (Japanese 611)
Seminar in Classical Literature (Japanese 612)
Advanced Directed Readings (Japanese 621–622)

South Asia—Area Courses
Cultures and Societies of India, Nepal, and Sri Lanka (Anthropology 342)
Anthropological Approaches to the Study of Buddhism in Asia (Anthropology 619)
Himalayan issues, Problems, and Prospects (Anthropology 623)
Directed Readings and Research in South Asia (Anthropology 640)
Architecture in Its Cultural Context (Architecture 667–668)
Introduction to South Asian Civilization (Asian Studies 215)
Introduction to Asian Studies (Asian Studies 250)
The Religious Traditions of India (Asian Studies 351)
South Asia Seminar (Asian Studies 620–621)
Communication in the Developing Nations (Communication Arts 624)

Government and Politics of India (Government 300)
India: Social and Economic Change in a Democratic Polity (Government 351)
The Role of Asia in Modern European Discourse on History and Subjectivity (History 490 and Society for the Humanities 421)
Buddhist Art in Asia (History of Art 381)
[Studies in Indian and Southeast Asian Art (History of Art 386) Not offered 1985–86.]
India as a Linguistic Area (Linguistics 342)
Dravidian Structures (Linguistics 400)
Indo-Aryan Structures (Linguistics 442)
Elementary Pali (Linguistics 640)
Elementary Sanskrit (Linguistics 641–642)
Directed Research (Linguistics 701–702)

性别与社会变迁 (Rural Sociology 625)
政策与规划评估 (Rural Sociology 675)
社会技术的灌溉 (Rural Sociology 754)
印度统治对英国自由主义的影响 (Society for the Humanities 423)

South Asia—Language Courses
Elementary Bengali (Bengali 121–122)
Intermediate Bengali (Bengali 211–212)
Basic Course (Hindi 101–102)
Hindi Reading (Hindi 201–202)
Composition and Conversation (Hindi 203–204)
Readings in Hindi Literature (Hindi 301–302)
Advanced Composition and Conversation (Hindi 305–306)
Basic Course (Nepali 101–102)
Continuing Nepali Conversation (Nepali 211–212)
Continuing Nepali Conversation (Nepali 213–214)
Basic Course in Sinhala (Sinhalese 101–102)
Sinhala Reading (Sinhalese 201–202)
Composition and Conversation (Sinhalese 203–204)
Basic Course (Tamil 101–102)
Basic Course (Telugu 101–102)
Telugu Reading (Telugu 201–202)

Southeast Asia—Area Courses
Sociotechnical Aspects of Irrigation (Agricultural Economics 754, Agricultural Engineering 754, and Rural Sociology 754)
[Ethnographic Description (Anthropology 306) Not offered 1985–86.]
Applied Anthropology (Anthropology 314 and Rural Sociology 355)
Meaning across Cultures (Anthropology 320)
Histories of Ideas of Exotica (Anthropology 325)
[Ethmology of Island Southeast Asia (Anthropology 334) Not offered 1985–86.]

South Asia—Area Courses
Cultures and Societies of India, Nepal, and Sri Lanka (Anthropology 342)
Anthropological Approaches to the Study of Buddhism in Asia (Anthropology 619)
Himalayan issues, Problems, and Prospects (Anthropology 623)
Directed Readings and Research in South Asia (Anthropology 640)
Architecture in Its Cultural Context (Architecture 667–668)
Introduction to South Asian Civilization (Asian Studies 215)
Introduction to Asian Studies (Asian Studies 250)
The Religious Traditions of India (Asian Studies 351)
South Asia Seminar (Asian Studies 620–621)
Communication in the Developing Nations (Communication Arts 624)

Government and Politics of India (Government 300)
India: Social and Economic Change in a Democratic Polity (Government 351)
The Role of Asia in Modern European Discourse on History and Subjectivity (History 490 and Society for the Humanities 421)
Buddhist Art in Asia (History of Art 381)
[Studies in Indian and Southeast Asian Art (History of Art 386) Not offered 1985–86.]
India as a Linguistic Area (Linguistics 342)
Dravidian Structures (Linguistics 400)
Indo-Aryan Structures (Linguistics 442)
Elementary Pali (Linguistics 640)
Elementary Sanskrit (Linguistics 641–642)
Directed Research (Linguistics 701–702)

Gender Relations and Social Transformation (Rural Sociology 625)
Politics of Policy Planning and Evaluation (Rural Sociology 675)
Applications of Sociology to Development Programs (Rural Sociology 751)
Sociotechnical Aspects of Irrigation (Rural Sociology 754)

Indian Impact on British Liberalism (Society for the Humanities 423)
Other courses dealing extensively with South Asia are Anthropology 321, 425, and 828; Agricultural Economics 464; Communication Arts 626; Government 387, 505, 606, and 667; History 190 and 191; History of Art 280, 482, 580, and 596; and Society for the Humanities 415.

South Asia—Language Courses
Elementary Bengali (Bengali 121–122)
Intermediate Bengali (Bengali 211–212)
Basic Course (Hindi 101–102)
Hindi Reading (Hindi 201–202)
Composition and Conversation (Hindi 203–204)
Readings in Hindi Literature (Hindi 301–302)
Advanced Composition and Conversation (Hindi 305–306)
Basic Course (Nepali 101–102)
Continuing Nepali Conversation (Nepali 211–212)
Continuing Nepali Conversation (Nepali 213–214)
Basic Course in Sinhala (Sinhalese 101–102)
Sinhala Reading (Sinhalese 201–202)
Composition and Conversation (Sinhalese 203–204)
Basic Course (Tamil 101–102)
Basic Course (Telugu 101–102)
Telugu Reading (Telugu 201–202)

Southeast Asia—Area Courses
Sociotechnical Aspects of Irrigation (Agricultural Economics 754, Agricultural Engineering 754, and Rural Sociology 754)
[Ethnographic Description (Anthropology 306) Not offered 1985–86.]
Applied Anthropology (Anthropology 314 and Rural Sociology 355)
Meaning across Cultures (Anthropology 320)
Histories of Ideas of Exotica (Anthropology 325)
Ethnology of Mainland Southeast Asia (Anthropology 335)

Balinese Culture: Description and Comparison (Anthropology 410)


Ritual Structures and Cultural Pluralism (Anthropology 425)

[Myth and Mythology (Anthropology 610) Not offered 1985–86]

Hierarchies, Ritual, and History (Anthropology 611)

Anthropological Approaches to the Study of Buddhism in Asia (Anthropology 619)


Southeast Asia: Readings in Special Problems (Anthropology 634–635)

Southeast Asian Literature in Translation (Asian Studies 379 and Comparative Literature 377)

Southeast Asia Seminar (Asian Studies 601) Fall. 4 credits. Visiting Professor Kasetsiri. Topic: Thailand—history, religions, and politics

Southeast Asia Seminar (Asian Studies 602) Spring. 4 credits. Topic: The Chinese in Southeast Asia


Southeast Asia Research Training Seminar (Asian Studies 676)

Directed Research (Asian Studies 703–704) 703, fall and spring. 704, fall and spring. Credit to be arranged.

Southeast Asia Undergraduate Seminar (Government 300) Not offered 1985–86.

[Government and Politics of Southeast Asia (Government 344) Not offered 1985–86.

The United States and Asia (Government 387)

[Political Anthropology: Indonesia (Government 647 and Anthropology 628) Not offered 1985–86.

International Relations of Asia (Government 687)

Introduction to Asian Civilization: Modern Period (History 191)

Southeast Asia to the Eighteenth Century (History 395)

Southeast Asian History from the Eighteenth Century (History 396)

Early Southeast Asia: Graduate Proseminar (History 955)

Modern Southeast Asia: Graduate Proseminar (History 966)

Seminar in Southeast Asian History (History 795–796)

[Art in Landscape: The Traditional Arts of Southeast Asia (History of Art 106) Not offered 1985–86.

[Introduction to Art History: Asian Traditions (History of Art 280) Not offered 1985–86.

Buddhist Art in Asia (History of Art 381)

[Studies in Indian and Southeast Asian Art (History of Art 386) Not offered 1985–86.

[Traditional Arts in Thailand (History of Art 388) Not offered 1985–86.

[Ceramic Art of Asia (History of Art 482) Not offered 1985–86.

Studies in Asian Art (History of Art 580)


Farming Systems Research (International Agriculture 606)

Comparative Methodology (Linguistics 404)


Field Methods (Linguistics 600)

Old Javanese (Linguistics 651–652)

Seminar in Southeast Asian Languages (Linguistics 653–654)

Malayo-Polynesian Linguistics (Linguistics 655–656)


A Survey of Tone and Tonal Phenomena (Linguistics 700)

Directed Research (Linguistics 701–702)

Thai Dialectology (Linguistics 751)

Comparative Thai (Linguistics 752)

Tibeto-Burman Linguistics (Linguistics 753)


History, Theory, and Practice of Gamelan (Music 245–246)

Cornell Gamelan Ensemble (Music 445–446)

Introduction to Ethnomusicology (Music 680)

Rural Sociology and World Development Problems (Rural Sociology 205)

Rural Development and Cultural Change (Rural Sociology 355)

[Subsistence Agriculture in Transition (Rural Sociology 357) Not offered 1985–86.

Sociotechnical Aspects of Irrigation (Rural Sociology 754, Agricultural Economics 754, and Agricultural Engineering 754)

Special Seminar: Refugees' Resettlement and Development (Rural Sociology 771)

Race and Ethnicity (Sociology 364)

Social Demography (Sociology 430)

Social and Demographic Change in Southeast Asia (Sociology 439)

Other courses dealing with Southeast Asia are Agricultural Economics 701, Agricultural Engineering 754 and 771, Agronomy 314, 471, and 483, Anthropology 420; Architecture 667–668; Asian Studies 250, 351, 352, and 650; Education 665, 782, and 783; Government 692; History 190; International Agriculture 603, 606, and 703; Nutritional Sciences 680 and 695; Rural Sociology 430, and Society for the Humanities 415.

Southeast Asia—Language Courses

Basic Course (Cambodian 101–102)

Cambodian Reading (Cambodian 201–202)

Composition and Conversation (Cambodian 203–204)

Advanced Cambodian (Cambodian 301–302)

Directed Individual Study (Cambodian 401–402)

Basic Course (Cebuano [Bisayan] 101–102)

Elementary Course (Indonesian 101–102)

FALCON (full-time intensive course, Indonesian 161–162)

Indonesian Reading (Indonesian 201–202)

Composition and Conversation (Indonesian 203–204)

Linguistic Structure of Indonesian (Indonesian 300)

Readings in Indonesian and Malay (Indonesian 301–302)

Advanced Indonesian Conversation and Composition (Indonesian 303–304)

Directed Individual Study (Indonesian 305–306)

Advanced Readings in Indonesian and Malay Literature (Indonesian 401–402)

Elementary Javanese (Javanese 131–132)

Intermediate Javanese (Javanese 133–134)

Directed Individual Study (Javanese 203–204)

Basic Course (Tagalog 101–102)

Tagalog Reading (Tagalog 201–202)

[Linguistic Structure of Tagalog (Tagalog 300) Not offered 1985–86.

Basic Course (Thai 101–102)

Thai Reading (Thai 201–202)

Composition and Conversation (Thai 203–204)

Advanced Thai (Thai 301–302)
116 Arts and Sciences

Thai Literature (Thai 303–304)

Directed Individual Study (Thai 401–402)

Basic Course (Vietnamese 101–102)

Vietnamese Reading (Vietnamese 201–202)

Composition and Conversation (Vietnamese 203–204)

Advanced Vietnamese (Vietnamese 301–302)

Directed Individual Study (Vietnamese 401–402)

Astronomy

Y. Terzian, chairman and director of undergraduate studies (428 Space Sciences Building 256-4935);

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. 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 110 or 112. This is somewhat less intensive than the 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 Universe beyond the Solar System Fall. 4 credits. Prerequisites: basic course or coregistration in Mathematics 111 or 191. Lecs., M. W. F 11:15; lab, M. W. F 7:30–10 p.m., or T W 2:30–5 p.m. One lab every other week, rec., one hour alternate weeks. J. R. Houck, Labs, P. M. Haynes.

An examination of the universe and our place in it, and the possible existence of life and intelligence elsewhere in the cosmos. The physical 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 interstellar material on the evolution of our galaxy. An introduction to the special and general theories of relativity. Modern theories of the structure and evolution of the universe.

102 Our Solar System Spring. 4 credits. Prerequisites: Introductory calculus or coregistration in Mathematics 111 or 191. Lecs., M. W. F 10:10, rec., one hour each week to be arranged; some evening labs to be arranged. P. J. Giersch. The origin of the solar system. Celestial mechanics. The physics and chemistry of planetary surfaces, atmospheres, and interiors. Spacecraft results. Prebiology, and the origin of life. The search for life elsewhere in the universe.

201 Our Home in the Universe Fall. 2 credits. Prerequisites: Introductory calculus or coregistration in Mathematics 111 or 191. Lecs., M. W. F 10:10, rec., one hour each week to be arranged; some evening labs to be arranged. P. J. Giersch. 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. Not offered 1985–86.

315 The Course of Science Fall. 4 credits. Prerequisites: Introductory calculus or coregistration in Mathematics 111 or 191. Lecs., M. W. F 11-1/3; M. O. Harwit. The development of the scientific discipline—astronomy—is traced in detail from mythology in primitive cultures to quantitative theory tied in to a larger-scale structure of theoretical physics today. The role of novel ideas, physical and mathematical tools, and religious, social, military, and other factors is analyzed. Comparative developments in other branches of the sciences in recent centuries, as well as the evolution of astronomy in isolated portions of the world in earlier millennia, are traced to provide a measure of the leeway encountered in the evolution of science.


431 Introduction to Astrophysics and Space Sciences Fall. 4 credits. Lecs., M. W. F 10:10; J. M. Cordes. 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. Lecs., M. W. F 10:10. M. O. Harwit. 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.

433 The Sun Spring. 4 credits. Not offered 1985–86.
An introduction to the physical and chemical processes that have been active in altering the environments of planets and satellites from their original to their present state. Theories of the formation of the solar system are revealed, with special emphasis on chemical differentiation in the meteorites. In what form was it during the formation process of the planets? What carbon-bearing substances were included and what fluids have come to the surfaces of the terrestrial planets to enrich them with carbon? Is there any relation between the primary carbon supply to the Earth and the carbonaceous deposits we find in the crust? Have upwelling carbon fluids facilitated the processes that gave rise to life?

509 General Relativity (also Physics 553) Fall. 4 credits. Not offered 1985—86.

510 Applications of General Relativity (also Physics 554) Spring. 4 credits. Not offered 1985—86.


520 Radio and Radar Astronomy Fall. 4 credits. T R 2:30—3:45. J. M. Cordes, M. P. Haynes. Radio astronomy telescopes and electronics; antenna theory; observation techniques and data analysis; concepts of interferometry and aperture synthesis.


523 Signal Processing in Astronomy Spring. 4 credits. Not offered 1985—86.

555 Theory of the Interstellar Medium (also Physics 665) Fall. 4 credits. Not offered 1985—86.

560 Theory of Stellar Structure and Evolution (also Physics 667) Fall. 4 credits. M. W. F. 1:25. E. E. Salpeter. Summary of observational facts on stars; dimensional analysis; nuclear reactions and energy transport in stellar interiors; models for black hole and evolving stars. At the level of Principles of Stellar Evolution and Nucleosynthesis, by Clayton.

570 Physics of the Planets Fall. 4 credits. H. T. R. to be arranged. P. D. Nicholson. An introductory survey of planetary science, with an emphasis on the application of physical principles. Recent observational results, including those of ground-based optical, infrared, radio, and radar astronomy, as well as those made by spacecraft, with satellite orbits, tidal interactions, and ring dynamics. An introduction to the theory of planetary interiors, gravitational and magnetic fields, heat sources, and chemical composition. Physics and chemistry of planetary atmospheres, radiative transfer, convection, thermal structure, and dynamics. Planetary magnetospheres. Intended for students in astronomy, physics, and engineering.


575 Planetary Atmospheres Spring. 4 credits. Not offered 1985—86.

579 Celestial Mechanics (also Theoretical and Applied Mechanics 67) Fall. 3 credits. Not offered 1985—86.

590 Galaxies and the Universe Fall. 4 credits. Not offered 1985—86.

599 Cosmology Spring. 4 credits. Prerequisites: statistical physics, quantum mechanics, electromagnetism. Prior knowledge of general relativity would be useful but is not essential. Hours to be arranged. J. M. Wasserman. This course is intended to provide a detailed theoretical development of current ideas in cosmology. Topics will include observational overview; growth of irregularities, galaxy formation; big bang cosmology, recombination, nucleosynthesis; very early universe, symmetry breaking, inflationary scenarios. At the level of Peebles, Physical Cosmology, and The Large Scale Structure of the Universe.


621 Seminar: Planetary Radar Astronomy Spring. 3 credits. Not offered 1985—86.

623 Seminar: Advances in Infrared Astronomy Fall. 2 credits. Hours to be arranged. J. R. Houch. Most of the course will be devoted to results and interpretation of recent observations, including the findings of the Infrared Astronomical Satellite. Modern techniques and their limitations will be briefly discussed.

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.

660 Cosmic Electrodynamics (also Applied and Engineering Physics 608) Spring. Not offered 1985—86.

671 Seminar: Scientific Findings by spacecraft in the Outer Solar System Fall. 3 credits. Prerequisites: permission of instructor. Hours to be arranged. C. E. Sagan. A research-level seminar on recent and forthcoming investigations, especially by spacecraft, in the outer solar system. Topics will include Titan organic aerosols, infrared bands in the spectra of Neptune, Uranus, Neptune, Pluto, putative oceans on Titan and Triton, and the physics and chemistry of cometary nuclei.

671 Seminar: Halley’s Comet Spring. 3 credits. Prerequisite: permission of instructor. Hours to be arranged. J. M. Cordes. The course will review our observations of comets in general and Comet Halley in particular. A major focus will be new results about Halley obtained during the 1985—86 apparition. The course will also discuss many aspects of Halley, including its past, present, and future behavior, and fate. A variety of reasons have been suggested for the apparent cometary activity, although none are yet proven. The topics covered will include cometary activity, theories of cometary origin, and the role of Halley’s comet in astronomical history.

673 Seminar: Remote Sensing Spring. 2 credits. Prerequisite: permission of instructor. Hours to be arranged. P. J. Glaeser. During spring 1986 this course will deal with remote sensing of planets and their atmospheres and the associated problems that arise in inverse theory. Among the topics to be discussed are retrieval of temperature profiles and composition profiles, measurement of flow velocities, energy balance recovery, surface property measurements, and internal mass distribution determinations. Errors and uniqueness of inverse methods will be quantitatively investigated.


690 Seminar: Computational Astrophysics Fall. 3 credits. Prerequisite: working knowledge of Fortran. Only those students who have completed the fundamental graduate physics courses should consider attending.

860 Seminar: Planetary and Interplanetary Exploration Fall. 3 credits. Prerequisite: permission of instructor. The seminar will be devoted to a discussion of recent developments in planetary and interplanetary exploration. The focus will be on the results of recent missions to the inner and outer planets, as well as on the implications of these results for our understanding of the solar system.

699 Seminar: Topics in Theoretical Astrophysics Fall. Not offered 1985—86.

Biological Sciences

G. W. G. Sharp, director (200 Simpson Hall, 256-2376); H. T. Stinson, associate director and director of undergraduate studies (118 Simpson Hall, 256-5233); S. D. Miller, assistant director for academic affairs/ student services (Biology Center, 220 Simpson Hall, 256-3358).

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.

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; developmental biology; and evolutionary 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 marine sciences may consult the Cornell Marine Programs Office (G44 Silliman Hall, 256-3717) for academic advice and career counseling. For more details see the section in this catalog on the Division of Biological Sciences.

Burmese, Cambodian, and Cebuano (Bisayan).

See Modern Languages, Literatures, and Linguistics.

Chemistry


The chemistry department offers a full range of courses in physical, organic, inorganic, analytical, theoretical, bioorganic, and biophysical chemistry. In addition to their teaching responsibilities, chemistry faculty members have active research programs. 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. Students not planning graduate work in chemistry may elect to extend it substantially in whatever direction suits their interests. Students going on to do graduate work in chemistry are encouraged to take mathematics courses such as Computer Science 100. The prerequisites for admission to a major in chemistry are (1) Chemistry 207-208, plus 300, (2) Physics 207, and (3) Mathematics 111 or 191. Students are not encouraged to undertake a major in chemistry, unless they have passed those prerequisite courses at a good level of proficiency. Knowledge of simple computer programming is essential to this major. This may be achieved either by self-study (a syllabus is available) or by taking courses such as Computer Science 100. The minimum additional courses that must be completed for a major in chemistry are (1) Chemistry 301, 302, 303, 359-360 (or, if necessary, 357-358 may be substituted), and 389-390 or (2) Mathematics 112 plus 213, or 122 plus 221, 222, or 592 plus 293, 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 extremely important that those going on to do graduate work in chemistry recognize that these requirements are minimal, and such students are strongly urged to supplement their programs. Where possible, with Chemistry 405, 460, 605, 606, 686, 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 graduate work in chemistry. Prospective candidates should complete the introductory organic chemistry and physical chemistry sequences by the end of the junior year. However, failure to have completed those courses before the junior year is not disqualifying. 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 who are 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 are encouraged to 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 first laboratory session. Those who fail to cooperate with the laboratory 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, 104, spring, 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 more mathematical course than Chemistry 207–208. Not recommended for students who plan to do further work in chemistry subsequent to Chemistry 104.

Lecs., M W T Th 2–4:20, lab, T or R 8–11, or F 10–11, or 10–11, or M W or F 1:25–4:25, Prelims. 7:30–9 p.m. oct. 8, nov. 12, March 6, April 17. Fall: G. G. Hammes; spring: M. Silvestri. An introduction to chemistry, with emphasis on the important principles and facts of inorganic and organic chemistry.

207–208 General Chemistry 207, fall; 208, spring, 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, fall; 208, spring.

Lecs: fall, T R 9:05, 10:10, or 12:20, spring, T R 9:05 or 10:10. Lab: fall, T W R or M 8–11; F 10–11; 10–11; or M W or F 1:25–4:25, spring, M T W R or F 12:20–4:25 or S–T–P. Prelims: 7:30–9 p.m. oct. 1, Nov. 5, March 4, April 15. Fall: B. Widom, M. E. Fisher; spring: R. C. Fay. 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. Second-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.

215–216 General Chemistry and Inorganic Qualitative Analysis 215, fall, 216, spring. Fall, 4 credits; spring, 3 credits. Recommended for students who intend to specialize in chemistry or in closely related fields. Enrollment limited. Prerequisites: good performance in high school chemistry and physics and in mathematics SAT. Corequisite: a calculus course at the level of Mathematics 111 or 191 for students who have not taken high school calculus. Prerequisite for Chemistry 216. Chemistry 215.

251 Introduction to Experimental Organic Chemistry

Fall. 2 credits. Recommended for non-chemistry majors. Prerequisite or corequisite: Chemistry 253 or permission of instructor. Laboratory work includes a brief introduction to the organic chemistry of biological systems, and study of the more important classes of carbon compounds—reactions of their functional groups, methods of synthesis, relations, and uses.

252 Elementary Organic Chemistry

Spring. 2 credits. Recommended for non-chemistry majors. Prerequisite: Chemistry 251. A continuation of Chemistry 251.

253 Elementary Organic Chemistry

Fall. 4 credits. Primarily for students in the premedical and biological curricula. Limited to 480 students. Prerequisite: Chemistry 104 with grade of C or better or Chemistry 208 or 216. Lecs, M W F 10 to 10, makeup lc may be given in the evening. Prelims: 7:30-9 p.m. Sept 26, Oct 24, Nov 19. D. Collum. The occurrence and properties of organic molecules and the mechanisms of organic reactions, including a brief introduction to the organic chemistry of biological systems, are studied.

255 Elementary Organic Chemistry

Fall. 2 credits. Same course as Chemistry 253, but to be taken for reduced credit by students already having 3 credits for Chemistry 357.

287--288 Introductory Physical Chemistry

287 fall: 288, spring. 3 credits each term. Prerequisites: Chemistry 208 or 216 and Mathematics 111-112, or permission of instructor. Prerequisite for Chemistry 288: Chemistry 287.


289--290 Introductory Physical Chemistry Laboratory

289, fall, 290, spring. 2 credits each term. Prerequisite for Chemistry 290: Chemistry 289. Corequisite: registration in Chemistry 287--288. Lecs, R 1:25, lab, M or W 1:25--4:25; Prelims: 7:30--9 p.m., Oct. 1, Nov. 5. Fall: H. A. Scheraga; Spring: R. F. Porter. Laboratory work, planned in consultation with a faculty member.

357--358 Introductory Organic Chemistry

357. Fall: 358, spring. 4 credits each term. Prerequisite: Chemistry 257: Chemistry 208 or 216 or advanced placement; recommended: concurrent registration in Chemistry 251. Prerequisite for Chemistry 358: Chemistry 357; recommended: concurrent registration in Chemistry 301. Lecs, M W F 9:05; lab, M W F 1:25--4:25 or T R 8--11 or 1:25--4:25. H. D. Aburía. An introduction to the techniques of vacuum line construction and operation, the principles and assembly of electronic measuring devices, optics, and kinetics.

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 206 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 lc s, W 7:30 p.m. Fall: C. F. Wilcox; spring: J. C. Clardy. A rigorous and systematic study of organic and organometallic compounds, their structures, the mechanisms of their reactions, and the ways that 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 206; Chemistry 201 or permission of instructor. Prerequisite for Chemistry 390: Chemistry 389.

Lecs, M W F 10:10; rec. and makeup lecture, W 7:30 p.m. Prelims: 7:30--9 p.m., Sept. 17, Oct. 8, Nov. 29.

26, Feb. 18, March 13, April 15, May 8. Fall: H. A. Scheraga; spring: E. R. Grant, P. H. Local. 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 252 and 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. Blec, first week only, at times to be arranged. J. M. Buritch. 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.
600–601 General Chemistry Colloquium 600, fall; 601, spring. No credit. Required of all graduate students except those majoring in organic or bioorganic chemistry. Juniors and seniors are encouraged to attend.

R. A. 100. G. H. Morrison

A series of talks representative of all fields of current research other than organic chemistry 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, Schönland’s Molecular Symmetry, and Hall’s Group Theory and Symmetry in Chemistry. Applications include molecular orbital theory, hybridization, and ligand field theory. Readings in the chemistry of nontransition 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. Prerequisite: Chemistry 605 or permission of instructor.
Lecs, M W F 10:10. K. H. Theopold


607 Advanced Inorganic Chemistry III: Structure and Properties Spring. 4 credits. Prerequisite: Chemistry 605 or permission of instructor. Not offered 1985–86.
Lecs, M W F 9:05.

The third of a three-term sequence. Introduction to ligand fields, crystal chemistry, 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.
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 Fall. 4 credits. Open to undergraduates with permission of instructor. Prerequisite: Chemistry 288 or 390 or equivalent.
Lecs, M W F 8: exams, T 7:30 p.m. W. D. Cooke

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.
Lecs, T R 10:10. problem sessions and exams, T 7:30 p.m. F. W. McLaugherty

Modern analytical methods, including electron, mass, and Fourier spectroscopy, mass spectroscopy, 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. Offered alternate years.
Lecs, T R 10:10. G. H. Morrison

Modern trace, micro, and surface methods of analysis, including atomic spectrometry, solid mass spectrometry, infrared spectroscopy, microprobes, and electron spectroscopy.]

629 Electrochemistry Fall. 3 credits. Primarily for graduate students and upperclass undergraduates. Prerequisite: Chemistry 390 or equivalent (Mathematics 213 helpful). Not offered 1985–86.
Lecs, T R 8:30–10. H. Abruña

Fundamentals of electrochemistry. Topics will include the fundamentals of electrode kinetics, electron transfer theory, the electrical double layer, and diffusion. A wide range of techniques and their application as well as instrumental aspects will be covered.

650–651 Organic and Organometallic Chemistry Seminar 650, fall; 651, spring. No credit. Required of all graduate students majoring in organic or bioorganic chemistry. Juniors and seniors are encouraged to attend.

665 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; makeup lectures and exams, W 7:30 p.m. B. K. Carpenter

A survey of reaction mechanisms and reactive intermediates in organic chemistry. Applications of qualitative molecular orbital theory are emphasized.

666 Synthetic Organic Chemistry Spring. 4 credits. Primarily for graduate students and upperclass undergraduates. Prerequisites: Chemistry 665 or permission of instructor.
Lecs, T R 8–9:30. B. Ganem

Modern techniques and applications of organic reaction mechanisms to the problems encountered in rational multiplet synthesis, with particular emphasis on modern developments in synthetic design.

[668 Chemical Aspects of Biological Processes Fall. 4 credits. Prerequisites: Chemistry 358 or 360, and 390 or 288 or equivalents. Not offered 1985–86.
Lecs, M W F 10

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.
Lecs, M W F 9:05 and occasionally W 7 p.m. B. A. Bird

Protein structure and dynamics, steady-state and transient kinetics; binding isotherms; chemical modification enzymes; application of NMR, EPR, and fluorescence; acid-base catalysis; allostery; discussion of specific enzymes to illustrate general principles.

[677 Chemistry of Nucleic Acids Fall. 4 credits. Primarily for graduate students. Prerequisites: Chemistry 358 or 360, and 390 or equivalents. S-U grades only. Not offered 1985–86.
Lecs, M W 10–11: 10. D. A. Usher

Properties, synthesis, reactions, and biochemical reactions of nucleic acids.]

678 Thermodynamics Spring. 4 credits. Primarily for graduate students. Prerequisite: Chemistry 288 or 390 or equivalents.
Lecs, T R 8:30–9:55. B. Widom

Principles of equilibrium thermodynamics, Thermodynamic functions; First and Second Laws; gases and condensed phases; solutions; phase equilibria; chemical thermodynamics; electrolytes; statistical thermodynamics.

681 Physical Chemistry I Fall. 4 credits. Prerequisites: Chemistry 288 or 390. Mathematics 213 and Physics 208; 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 elementary valence theory. At the level of Atoms and Molecules, by Kasu and Porter.

[686 Physical Chemistry of Proteins Spring. 4 credits. Primarily for graduate students.
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, 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: Stuart A. Rice, University of Chicago.

701–702 Introductory Graduate Seminar in Analytical, Inorganic, and Physical Chemistry 701, fall; 702, spring. No credit. Required of all first-year graduate students majoring in analytical, inorganic, physical, theoretical, and biophysical chemistry.
Lecs, T R 12:20.

716 Selected Topics in Advanced Inorganic Chemistry Fall. 3 credits. Prerequisite: Chemistry 390 or equivalent. Not offered 1985–86.
Lecs, T R 12:20.

755 Physical Organic Chemistry I Spring. 4 credits. Primarily for graduate students. Prerequisite: Chemistry 665 or permission of instructor.
Lecs, M W F 11:15. C. F. Wilcox

Continues and extends the approach of Chemistry 665 to more complex organic reactions. Emphasis is on applications of reaction kinetics and isotope effects to gain an understanding of reaction mechanisms.

[766 Physical Organic Chemistry II Spring. 3 credits. Primarily for graduate students. Prerequisite: Chemistry 765 or permission of instructor. Not offered 1985–86.

Quantitative aspects of organic chemistry.]
X-ray Crystallography

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.

Spectroscopy

Fall. 4 credits. Prerequisites: Chemistry 793, Physics 443, or equivalent.
Lecs, MWF 9:05. A. C. Albrecht.
Principles of linear and nonlinear atomic and molecular optical spectroscopies. Light-matter interaction, including relaxation phenomena, will be examined within the density matrix formalism. Topics drawn from the current literature will be concerned with coherence and incoherence, high light intensities, and ultrashort light pulses.

Quantum Mechanics I

Fall. 4 credits. Prerequisites: Chemistry 681, coregistration in Mathematics 421, and Physics 431 or equivalents or permission of instructor.
Schrödinger's equation, wave packets, uncertainty principle, WKB methods, atomic mechanics, orbital and spin angular momentum, exclusion principle, perturbation theory, variational principle, Born-Oppenheimer approximation. At the level of Bohm's Quantum Theory.

Quantum Mechanics II

Spring. 4 credits. Prerequisites: Chemistry 793 or equivalent and coregistration in Physics 432 and Mathematics 422, or permission of instructor.
Lecs, MWF 9:05. G. S. Ezra.
Time-dependent phenomena in quantum mechanics and interactions in quantum field theory. Group theory and applications in molecular spectroscopy and electronic structure of atoms and molecules. At the level of Weissbluth's Atoms and Molecules.

Statistical Mechanics (also Physics 562)

Spring. 4 credits. Primarily for graduate students. Prerequisite: Chemistry 793 or equivalent.
Ensembles and partition functions; fluctuations. Thermodynamic properties of ideal gases and crystals; Third Law; chemical equilibrium; Imperfect gases; correlation functions; liquids. Phase transitions; Ising models and lattice gases; Ideal quantum gases; Bose-Einstein condensation. At the level of McQuarrie's Statistical Mechanics.

Selected Topics in Physical Chemistry

Spring. 3 credits. Prerequisite: Chemistry 793 or equivalent; Chemistry 794 recommended but not essential.
Topics vary. In spring 1986 the topic will be principles of magnetic resonance.

Chinese

See Department of Asian Studies and Modern Languages, Literatures, and Linguistics.

Classics

Sir Kenneth Dover, A. D. White Professor-at-Large, A. L. Ford, Melton Fellow, G. Viastos, 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 widely viewed as an excellent 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, 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 Classics majors from Cornell have gone on to a wide variety of careers. In law, federal and military service, 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 treeing 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 and seminars in English on such subjects as Greek mythology, Greek and Roman mystery religions, 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 usage, 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 authors 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) coursework in Latin and Greek at the level of elementary proficiency in either; (b) 24 credits selected from the courses listed under Classical civilization, Classical archaeology, Latin, and Greek; and (c) 15 credits in related subjects (courses in the humanities 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 Intercollegiate 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 during orientation week or, if necessary, in the second half of the fall term.

Classical Civilization

MWF 9:05. G. M. Messing.
An introduction to the civilization of the Romans as offered in 1985-86. 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. 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: Roman Satire Fall. 3 credits. M.W.F. 11:15. D. Mankin. The ancient Romans invented satire as a type of literature, and its main exponents, the poets Horace and Juvenal, had great influence on the Western literary tradition. In this course we will focus on the Satires of Horace and Juvenal and explore how the two poets, each in different ways, used satire as a vehicle for criticism of society, private morality, and literature itself. We will also read works by later authors influenced by Horace and Juvenal and discuss, for the sake of comparison and contrast, current uses of satire, especially in popular media. Besides Horace and Juvenal, the readings will include selections from satirists ranging from Jonathan Swift to Mark Twain. Assignments will include critical papers on the readings, as well as the composition of satires (in prose or verse). Standing on the student's inclinations), in the manner of the two Roman poets, on contemporary subjects.

121 Freshman Seminar in Classical Archaeology Fall or spring. 3 credits. Fall: M.W.F. 12:20; spring: M.W.F. 9:05. 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 Mythology 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 for those seeking to improve their grasp of mythical motifs in later European and American literature. But the primary purpose will be to acquaint the student with the stories themselves.

211 The Greek Experience Fall. 3 credits. Not offered 1985–86. M.W.F. 11:15. F. Fahl. An introduction to the literature and thought of ancient Greece with an emphasis on their oral and dramatic presentation and intellectual and visual contexts. There will be an analysis of tragedy and comedy, satire, and epic and lyric poetry, as well as selected prose works, augmented by films, slides, play readings, and individual student interpretations.

212 The Roman Experience Spring. 3 credits. Not offered 1985–86. M.W.F. 11:15. Staff. An introduction to the civilization of the Romans as expressed in their literature, art, and social and political institutions. This course will examine not only the intellectual life of the Romans but what it meant for men and women of all social classes to live in the Roman world. Selected readings in translation of works of literature, history, and philosophy (supplemented by slides and other visual materials).

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 upperclass students may be accepted. Apply in writing to the Chairman, Department of Classics, 120 Goldwin Smith Hall. Limited to 12 students per section. M.T.W.F. 11:15. Staff. The teachers of Initiation to Greek/Roman Culture will devote the whole semester exclusively to this course. 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 procedures; and participate in workshops with specially invited guests.

This year, Initiation to Greek Culture will read Euripides' plays. This involves critical analysis of the plays, following the long path from Aristotle's Poetics, to Nietzsche's enthusiastic reading of Greek tragedy, to Dodds' disturbing appreciation of Euripides "the irrationalist." The course will also survey modern productions of Euripides in theater and film, compare the plays with the other Greek sources and with the artistic representations on vase painting, and visit museums where these vases are preserved.

218 Initiation to Roman Culture Spring. 4 credits. M.T.W.F. 11:15. Staff. See the description of 217 above. In the spring, the Initiation to Roman Culture will take as its theme "The Nostalgic Empire" and survey the literature, art, and documents of the Augustan period in Rome: the era of Virgil, Horace, Propertius, Livy, the "Altar of Peace," a massive building program; and a great religious revival. The emphasis will be on the view of Rome's past presented in these texts and artifacts, so that students will explore the early history of Rome and her years as a republic through the lens of Roman culture under the first emperor, Augustus Caesar. Like the fall seminar, the course will include films, workshops reconstructing Roman daily life, and field trips to various museums.

222 The Individual and Society in Classical Athens Spring. 3 credits. Prerequisite: Classics 211 or 222. History 161 or 266 or permission of instructor. Not offered 1985–86. From Classical Athens (fifth and fourth centuries B.C.) comes many of the most outstanding achievements in Western civilization: in literature, art, philosophy, historical writing, and science. 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 to be covered 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 1985–86. An introduction to the pre-Socratic philosophers and Plato.

225 Hellenistic and Roman Philosophy Spring. 3 credits. Not offered 1985–86. An introduction to Hellenistic and later Greek and Roman philosophy, including Stoicism and Epicureanism.

236 Greek Mythology (also Comparative Literature 236) Fall. 3 credits. T R 8:40–9:55. G. Waithart. A survey of the Greek myths, with emphasis on the myths that have entered the postclassical 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. Not offered 1985–86. M.W.F. 11:15. K. Clintow. The development and character of Mystery cults from the original Mysteria of Demeter and Persephone to the Christian Mysteries. The cults include the Kabirat, 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 1985–86. M.W.F. 10:00. K. Clinton. 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 Fall. 3 credits. Not offered 1985–86. Staff. Study of writing in antiquity through selected readings (in translation) from the Greek and Roman historians. Among the topics to be examined are the historian's task as understood by the ancients; the method and attitude of Dionysius, and accuracy of the Greek and Roman historians, and their attitudes to the events that they relate.

300 Greek and Roman Drama: Greek Tragedy (also Comparative Literature 300) Spring. 4 credits. M.W.F. 2–3.0. 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 1985–86.

336 Foundations of Western Thought (also Comparative Literature 336) Fall. 4 credits. Not offered 1985–86. M.W.F. 2–3.0. P. Milas. 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, Heracitus, Aeschylus, Sophocles, Thucydides, Plato, Aristotle, Epicurus, the Stoics, St. Paul, and Augustine.

337 Ancient Philosophy of Science Spring. 4 credits. H. Hours to be arranged. M. Cook. The development of the 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 Wit: An Introduction to the Theory and Form of Comic and Satiric Writing in Greece and Rome (also Comparative Literature 339) Fall. 4 credits. T R 10:10–11:25. F. Ahl.
The aim is not only to provide an introduction to the
care of laughter itself in light of both ancient and modern scholarship on the subject, from Plato's Philebus to Freud's Wit and Its Relations to the Unconscious and Koestler's The Act of Creation.

Examination of select works and passages of Homer, Euripides, Aristophanes, Herodotus, Lucian, Plautus, Nonnus, Horace, Martial, Juvenal, and Petronius.

[340 Ancient Greek Constitutions Spring
3 or 4 credits. Prerequisite: one of the following: survey of Greek history, a course in Greek civilization, ability to read Greek, or permission of instructor. Not offered 1985–86. T 12:20–2:15, R 12:20–1:10, L. Abel. 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 Mycenaean kingdoms 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 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.]

363 Women in Classical Greece and Rome (also Women's Studies 363) Spring. 3 or 4 credits (4 credits with extra weekly session (R 12:20–1:30) reading Greek text). T 12:20–2:30 L. S. Abel. 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 general historical 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.


[681 Patristic Seminar: Graduate Fall or spring. 4 credits. Not offered 1985–86.]

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 spring. 4 credits. Fall: M W T F 12:20, A. Nussbaum. Spring: M W F 11:15, P. Mitsis. An introduction to Attic Greek. Designed to enable the student to read the ancient authors as soon as possible.

103 Attic Greek Fall or spring. 4 credits. Prerequisite: Classics 101 or equivalent. M W T F 12:20. Fall: D. Mankin; spring: K. Clinton. A continuation of Classics 101.

111–112 Modern Greek 111, fall; 112, spring. 3 credits each term. M W F 9:05. G. M. Messing.

201 Attic Authors Fall. 3 credits. Prerequisite: Classics 103 or equivalent. M W F 1:25. C. Newlands. Euripides' Medea and selected readings from Thucydides and Plato.

203 Homer Spring. 3 credits. Prerequisite: Classics 103 or equivalent. M W F 9:05. D. Mankin. Readings in the Homeric epic.

[204 Plato Spring. 3 credits. Prerequisite: Classics 103 or equivalent. Not offered 1985–86. M W F 1:25. Staff. Selected readings from Plato.]

209 Greek Composition Fall. 3 credits. Prerequisite: Classics 103 or equivalent. TR 10:10–11:25. K. Clinton.

210 Greek Composition Spring. 3 credits. Prerequisite: Classics 209 or equivalent. TR 10:10–11:25. Staff.

[301 Greek Historians Fall. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. Not offered 1985–86. M 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. Not offered 1985–86. Staff.]

[303 Readings in Greek Rhetoric Fall. 4 credits. Not offered 1985–86. M 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. M W F 2:30. P. Mitsis.

306 Greek Melic, Elegiac, and Bucolic Poetry Spring. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. Hours to be arranged. A. Ford. A survey of selected "lyric" poems from the Archaic to the Hellenistic ages. Special attention to the historical and literary context of the poetry.

[307 Plato Fall. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. Not offered 1985–86. M W F 2:30. P. Mitsis. Plato on egoism, love, and friendship: Lysis and Symposium.]

[308 New Testament Greek Spring. 4 credits. Not offered 1985–86. M W F 9:05. P. Mitsis. The career and writings of St. Paul. The course will focus on Paul's contribution to such central theological concerns of Western Christianity as the transcendence of God, christology, grace and free will, etc. In addition, we will examine Paul's role in the growth and development of early Christianity; his relation to Greek thought, Hellenistic Judaism, and Hellenistic Christianity; the literary form of the epistle; etc. Readings in Greek augmented by representative examples of recent New Testament criticism.]

[310 Greek Undergraduate Seminar Fall or spring. 4 credits. Prerequisite: two terms of 200-level Greek or permission of instructor. Not offered 1985–86.]

[340 Ancient Greek Constitutions Spring. 3 or 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. Not offered 1985–86. T 12:20–2:15, 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. K. Clinton. A reading of several Greek tragedies.

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. TR 10:10–11:25. Staff.

[419 Advanced Greek Composition Fall. 3 credits. Prerequisite: Classics 209–210 or equivalent. Not offered 1985–86.]

[442 Greek Philosophy Fall or spring. 4 credits: Not offered 1985–86.]


672 Seminar in Greek (The Philosophy of Socrates): Graduate Spring. 4 credits. Hours to be arranged. G. Vlasis.

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 spring. 4 credits. Fall: M T W F 8, M. Ierulli; M T W F 2:30, H. Walker; M W T F 1:25, F. Ahl. Spring: M T W F 8, 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 or spring. 4 credits. Prerequisite: Classics 105 or placement by departmental examination. Fall: M T W F 10:10, C. Newlands. Spring: M T W F 8 or 10:10, staff; or 1:25, F. Ahl. A continuation of Classics 105, using readings from various authors.

108 Latin in Review Fall. 3 credits. Prerequisite: placement by departmental examination. M W F 11:15. A. Nussbaum.

205 Intermediate Latin Fall. 3 credits. Prerequisite: Classics 106 or 108 or placement by departmental examination.

M W F 10:10, N. Krewans; M W F 1:25, P. Mitsis. The poetry of Ovid. Selections from the writings of one of Rome's most influential and controversial poets. Topics covered in class will include Ovid's treatment of Greek myth, his narrative technique, and his supposed "immorality."

[207 Catullus Spring. 3 credits. Prerequisite: Classics 106 or 108 or one term of 200-level Latin. Not offered 1985–86. M W F 2:30. Staff. Readings from Catullus's poetry, with emphasis on the traditions of love poetry, the poet's relation to his society, and other literary topics.]

Classics 123
124 Arts and Sciences

208 Roman Drama  Spring. 3 credits. Prerequisite: Classics 106 or 108 or one term of 200-level Latin. Hours to be arranged. C. Newlands.


[241 Latin Composition  Fall. 3 credits. Prerequisite: Classics 106 or 108 or equivalent. Not offered 1985–86. W F 2:30. F. Ahl.]

[242 Latin Composition  Spring. 3 credits. Prerequisite: Classics 241 or equivalent. Not offered 1985–86. Staff.]

[312 Latin Undergraduate Seminar  Fall or spring. 4 credits. Prerequisite: two terms of 200-level Latin or permission of instructor. Not offered 1985–86.]

[314 The Augustan Age  Fall. 4 credits. Prerequisite: two terms of 200-level Latin or permission of instructor. Not offered 1985–86.]

[315 Roman Satire  Spring. 4 credits. Prerequisite: two terms of 200-level Latin. Not offered 1985–86.]

[316 Roman Philosophical Writers  Fall. 4 credits. Prerequisite: two terms of 200-level Latin. Not offered 1985–86.]

317 Roman Historiography  Fall. 4 credits. Prerequisite: one term of 300-level Latin or permission of instructor. M W F 1:10. J. Ginsburg.

Reading of three "conspiracy narratives": from the works of Sallust, Livy and Tacitus. Class discussion will focus both on historical questions (such as the causes of discontent that gave rise to these episodes in Roman history) and why the Romans defined these events as conspiracies) and on the narrative techniques used by Roman historians to impose an interpretation on their material.

318 Roman Elegy: Tibullus, Propertius, Ovid  Spring. 4 credits. Prerequisite: two terms of 200-level Latin. M W F 11:15. Staff.

[366 Late Latin  Spring. 4 credits. Prerequisite: permission of instructor. Not offered 1985–86.]

368 Medieval Latin Literature  Fall. 4 credits. Prerequisite: Classics 214 or permission of instructor. M W F 2:30. W. Wetherbee.

Medieval Latin texts and their historical and cultural contexts are closely studied.

411 Advanced Readings in Latin Literature  Fall. 4 credits. For advanced undergraduates and graduate students. Prerequisite: two terms of 300-level Latin or permission of instructor. Hours to be arranged. N. Krevans.

441 Advanced Latin Composition  Fall. 3 credits. For undergraduate students who have completed Latin 241–242 and for graduate students. Hours to be arranged. Staff.

451-452 Independent Study in Latin, Undergraduate Level  451, fall: 450, spring. Up to 4 credits. Hours to be arranged. Staff.

[460 The Latin Poems of Milton  Fall. 4 credits. Prerequisite: two semesters of 300-level Latin. Not offered 1985–86.]

679 Seminar in Latin (Sallust): Graduate  Fall. 4 credits. T 1:25–4:25. J. Ginsburg.


751–752 Independent Study for Graduate Students in Latin  751, fall: 752, spring. Up to 4 credits. Hours to be arranged. Staff.

Classical Archaeology

220 Introduction to Classical Archaeology (also History of Art 220)  Spring. 3 credits. M W F 10:10. J. Coleman and teaching assistant. The archaeology of the ancient Greeks and Romans as seen from a critical perspective. Major developments in Classical archaeology will be traced from treasure hunting to modern scientific research. Examples illustrating various approaches will be chosen: 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.

221 Minoan-Mycenaean Art and Archaeology (also History of Art 221)  Fall. 3 credits. M W F 10:10. J. Coleman.

The birth of civilization in Greece and the Aegean islands during the Bronze Age. The main focus is on the rise and fall of Minoan Crete and Mycenaean Greece, with consideration given to the nature and significance of Aegean interactions with Egypt, the Near East, and Anatolia. Topics also include Cyprus as an intermediary between the Aegean and the eastern Mediterranean, the effects of the volcanic eruptions of Santorini-Thera, and the evidence of Homer and the Greek myths.

[232–233 Archaeology in Action I and II  MWF 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  Fall or spring. 4 credits. Limited to 10 students. Prerequisite: permission of instructor. M 12:20; 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 reading 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. M W F 1:15. J. Coleman.

Recent developments in the archaeology of Athens from the Geometric period to late antiquity. Topics will include consideration of the nature of Athenian society and an assessment of the influence of Athens on the rest of the Greek world and beyond.

[321 Archaeology of Cyprus (also History of Art 321)  Spring. 4 credits. Prerequisite: Classics 220 or permission of instructor. Not offered 1985–86.]

322 Greeks and Their Eastern Neighbors (also History of Art 328)  Spring. 4 credits. Prerequisite: Classics 220 or 221, or permission of instructor. Not offered 1985–86. J. E. Coleman.

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.


Vase painting, wall painting, and mosaics from the ancient Mediterranean world will be studied in conjunction with the testimony of Greek and Roman sources. An attempt will be made to grasp the concerns and achievements of the Classical painters.


A stylistic and iconographical approach to an art in which the Greeks excelled. The course will be arranged chronologically, from the early (eleventh century B.C.) anonymous beginnings to the "personal" hands of identifiable masters of the fifth and fourth centuries B.C. Styles other than Attic will be stressed.

326 Art and Archaeology of Archaic Greece (also History of Art 326)  Fall. 4 credits. Not offered 1985–86. A study of the formative period of Classical Greek civilization, primarily on the evidence of art and archaeology. Attention is concentrated on the beginnings and early developments of architecture, sculpture, and painting.

327 Greek and Roman Coins (also History of Art 327)  Spring. 4 credits. Not offered 1985–86. The varied issues of Greek cities and the Roman state are examined. Coins are considered as art objects as well as economic and historical documents. The changes in design, value, and metals from the origins of coinage to the Late Roman period are studied. Lectures, student presentations, and work with actual examples.

328 Greek Architecture (also History of Art 328)  Fall. 4 credits. Prerequisite: Classics 220 or permission of instructor. Not offered 1985–86.

329 Greek Sculpture (also History of Art 329)  Fall. 4 credits. Not offered 1985–86. Study of ancient Greek sculptural techniques and achievements in marble and bronze. Detailed examination of a selection of works to illustrate sculptural development.

330 Art in Pompeii: Origins and Echoes (also History of Art 330)  Spring. 4 credits. Not offered 1985–86. Greek and Roman art in the context of the daily life of a provincial Italo-Greek town. The interrelation of art and household objects in classical culture will be stressed, and earlier traditions will be described. Subsequent development of Roman minor arts will be covered, as well as the discovery of Pompeii and its effect on European taste.

350 Arts of the Roman Empire (also History of Art 332)  Fall. 4 credits. Not offered 1985–86. M W F 11:15. A. Ramage.

The visual arts in the service of the first world state. The course starts with the Etruscan and Republican period but concentrates on monuments of the imperial era in Italy and the provinces until the time of Constantine.
classes per week, one of which will be devoted to Alambra, in Cyprus, will be available for study. Three which will involve work with practical data. Material from activation and other scientific analyses of pottery, surface survey, particularly in the Aegean and Cyprus; Mediterranean. Students will present two papers, one of the Cornell collections and from the excavations at Alambra, in Cyprus, will be available for study. Three courses, per week, one of which will be devoted to practical work and student papers.

[629 Seminar in Classical Archaeology: Graduate Fall. 4 credits. Not offered 1985–86. W 1:25–4:25 J. Coleman. The archaeology of Crete, the Cyclades, and the Bronze Age. Courses will cover the history and meaning of Early Cycladic sculpture, the historical and artistic significance of Thera in the Middle and Late Bronze Age, and the interactions between the islands Cretan, and the mainland; and the importance of metals to the economy of the Cyclades.]

630 Seminar in Classical Greek Archaeology: Graduate Fall. 4 credits. M 1:25–4:25 J. Coleman. Greece in the fourth century BC. Topics will focus on city and country life, the Panhellenic sanctuaries (including the recent excavations at Nemea), and the tombs and monuments of individuals, such as the so-called tomb of Philip II of Macedon.

Comparative Linguistics

420 History of the Greek Language Fall. 3 credits. TR 8:40–9:55 G. M. Messing. Lectures and assigned readings will cover the evolution of Greek from Linear B and its subsequent development up to the Koine.


[423 Vulgar Latin Fall. 4 credits. See also Romance Linguistics. Not offered 1985–86. Hours to be arranged. G. M. Messing. Selected texts such as the Peregrinatio ad loca sancta will be used to chart the changes in Latin that contributed to the development of the Romance languages.]

[424 Italic Dialects Fall or spring. 4 credits. Not offered 1985–86.]


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 Modern Languages and Linguistics Philosophy Society for the Humanities Women's Studies

Comparative Literature


The Department of Comparative Literature provides a broad range of courses in European and, to some extent, non-European literatures. Courses variously stress central authors, themes, problems, styles, genres, historical periods, and theoretical perspectives. The department offers opportunities for advanced coursework in literary study—e.g., example, 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 see the director of undergraduate studies. Upon 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 pursuit of personal interests. The specific contours of such a program are worked out in consultation between student and advisor.

Requirements for the Major

The student must complete:
1) five courses in comparative literature at the 200 level and above. A student may include up to two literature courses from other departments.
2) five literature or civilization courses at the 200 level and above in at least one foreign literature department. Texts must be read in the original language. A student may offer one language course (conversation, composition, etc.).
3) a two-semester senior essay (Comparative Literature 493–494, Senior Essay) of roughly fifty pages, normally 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 analysis of authors in literature (e.g. Comparative Literature 295, Introduction to Semiotics, or Comparative Literature 381, Marxist Cultural Theory).
2) additional course work in language, literature, and related disciplines in the humanities and social sciences.
3) 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 quality of the student's senior essay, course work for the major, and overall academic performance at Cornell.

For further information, students should contact the Department office, 244 Goldwin Smith Hall (telephone: 256-4155).

Freshman Seminars

Any 100-level course may be used toward satisfying the Freshman Seminar requirement. 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 201, fall; 202, spring. 4 credits. Comparative Literature 201 and 202 may be taken independently of each other. M W 10:10, sec. F 10:10, 11:15, or 12:20. Fall: W. Cohen; spring: W. J. Kennedy.

A reading each semester of seminal texts that represent and have often shaped Western culture and ought to be part of every college student's education. By analyzing, interpreting, and evaluating them, students will develop essential critical reading abilities. 201: selections from the Bible, Homer, Aristophanes, Dante, Rabelais, Shakespeare, and others. 202: selections from Voltaire, Goethe, Nietzsche, Ibsen, Pirandello, Joyce, and others.


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. While this course will survey many of the usual basic linguistic divisions—phonology, morphology, syntax, language change, etc.—it is not in rivalry with Linguistics 101 and will omit as nonpertinent some material vital to potential linguistics majors. On the other hand, we will explore in some depth the implications of all the selected topics for literary studies.
236 Greek Mythology (also Classics 236) Fall. 3 credits. MWF 9:05. G. Warhaft. A survey of the Greek myths, with emphasis on the myths that have entered the postclassical Western tradition. Of the aspects of myth study of which we will be concerned, 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 and thought. Comparison and contrast to Roman myths will also be included.

300 Greek and Roman Drama: Greek Tragedy (also Classics 300) Spring. 4 credits. MWF 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.

302 Literature and Theory (also English 302) Fall. 4 credits. MWF 11:15. (two lecs and one disc). J. Guller. This introduction to contemporary literary theory will investigate 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 implications of the aspects of myth study of which we are to be concerned. The material we will explore will be divided into three major periods: Weimar film, 1918–33; Nazi film, 1933–45; 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.


328 Literature of the Old Testament Fall. 4 credits. Not open to freshmen. MWF 10:10–11:25. F. A. Hart. The aim is not only to provide an introduction to the comedy, satire, and other humorous writings 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 in light of both ancient and modern scholarship on the subject, from Plato's Philebus to Freud's Wit and Its Relations to the Unconscious and C. G. Jung's The Act of Creation. Examination of select works and passages of Homer, Euripides, Aristophanes, Herocles, Lucian, Plautus, Nonnus, Horace, Martial, Juvenal, and Petronius.

343 Medieval Literature Fall. 4 credits. MWF 12:20. R. E. Kaske. Analysis and interpretation of great medieval literary works in translation. Though readings will be somewhat from year to year, a typical program would be Boeowulf; the Nibelungenlied; Niallsaga; a romance of Chrétien; Wolframs's Parzival; Gottfried's Tristan; or Sir Gawain and the Green Knight.

352 Classic and Renaissance Drama (also Theatre Arts 325) Not offered 1985–86. A. Caput.
427 Seminar on Biblical Law Fall. 4 credits. Limited to 20 students.


430 Readings in the New Testament in Modern Literary Spring. 4 credits. 600-level credit can be granted to graduate students after consultation with the instructor.
W 1:25–3:20 W. W. Hochheim. Seminar for graduates and advanced undergraduates on the novel of education and development from Goethe, Balzac, and Stendhal via Flaubert and Henry Adams to Gide and Thomas Mann (Magic Mountain, Felix Krull). Discussion will relate the problems of development in the form of the novel. Related subjects (such as the Künstlerroman and the novel of cultural diagnosis) will be taken up.

446 The Work of Carlos Fuentes (also Spanish 494) Spring. 4 credits.
M 2:30–4:25. Collectively taught by C. Arroyo, J. Kronik, M. Randel, E. Santi, J. Tittler, and K. Vernon. This course, for both undergraduates and graduates, is designed to coincide with the visit to Cornell of Carlos Fuentes. It will survey his work, including his novels, theater, and criticism, from a variety of perspectives. Conducted in English. Readings in English or Spanish.

493–494 Senior Essay 493, fall; 494, spring.
4 credits. Hours to be arranged. Staff.

497 Heidegger: Short Writings (also German 497 and Romance Studies 497) Fall. 3 credits. Open to upper-division undergraduates and graduate students.
R. 2:30–4:25. C. Arroyo. A study of Heidegger’s essays on language, poetry, science, and technology. Readings include ‘The Origin of the Work of Art,’ ‘What Are Poets For,’ ‘The Age of the World Picture,’ ‘The Question Concerning Technology,’ and ‘Letter on Humanism,’ by other writers on human existence. Aesthetic and literary ideas will be tested through the analysis of literary texts. The course will explore the possibilities and meaning of interdisciplinary knowledge on the basis of a “step back” (Schritt zurück) to topics that are predisciplinary.

499 Borges (also Spanish 499) Fall. 4 credits.
M W F 12:20 E. Santi. A detailed reading of Borges’s stories, essays, and poems, with particular attention to his standing in world literature, his affinities with other modern literary figures ( Kafka, Nabokov), and his favorite themes: the tensions between literature and philosophy, theory of fiction, and modernity. Readings and discussion in English. Knowledge of Spanish helpful but by no means essential.

603 History of Literary Theory Fall. 4 credits.

619–620 Independent Study 619, fall; 620, spring.
Variable credit. Comparative Literature 619 and 620 may be taken independently of each other.

640 Nietzsche and His French Reception Spring. 4 credits.
M 3:35–5:30 J. Monroe. In recent years the relationship between philosophy and literature has been a subject of increasing interest among a number of contemporary French writers trained in philosophy and literary theory. The aim of this course is to examine the question of “philosophico” (a novel of educational and developmental philosophico” and “poetic”) in Nietzsche’s prose in light of related texts by F. Schlegel and the Jena group of German romanticism and the work of such contemporary French thinkers as Deleuze, Derrida, Lacoue-Labarthe, and Nancy.

652 Renaissance Drama Spring. 4 credits.
T. 10:10–12 J. Culler. The study of the dramatic play, from the origins to the end of the sixteenth century. The course will focus on the question of the relationship between popular culture and the classical revival, with emphasis on the subversive, even proto-revolutionary functions of the plays and their theaters. Analysis of the ideology of dramatic form, with some attention to institutional contexts. Works by Shakespeare, Marlowe, Jonson, Lope de Vega, Calderón, Corneille, and Molière. Additional reading from Bakhtin and recent ideological critics of Renaissance drama. Readings will be from sixteenth- and seventeenth-century social and political writers.

670 Bakhtin and the Russian Formalists (also Russian Literature 670) Spring. 4 credits. All readings in English.
W 3:30–5:30 C. G. Emerson.

671 Bertolt Brecht in Context (also German Literature 679 and Theater Arts 679) Spring. 4 credits. Requirements: seminar paper that will form the basis for an oral presentation for class discussion.
M 2:30–4:30 D. B. Batthrick. Brecht’s theory and dramatic praxis will be examined in the light of a twofold context: (1) in the relation of selected plays and writings to the historical contingencies of the Weimar and exile periods in which they emerged; and (2) in later periods: an analysis of the reception and various readings of these same works by later critics and 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.

680 Problems in the Lyric Spring. 4 credits.
T 10:10–12 J. Culler. Investigation of the theory of the lyric and of contemporary approaches to lyric poetry, with special reference to Baudelaire, as well as to poems from the English and French traditions by such authors as Shakespeare, Blake, Mallarmé, Valéry, Frost, and Auden. Questions to be covered include the status of genre, its relation to literary history, conceptions of intertextuality, problems of voice and figure, and approaches to poetic representations of women. Critical readings will include works by Adorno, Benjamin, Brooks, De Man, Friedrich, Jakobson, Jauss, and Rifaterre. Reading knowledge of French required.

689 Art and Truth: The Aesthetic Theory of Theodor W. Adorno (also German Literature 689) Spring. 4 credits.

690 Marxism and Contemporary Theory Fall. 4 credits.
M 3:35–5:30 W. Cohen. Marxism currently faces powerful challenges to its traditional preeminence as the chief theory of modernity. We will consider recent work by Marxists, poststructuralists, and feminists, with the aim of locating areas of convergence as well as of contradiction among these.
different models. In each section of the course the reading will move from social and cultural paradigms to literary theory and from there to practical criticism. Selections from such writers as Althusser, Foucault, Habermas, Jameson, Kristeva, Said, Spivak, and others.

691 Laughter (also French 691) Fall. 4 credits. M 2:30-4:25 D. I. Grossvogel. A comparative analysis of French and English humor in the fictional writings of such authors as Gide, Queneau, Proust, Huxley, Waugh, Amis, etc. Sociological and psychoanalytic assumptions will serve as the point of departure for the reading of these texts.

698 Gadamer’s Hermeneutics (also German 698) Fall. 4 credits. Open to qualified undergraduates after consultation with the instructor. W 1:25-3:20 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 relation to theoretical knowledge; “objectivity” and “subjectivity” in interpretation; the role of language in human existence; the nature of the aesthetic phenomenon. Various intellectual trends will be located and evaluated in terms of an overall theory of understanding.

Related Courses in Other Departments

Many of these courses are conducted in English, and readings are in translation.

Asian Studies

Japanese Theatre (Asian Studies 338)

German Literature

Anti-Semitism in Germany and the Jewish Response (German Literature 349 and Near Eastern Studies 349)

Freud and the Fin de Siècle (German Literature 683)

Society for the Humanities

Literary Criticism and the Critique of Imperialism (Society for the Humanities 430)

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 science and computation should take Computer Science 621 (instead of Computer Science 222) and Computer Science 622 (as a related elective) and concentrate in some 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; and
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 or Mathematics 191-192-293;
2) programming and systems: Computer Science 100, 211, 310, and 314;
3) theory of computation: Computer Science 280, 381, and 432 (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:

1) Electrical engineering courses numbered 230 or higher
2) Operations research courses numbered 260 or higher
3) 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 adviser. 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 electives requirement will be strictly followed. This requirement helps insures 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

Hons. 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.

100 Introduction to Computer Programming (also Engineering 100) Fall, spring, or summer. 4 credits. Students who plan to take both Computer Science 101 or 102 and 100 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 Fall, spring. 3 credits. Prerequisite: Computer Science 100 or equivalent programming experience.
2 lecs, 1 rec. 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.
4 credits. Prerequisite: Computer Science 310 or permission of instructor.

3 lecs. 2 evening exams.

314 Introduction to Computer Systems and Organization Fall 1985, and spring or summer thereafter. 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 310 and 381 or permission of instructor.

Not offered every year.

Spring. 4 credits. Prerequisites: Computer Science 481 and permission of instructor or permission of instructor.

[18] Machine Organization Spring. 4 credits. Prerequisite: Computer Science 314 or permission of instructor.

Not offered every year.

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. Not offered 1985–86.

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.

484 Introduction to Symbolic Computation Spring. 4 credits. Prerequisites: Computer Science 481 or Mathematics 332 or 432 or permission of instructor. Not offered every year.

2 lecs.

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.

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 Spring. 4 credits. Prerequisites: Computer Science 414 and 600 or permission of instruction.

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 1985–86.]

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 instruction.

3 lecs.

622 Numerical Optimization and Nonlinear Algebraic Equations Spring. 4 credits.

3 lecs.

623 Database Systems Fall. 4 credits. Prerequisites: Computer Science 310 and Computer Science 432 or permission of instructor.

2 lecs.

635 Information Organization and Retrieval Spring. 4 credits. Prerequisite: Computer Science 310 or equivalent or 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.

3 lecs.

662 Robotics Laboratory Fall. 1 credit. Prerequisite: graduate standing or permission of instructor.

1 lab.

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.

710 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.

711 Topics in Programming Languages and Systems Fall or spring. 4 credits. Prerequisites: Computer Science 613 or permission of instructor.

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.

714 Distributed Computing 4 credits. Prerequisites: Computer Science 414 and an advanced systems course (e.g., Computer Science 613, 614, 632, or 643).

2 lecs.

715 Seminar in ProgrammingRefinement Logics Fall or spring. 4 credits. Prerequisite: permission of instructor.

719 Seminar in Programming Fall or spring. 4 credits. Prerequisite: Computer Science 621 or 622 or permission of instructor. Not offered every year.

2 lecs.

722 Topics in Numerical Analysis 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.

[73] Selected Topics in Information Processing Not offered 1985–86.]

2 lecs.

[73] Seminar in File Processing Fall. Credit to be arranged. Prerequisite: Computer Science 733 or permission of instructor. Not offered 1985–86.]

739 Seminar in Information Organization and 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 613 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.

800 Special Investigations in Computer Science Fall or spring. Prerequisite: permission of a computer science adviser. S-U grades only.
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; 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 offered outside the College of Arts and Sciences, except that Economics 399 will not count toward the 20-credit requirement. With the permission of the major advisor, 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 advisor’s permission, a statistics course offered by another department may be substituted for Economics 319.

An honors program will be offered in the 1986–87 academic year. Students should consult the director of undergraduate studies for more information.

Students planning graduate work in economics or history or, with permission of the director, another department may be substituted for Economics 319.

Open to upperclass students with some background in economics or history, or with permission of instructor.

Courses

101 Introductory Microeconomics Fall, spring, or summer. 3 credits. Economics 101 is not a prerequisite for 102.
Lecs 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.
Lecs and disc.

Analysis of aggregate economic activity in relation 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 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 effects of natural monopoly and public utility pricing; (e) the failure of the market to achieve desired redistributional 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 in 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 technological society. Alternative political-economic solutions will be explored.

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 market, the structure 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 the role of oligopoly, monopsony, and imperfect competition in determining the structure of the market is examined. Topics covered include an overview 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 effects of natural monopoly and public utility pricing; (e) the failure of the market to achieve desired redistributional objectives; (f) direct and indirect taxation as instruments of redistribution.

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 or spring. 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.

Econometric 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. 4 credits. Prerequisites: Economics 101–102 and Math 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 models, multiple regression models, 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 problems in American economic history from the Civil War to World War I.

325 Economic History of Latin America 4 credits. Open to upperclass students in some background in economics or history, or with permission of instructor.

326 History of American Enterprise 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.
Introduction to the political, economic, and cultural situation of Hungary, Czechoslovakia, and Yugoslavia since World War II, with emphasis on contemporary developments.

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.
Interdisciplinary survey of the USSR since the Revolution, with emphasis on contemporary developments.

331 Money and Credit
Spring. 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. 4 credits.
Prerequisites: Economics 311–313 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 macroeconomics 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.
Prerequisites: 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 microeconomic 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 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.

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 market structure; information and advertising; pricing and entry; regulation; research and development and technological progress; integration; and antitrust policy. Typically, about half of these topics would be covered in any individual year. The course will blend empirical and institutional analysis, with a heavy emphasis on theoretical modeling.

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 goals 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. 4 credits.
Prerequisites: Economics 101–102.
The emphasis will be on the application of simple microeconomic theory to problems (economic growth, business cycles, inflation, dispersion.

361 International Trade Theory and Policy
Fall. 4 credits.
Prerequisites: Economics 101–102 or permission of instructor.
The principles that guided the formation of international trade and commercial policies 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. 4 credits.
Prerequisites: Economics 101–102 or permission of instructor.
The principles that guided the formation of international financial policies are surveyed. The evolution of the theory of balance of payments adjustment, international monetary 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 national 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. 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.
Prerequisite: Economics 101–102.
Selected topics on the contemporary economic situation in the Soviet 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.).

371 Economic Development
Fall. 4 credits.
Prerequisites: Economics 311, 313, and 330 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; the processes, institution, 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, mortality, and migration, 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 consistency of these outcomes with national plans, and the policies used to implement them. The Yugoslav experience and, depending on student interest, the discussion will cover other foreign experiences such as Algeria, the Basque region, Chile, West Germany, 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. Prerequisite: Economics 311 or 313, and 312 or 314 or permission of instructor.
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.

399 Readings in Economics Fall or spring.
Variable credit. Independent study.

416 Intertemporal Economics Fall. 4 credits.
Prerequisites: Economics 311 or 313, and calculus.
This course is intended for advanced economics majors who are especially interested in economic theory. Topics to be covered: (a) review of the one good Ramsey model of optimal savings and accumulation; conditions for intertemporal efficiency in production; comparative dynamics and sensitivity analysis; (b) some earlier models of capital accumulation; the role 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 or 313, and one term of calculus.
This course aims to analyze economic theory and its application to the upperclass undergraduate. Course content may vary from year to year. Issues that may be examined here include (1) how can economic activities 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 require only a modicum of analytic tooling up, and (2) to illustrate the deductive approach in actual learning: 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, and the Rational Expectations School. In fact the fact that almost all intermediate macroeconomic textbooks are Keynesian in perspective, clearly Keynesian economics is currently at bay. We shall review critically critiques to Keynesian theory.

481 Economics Effects of Participation and Labor-managed Systems Spring. 4 credits. Prerequisites: Economics 311 or 313, and 320, 381, and calculus.
The course applies microeconomic theory to analyze the performance of firms in which employees either participate in the decision-making process or make all the important decisions. The economics of democratic enterprises are examined with particular emphasis on their ability to model the relevant institutions and test the resulting theoretical predictions with appropriate economic 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 organization. The instructor will act primarily as a coordinator and resource person, together with occasional invited speakers. The practical component involves 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 and 482.
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 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 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.

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 recursive, 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 to 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: 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 Quantitative Methods Fall. 4 credits.
Prerequisites: good control of microeconomic and macroeconomic theory and some knowledge of linear algebra, and probability; or permission of instructor.
The application of quantitative analysis to testing of economic theories provides a framework for study and evaluation of cross-section and time-series data, methodology and theory of economic measurement, statistical techniques, empirical studies, and economic forecasting.

523 American Economic History Fall. 4 credits.
For description see Economics 323.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Terms Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>524</td>
<td>American Economic History</td>
<td>4 credits</td>
<td>Spring</td>
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<td>For description see Economics 324.</td>
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<tr>
<td>525</td>
<td>Economic History of Latin America</td>
<td>4 credits</td>
<td>Fall</td>
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<td>For description see Economics 325.</td>
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<tr>
<td>535</td>
<td>Public Finance: Resource Allocation and Fiscal Policy</td>
<td>4 credits</td>
<td>Fall</td>
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<td></td>
<td>For description see Economics 336.</td>
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<tr>
<td>536</td>
<td>Public Finance: Resource Allocation and Fiscal Policy</td>
<td>4 credits</td>
<td>Fall</td>
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<td></td>
<td>For description see Economics 336.</td>
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<tr>
<td>551</td>
<td>Industrial Organization</td>
<td>4 credits</td>
<td>Fall</td>
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<td>For description see Economics 351.</td>
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<tr>
<td>552</td>
<td>Public Regulation of Business</td>
<td>4 credits</td>
<td>Spring</td>
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<td></td>
<td>For description see Economics 352.</td>
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<tr>
<td>554</td>
<td>Economics of Regulation</td>
<td>4 credits</td>
<td>Fall</td>
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<td></td>
<td>For description see Economics 354.</td>
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<td>555</td>
<td>Politics and Markets</td>
<td>4 credits</td>
<td>Fall</td>
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<td></td>
<td>For description see Economics 355.</td>
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<tr>
<td>557</td>
<td>Economics of Imperfect Information</td>
<td>4 credits</td>
<td>Fall</td>
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<tr>
<td></td>
<td>Prerequisites: Economics 509 and statistics.</td>
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<td></td>
<td>The purpose of the course is to consider some major topics in the economics</td>
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<td>of uncertain information. Although the precise topics considered will vary</td>
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<td>from year to year, subjects such as markets with asymmetric information,</td>
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<td>signalling theory, sequential choice theory, and search theory will be</td>
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<td>discussed.</td>
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<tr>
<td>561</td>
<td>International Trade Theory and Policy</td>
<td>4 credits</td>
<td>Fall</td>
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<td></td>
<td>For description see Economics 361.</td>
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<tr>
<td>562</td>
<td>International Monetary Theory and Policy</td>
<td>4 credits</td>
<td>Spring</td>
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<td></td>
<td>For description see Economics 362.</td>
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<tr>
<td>565</td>
<td>Economic Problems of Latin America</td>
<td>4 credits</td>
<td>Spring</td>
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<td></td>
<td>For description see Economics 364.</td>
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<tr>
<td>567</td>
<td>Comparative Economic Systems: Soviet Union and Europe</td>
<td>4 credits</td>
<td>Fall</td>
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<td>For description see Economics 367.</td>
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<tr>
<td>571</td>
<td>Economic Development</td>
<td>4 credits</td>
<td>Spring</td>
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<td></td>
<td>For description see Economics 371.</td>
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<tr>
<td>572</td>
<td>Applied Economic Development</td>
<td>4 credits</td>
<td>Spring</td>
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<tr>
<td></td>
<td>For description see Economics 372.</td>
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<tr>
<td>573</td>
<td>International Specialization and Economic Development</td>
<td>4 credits</td>
<td>Spring</td>
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<tr>
<td></td>
<td>For description see Economics 373.</td>
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<tr>
<td>578</td>
<td>Economics, Population, and Development</td>
<td>4 credits</td>
<td>Fall</td>
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<td></td>
<td>For description see Economics 378.</td>
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<tr>
<td>581</td>
<td>Economics of Participation and Worker-Management</td>
<td>4 credits</td>
<td>Fall</td>
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<td>For description see Economics 381.</td>
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<tr>
<td>582</td>
<td>The Practice and Implementation of Self-Management</td>
<td>4 credits</td>
<td>Fall</td>
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<td>For description see Economics 382.</td>
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<tr>
<td>599</td>
<td>Readings in Economics</td>
<td>Variable credit</td>
<td>Fall or spring</td>
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<td></td>
<td>Independent study.</td>
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<tr>
<td>603</td>
<td>Seminar in Peace Science</td>
<td>4 credits</td>
<td>Fall</td>
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<td></td>
<td>Among topics to be covered at an advanced level are game theory, coalition</td>
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<td></td>
<td>theory, bargaining and negotiation processes, cooperative procedures,</td>
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<td>microbehavior models, macrosocial processes, and general systems analysis.</td>
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<td>605</td>
<td>Advanced Social Theory for Peace Scientists</td>
<td>4 credits</td>
<td>Spring</td>
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<td></td>
<td>Prerequisites: Economics 505 and knowledge of microeconomic theory.</td>
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<td>Study of diverse social science hypotheses and theories as they relate to,</td>
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<td>and can be synthesized within, multiregional, multinational, and generally</td>
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<td></td>
<td>multigroup conflict and cooperative frameworks. Particular attention will be</td>
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<td>given to developments stemming from microeconomics and general systems theory.</td>
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<td>Dynamic analyses will be emphasized.</td>
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<td>610</td>
<td>Stochastic Economics: Concepts and Techniques</td>
<td>4 credits</td>
<td>Spring</td>
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<td></td>
<td>Prerequisites: Economics 509, 510, 513, 514, 519, and 520. This course will</td>
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<td>review a number of techniques that have been useful in developing stochastic</td>
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<td>models of economic behavior. Among these are (a) discrete-time Markov</td>
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<td>processes, (b) dynamic programming under uncertainty, and (c) continuous-time</td>
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<td>diffusion processes. Examples of economic models will be drawn from recent</td>
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<td>literature on optimal capital accumulation and optimal savings and</td>
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<td>portfolio selection problems; permanent income hypothesis; dynamic models</td>
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<td>of price adjustment, etc. Advanced graduate students contemplating work in</td>
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<td>economic theory and econometric theory will be able to get some exposure to</td>
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<td>current research.</td>
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<tr>
<td>611</td>
<td>Advanced Microeconomic Theory</td>
<td>4 credits</td>
<td>Fall</td>
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<tr>
<td>612</td>
<td>Advanced Macroeconomic Theory</td>
<td>4 credits</td>
<td>Fall</td>
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<tr>
<td>617</td>
<td>Mathematical Economics</td>
<td>4 credits</td>
<td>Fall</td>
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<td>618</td>
<td>Mathematical Economics</td>
<td>4 credits</td>
<td>Spring</td>
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<tr>
<td>619</td>
<td>Econometrics</td>
<td>4 credits</td>
<td>Fall</td>
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<td></td>
<td>Prerequisites: calculus and linear algebra. Recommended: Economics 520 or</td>
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<td>equivalent. Detailed examination of regression models at the level of H.</td>
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<td>Theil, Principles of Econometrics. Emphasis is on theoretical aspects rather</td>
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<td>than practical applications. Topics include distribution theory and the use</td>
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<td>of sufficient statistics, the classical regression model, generalized least</td>
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<td>squares, modified generalized least squares, and the multivariate regression</td>
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<tr>
<td>620</td>
<td>Econometrics</td>
<td>4 credits</td>
<td>Spring</td>
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<tr>
<td></td>
<td>Prerequisites: calculus, linear algebra, and Economics 619, or permission</td>
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<td></td>
<td>of instructor. Recommended: Economics 520 or equivalent. Advanced topics in</td>
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<td>econometrics, such as asymptotic distribution theory, errors in variable and</td>
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<td>latent variable models (e.g., factor analysis), simultaneous equation models</td>
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<td>with particular attention to problems of identification, time series analysis,</td>
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<td>qualitative response models, and aggregation.</td>
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<tr>
<td>623</td>
<td>American Economic History</td>
<td>4 credits</td>
<td>Fall</td>
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<tr>
<td>624</td>
<td>American Economic History</td>
<td>4 credits</td>
<td>Spring</td>
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<tr>
<td>626</td>
<td>Methods in Economic History</td>
<td>4 credits</td>
<td>Spring</td>
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<tr>
<td>631</td>
<td>Monetary Theory and Policy</td>
<td>4 credits</td>
<td>Spring</td>
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<tr>
<td>632</td>
<td>Monetary Theory and Policy</td>
<td>4 credits</td>
<td>Spring</td>
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<tr>
<td>635</td>
<td>Public Finance: Resource Allocation and Fiscal Policy</td>
<td>4 credits</td>
<td>Fall</td>
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<tr>
<td>636</td>
<td>Public Finance: Resource Allocation and Fiscal Policy</td>
<td>4 credits</td>
<td>Spring</td>
</tr>
<tr>
<td>638</td>
<td>Public Finance: Local Government and Urban Structure</td>
<td>4 credits</td>
<td>Fall</td>
</tr>
</tbody>
</table>

If you have any specific questions or need further assistance, feel free to let me know!
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, and on relationships 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 develop programs of study for their profession, poetry, drama, or the novel. Others have a special interest in creative writing. Students may also concentrate in medieval studies or American studies.

Courses for Nonmajors

For students not majoring in English, the department makes available a variety of courses at all levels. Some courses are the usual freshman-level courses for English majors, and all of them are open to nonmajors. 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 topics 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 "Special Programs and Interdisciplinary Studies." courses for Sophomores

Although courses numbered in the 200s are primarily for sophomores, some of them are open to qualified freshmen and to upperclass students. Courses are approved to be taken by freshmen in the fall or spring, 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

Fall, 201; spring, 202. 4 credits each term. Open to all undergraduates. English 201 is not a prerequisite to 202. May be counted toward the English major. M W F 11:25, C. Levy; T R 12:20, G. Teskey; T R 2:30, D. Eddy. Spring. 3 credits. Each course will be conducted by a combination of lectures and intensive seminars in special topics.

Courses Primarily for Nonmajors

205-206 Readings in English and American Literature

Fall, 205; spring, 206. 3 credits each term. Open to all undergraduates. English 205 is not a prerequisite to 206. M W F 10:10, R. Farrell.

205: An introduction to some of the major texts from the beginning through the eighteenth century. The first two weeks will be devoted to Beowulf and two of Chaucer's Canterbury Tales, as samples of early yet readable
265 Afro-American Literature: Black Women and Their Fictions
Spring. 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 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 feminism? What about the histories of this class. Readings by Harriet E. Wilson, Frances Harper, Anna Julia Cooper, Nella Larsen, Zora Neale Hurston, Gwendolyn Brooks, Ann Petry, Paula Marshall, Toni Morrison, Toni Cade Bambara, Alice Walker, Gloria Naylor, and Jamaica Jincada.

267 Twentieth-Century Southern Fiction
Spring. 4 credits.
M W F 1:25. L. Herrin.

The course will deal exclusively with the fiction of the twentieth-century American South—arguably, in time and place, the richest concentration of writers we have—and will proceed more or less chronologically. After a brief background survey, the course will begin with William Faulkner, then move to Thomas Wolfe, James Agee, and Robert Penn Warren. The stories and short novels of Katherine Anne Porter, Flannery O’Connor, Carson McCullers, and Eudora Welty will make up one part of the course, as will the short work of three black writers, Richard Wright, Ernest Gaines, and Gayl Jones. The semester will end with novels by two contemporaries, William Styron and Walker Percy, and, if time permits, by one or two others. Short interpretative papers and class discussion.

273 Irish Culture
Fall. 4 credits.

An interdisciplinary survey of Irish culture from earliest times to the present. Major topics include literature, history, mythology, early Irish social life, 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 by Yeats, Synge, Joyce, O’Casey, and others 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 1861–63. The course will conclude with a consideration of post-Revolutionary literature and of the continuing Ulster crisis. No prerequisites.

274 Scottish Literature and Culture
Spring. 4 credits.
Both English majors and non-majors are welcome. Limited to 25 students.

Scotland was an independent kingdom during most of its history. Although it is now united with England, it preserves its distinctiveness. Scottish literature thus profits from being studied as something more than a mere appendage of the literature of England. This course provides an introduction to Scottish literature and its cultural context. We will focus on important Scottish literary texts, with special emphasis on the medieval period and the eighteenth and nineteenth centuries. In addition, we will provide something of an introduction to Scottish history and to nonliterary expressions of Scottish culture (such as music and painting). The course should appeal to those who want to know more about their Scottish ancestors, to those who wish to view in a new perspective works normally considered monuments of “English” literature, and to those who simply wish to know more about a remarkable culture and its people. Authors studied will include Hennyson, Dunbar, the anonymous Scottish Ballads, Hume, Burns, Scott, Hogg, Stevenson, and Gissane Gibbon.

277 Folklore and Literature
Fall. 4 credits.
T R 2:30–3:45. A. Lyke.

An introduction to traditional American and British folklore—folk speech, riddles, proverbs, ballads and songs, myths, legends, tales, superstitions, and customs—combined with the study of works of American and British literature that have made extensive use of folk sources. For example, we will read the classic ballads together with balladists by Burns, Keats, Yeats, and Merwin; fairy tales with Christina Rossetti’s Goblin Market; and animal tales and myths together with Faulkner’s The Bear. Students will also collect and analyze original folk materials.

287 Autobiography: Theory and Practice
Fall. 4 credits.

This undergraduate nonfiction prose writing seminar, students explicate canonical autobiographies as models of rhetoric to be imitated in weekly writing assignments. Students are required to keep a journal and participate in weekly workshops. Readings include autobiographies by Augustine, Rousseau, Douglass, Sartre, Nabokov, Hurston, etc.

290 Literature and Value
Spring. 4 credits.

Each week a different member of the faculty discusses a poem, a group of poems, a story, play, or novel that is of particular importance to him or her, perhaps as a work that contributed to the person’s decision to devote a lifetime to the study of literature or to the writing of fiction or verse, perhaps as a work that has affinity with present-day concerns. In following meetings that week, class members will discuss in detail the same or related works. Students will be encouraged to explore in their papers for the course as well as their discussions, the relationship between specific texts and their own experience, attitudes, and values.

Courses that Satisfy the Major Prerequisite

270 The Reading of Fiction
Fall or spring. 3 credits. Each section limited to 15 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.
Forms of modern fiction, with emphasis on the short story and novel. Critical study of works by English, American, and Continental writers from 1880 to the present—Bellow, Chekhov, Conrad, Faulkner, Joyce, Mann, Kafka, and others.

271 The Reading of Poetry
Fall or spring. 3 credits. Each section limited to 18 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 8:40, L. Green; T R 10:10, E. Fogel. Spring: to be announced.
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 15 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: T R 2:30, T. Murray; T R 10:10, S. McMullin. Spring: to be announced.
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 discussion and papers as well as a special project related to the plays 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 eight 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 Americanness in those relationships, and the assumptions about history and language with which critical appreciation must engage. Works by such Major Ranks as Franklin, Hawthorne, Twain, Stephen Crane, Wharton, James and Fitzgerald.

280-281 Creative Writing Fall, 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.
An introductory course in the theory and practice of writing narration 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.

Major Periods of English Literature
[313 Middle English Literature in Translation Fall. 4 credits. Not offered 1985–86.]
[318 Saga as Historical Novel: An Introduction to Saga Literature Fall. 4 credits. Not offered 1985–86.]
[320 The Sixteenth Century: Tudor Culture Spring. 4 credits. Offered alternate years. C. Levy.]

The main traditions in poetry—metaphysical, neoclassic, and the Spenserian inheritance—with emphasis on John Donne, Ben Jonson, Andrew Marvell, and on the genres they utilized: lyric, love elegy, formal satire, epistle, verse epistle, ode, hymn, death elegy, mock-epic. Also, consideration of the major work in prose of Bacon, Burton, Browne, Walton, and Bunyan and of the King James Version of the Bible; prose style; popular prose forms: essay, character, letter, biography.


A reading of poetry by Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats, together with some of their letters and critical writings as well as related prose works by De Quincey, Mary Shelley, and James Hogg. Using some contemporary critical and theoretical accounts of romantic writing, we will try to come up with fresh definitions of central romantic concerns: autobiography, revolution, representation, and the Sublime, for instance.

345 The Victorian Period Spring. 4 credits. M W F 11:15. P. Sawyer.
The poetry of Tennyson, Browning, and Arnold; two novels, Great Expectations and Middlemarch; one play, Major Barbara; and selections from Carlyle, Ruskin, Darwin, and others. The Victorian age was a period of turbulence and uncertainty much like our own.

The extremes of wealth and poverty created by the factory system, the challenges to religious belief, and the advances of science stimulated people to rethink basic questions—How should I live? What can I hope for?—and to seek answers in a flourishing literature. Concentrating on close reading, the course will consider the relationship of literature to the science, religion, and politics of the time and the development of new literary forms.

348 The Female Literary Tradition: Wollstonecraft to Woolf (also Women's Studies 348) Spring.
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 Victorians women writers confront their inner worlds, before turning to the emerging of the "new woman" and "utopian women's fiction at the end of the nineteenth and beginnings of the twentieth-century modernist experiment by women.

Texts will include works by Wollstonecraft, Austen, Mary Shelley, Emily and Charlotte Bronte, Eliot, Barrett Browning, Gaskell, Gilman, Schreiner, and Woolf.

350 The Early Twentieth Century (to 1914) Fall. 4 credits. M W F 10:10. D. Schwarz.
Critical study of major works by Hardy, Conrad, Lawrence, Joyce, 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 1914.

A survey of modern English, Anglo-Irish, and Anglo-Welsh fiction, poetry, and drama by Shaw, Lawrence, Joyce, Forster, 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.

Major English Authors
The course will center on a close reading of the major Canterbury Tales, the Troilus, 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.

[321 Spenser and Malory Fall. 4 credits. Not offered 1985–86.]
327 Shakespeare Fall. 4 credits. M W F 9:05. T. Murray.
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.

An introduction to the poetry of John Milton.

Major Periods of American Literature
The literature of ideas produced by America's Puritan and Enlightenment writers: Bradford, Taylor, Edwards, and Franklin. The first fruits of the national literature: Irving, Cooper, Poe, and Hawthorne.

A study of nineteenth century American thought and writing in the period from 1830 to about 1860, which produced the first so-called classic American authors. Emphasis will be on major works of Emerson, Hawthorne, Melville, Thoreau, Whitman, and Dickinson and on their relation to each other; to their time, especially its political and technological developments; and to our own time, which has labelled these masterpieces collectively as the "American Renaissance." The course will try to assess this label through discussion and some lectures on texts, contexts, and the curiosities of literary judgment.

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 Fall. 4 credits. Limited to 55 students. M W F 11:15. J. Bishop.
This course will alternate yearly with English 365, which surveys American literature since 1945. It will accordingly be concerned with a sequence of works that can illustrate different stages of American literature in the years between the First and the Second World Wars. Poetry may be represented by T. S. Eliot, Wallace Stevens, and W. C. Williams, prose fiction by Sinclair Lewis, Fitzgerald, Hemingway, Faulkner, Dos Passos, Richard Wright, and Mary McCarthy; nonfictional prose by Agee and Edmund Wilson. The texts will be chosen to exemplify the first responses of Americans to the pressure of modernity through this exceptionally creative period in our culture.

[365 American Literature since 1945 Spring. 4 credits. Limited to 55 students. Not offered 1985–86.]

Genres and Special Topics
302 Literature and Theory (also Comparative Literature 302) Fall. 4 credits. M W F 11:15 (2 lecs, 1 disc). J. Culler.
This introduction to 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 difficult theoretical texts by such authors as Barthes, Derrida, De Man, Foucault, Freud, and Lacan. Readings will also include discussions of criticism by Terry Eagleton, Stanley Fish, Mary Louise Pratt, and Barbara Johnson. There will be a midterm, a paper, and a final examination.

The rise of the novel in eighteenth-century England. Why did the novel become a dominant literary genre in
360 American Poetry, 1650–1950 Fall. 4 credits.
M W F 1:25. R. Morgan.
Readings in American Poetry from Bradstreet and Taylor through Robert Lowell. Part survey and part examination of poems, the lectures and discussions will address such questions as: what is American poetry and what does it mean? where has it gone in three hundred years? Major attention will be given to the poems and the theoretical prose of Emerson, Poe, Whitman, Dickinson, Frost, Stevens, and Eliot. It is permissible to make selections from contemporary poetry. Spring: to be arranged.

366 The Earlier American Novel: Nathaniel Hawthorne to Henry James Fall. 4 credits.
M W F 10:10 D. McColl.


368 The Contemporary American Novel Spring. 4 credits.
M W F 1:25. M. Hite.
This course examines a selection of major American novels written since 1945, including works by Barth, Ellison, Hawkes, Morrison, Pynchon, and Walker.

370 The Nineteenth-Century English Novel Fall. 4 credits.
A study of a variety of works by major English novelists from Austen to Eliot. The course will explore these works from different perspectives, focusing on the individual texts as well as on the question of what is involved in reading them (or any other novels). By the end of the course, the student should have learned something about the Victorian literary past.

372 English Drama (also Theatre Arts 372) Spring. 4 credits. Not offered 1985–86.
Creative and Expository Writing

382–383 Narrative Writing 382, fall; 383, spring. 4 credits each term. Each section limited to 15 students. Students are encouraged to take English 280–281 previously. Prerequisite: permission of instructor, normally on the basis of a manuscript. Fall: M W F 12:20, Hanson; M W F 2:30, W. Slatoff; plus conferences to be arranged. Spring: to be announced.
The course is an introduction to the study of models, analysis of students' work.

384–385 Verse Writing 384, fall; 385, spring. 4 credits each term. Each section limited to 15 students except Ammons's section, which is limited to 12 students. Prerequisites: English 280 and permission of instructor. Fall: M 2:30–4:25, K. McClane; W 2:30–4:25, P. Janowitz. Spring: T 2:30–4:25, A. Ammons; W 2:30–4:25, P. Janowitz. The writing of poetry; study of models; analysis of students' poems; personal conferences.

386 Autobiographical Writing Fall. 4 credits. Not offered 1985–86.

388–389 The Art of the Essay 388, fall; 389, spring. Limited to 15 students. Prerequisites: permission of instructor. Interested students should submit a writing sample to the appropriate professor before the beginning of the course. Fall: T R 12:20 (and conferences to be arranged). L. Fukundy. Spring: M W 2:30 (and conferences to be arranged). C. Levy.

392 Writing & Society: From Plato to the Present Fall. 4 credits.
M W F 12:20. T. Hill.
A course focusing on the study of different forms of writing and the social and historical context in which they have been written.

405 Between Hermeunetics and Deconstruction: The Politics of Contemporary Criticism Fall. 4 credits. Limited to 15 students. Open only to undergraduates. Prerequisite: permission of instructor. Background in literary studies will be expected, but no training in critical theory will be presumed. T R 2:30–3:45. S. P. Mohanty.

406 Evolution of Epic Fall. 4 credits.
The course is concerned with the poetic and thematic transformation of the English epic or long narrative poems. Readings for the seminar will include Spenser, The Faerie Queene; Milton, Paradise Lost; Dryden, The Hind and the Panther; Wordsworth, The Prelude; Whitman, Song of Myself; Byron, Don Juan; Tennyson, Idylls of the King; and William Carlos Williams, Paterson. A final epic poem may be chosen by the student. Enrollment in courses at the 400 level is limited by prerequisite or permission of the instructor.

409 Freud as Imaginative Writer and Reader (also Comparative Literature 409) Spring. 4 credits.
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 of works such as Oedipus and E. T. A. Hoffmann's stories. We will question how and why Freud's writing focuses on sexuality and on fantasy as the basic conditions of mental life. Readings for the 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 your own dreams may be one of several short papers for the course. No exam; one final paper.

427 Studies in Shakespeare Fall and spring. 4 credits each term.
Fall: T R 2:30. E. Fogel.
A study of three or four plays. The emphasis will be on class discussion, based upon a careful reading of the Shakespearean texts. Throughout, our effort will be to discover the special qualities of each play by examining Shakespeare's language, his psychological and political insights, and his relationship to the thought and culture of his time and ours. Plays studied will be Hamlet, Twelfth Night, Othello, and The Tempest; we shall also dip into the sonnets when they deal with sentiments and issues relevant to those represented in the plays. There will be three short papers and no examinations.

Spring: Courtesy, Romance, and Shakespearean History
A study of themes and patterns in Shakespeare's later history plays, Richard II, 1 & 2 Henry IV, and Henry V, in the perspective afforded particularly by Castigliano's Book of the Courtier, Elyot's The Governor, A Mirror
450 The History of the Book

For Magistrates; and Sidney's The Countess of Pembroke's Arcadia. Among topics to be explored are growth, responsibility, play, order, and community.

429 Milton and Romantic Poetry

4 credits. Not offered 1985–86.

431 Satire: Motives and Structures

Spring. 4 credits.

T R 10:10 F. Bogel.

Satire is a literary form, but it is closely related to a variety of nonliterary activities: blaming, cursing, ridiculing, stirring up passion, definition by comparison, stigmatization, scapegoating, and others. This course will combine close analysis of satiric works with readings from several fields (literary criticism and theory, French culture, history, and philosophy) to understand satire as a literary, psychological, and cultural phenomenon. Literary texts will be drawn principally from the eighteenth century—especially works of Swift, Pope, Fielding, and Gay—though we will also study earlier and more recent satires, including caricatures and satiric cartoons from the contemporary press. The course will be conducted as a discussion.

441 Wordsworth and Keats

Fall. 4 credits.


What are the concerns and choices common to Keats and Wordsworth, who embody contrasting notions of the English romantic poet? Wordsworth has been called a poet of recollection; Keats a poet of prospective, rather than retrospective, vision, of anticipation rather than remembrance. What are the underlying conflicts and resonances in these poets' relations to time and past experience? We will explore these questions through a close reading of selected works, including parts of Lyrical Ballads and The Prelude and Keats's odes and the Hyperion poems, paying particular attention to the rhetorical figures and the theories of language at work in these poems.

447 The Last Victorians

Fall. 4 credits. Not offered 1985–86.

M W F 1:25. S. Parrish.

Responses to the breakthrough of "Victorian" values in the late 1880s and 1890s in the fiction, plays, poetry, and critical writings of Hopkins, Housman, and Hardy, Pater, Wilde, and Beerbohm, Shaw, William Morris, and G. W. F. Watts. We will try to understand how these responses have helped to shape the values that define the "modern world."

450 The History of the Book

Spring. 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 texts and typography and printing, bookbinding, and the history of ideas, historical contexts, and methods of literary criticism. Readings will include Lawrance, Women in Love, Joyce, Ulysses, Rilke, Pound, Hugh Selwyn, Auden, the Cantos; Eliot, The Waste Land, For Quartets; Woolf, Mrs. Dalloway, to the Lighthouse; Hemingway, The Sun Also Rises; and Yeats, The Tower, Last Poems.

453 The Political Novel in America

Fall. 4 credits. Limited to 15 students.

T R 12:20 C. Strout.

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, Chomsky, Steinbeck, Steinbeck, Hart, Hirsch, Ellison, Cozzens, and Vidal (among others) will be studied. Previous work in American literature, history, or government recommended.

454 American History and LiteraryImagination

Spring. 4 credits.


A study of the interplay between the historical and the literary imagination in short story, drama, and novel about controversial American issues such as the Salem witchcraft trial, the Nat Turner slave revolt, Huey Long's career, the Oppenheimer security hearing, and the Rosenberg spy case. Texts include documentary sources, critical theory, and historical commentary as well as primary literary works by such writers as Hawthorne, Melville, Arthur Miller, Heinir Kippphardt, William alron, Robert Penn Warren, and E. L. Doctorow.

465 Stevens and Eliot

Fall. 4 credits.

T 12:20 L. Green.

Close readings of most of the major poetry of these two writers. We will try to articulate the larger differences as well as subtle similarities between the two giants of American modernism. The course is primarily intended for third- and fourth-year students and will require four short papers and oral reports.

467 James, Fitzgerald, Hemingway, and Faulkner

Spring. 4 credits.

T R 10:10 D. McCall.

Questions of identity in the great tradition of the American novel.

468 Studies in Afro-American Literature

Fall. 4 credits. Limited to 20 students. Non—English majors are encouraged to enroll, provided they seek permission from the instructor.

T R 2:30 K. McCline.

Much of Afro-American literature—as is any literature of oppressed communities—is concerned with survial motions, and one of the most important of these motions is one's use and sense of history. In Afro-American literature, the past is often used as a helpmeet: one can, if one understands one's history, use one's history as a shield and as a weapon. In Ellison, for example, the young narrator of Invisible Man, grandson how his generation survived, in the hope that his grandson will profit from this wisdom. But it is up to the grandson to listen; and it is in this complex interchange between generations that important traditions are renewed or lost. The seminar will focus on the importance of legacy and the crucial nature of "witness" as an Afro-American aesthetic—be it the blues, allusions to folktales (Brer Rabbit and High John de' Lion), or a grandfather's admonition. A partial list of readings includes Ellison's Invisible Man, Hurston's Their Eyes Were Watching God, Baraka's Dutchman, Baldwin's Just above My Head, Walker's The Third Life of Grange Copeland, Wideman's Sent For You Yesterday, and Hughes's The Best of Simple.

471 Problems in the Novel

Spring. 4 credits.

T R 2:30 M. Seltzer.

An interdisciplinary examination of the subject of power in the novel. Readings will include American, French, and English novels of the later nineteenth century. Narrative theory, and social history.

476 Women's Poetry (also Women's Studies 476)

Spring. 4 credits.

T R 10:10 D. Mermin.

A history of the female poetic tradition in Britain and America, including such writers as Bradstreet, Dickinson, Browning, Renoncourt, Bishop, Brooks, and Plath.

477 Children's Literature

Fall. 4 credits. Not offered 1985–86.

T R 2:30–3:45. A. Lurie.

A survey of classic English and American works for children from 1850 to the present. Special topic for 1984: Folklore and fiction. Among the readings are Jacobs, English Fairy Tales; MacDonald, The Princess and the Goblin; Nesbit, The Lost Prince; Chestert, Little Women; Twain, Tom Sawyer; Stevenson, Treasure Island; Kipling, The Jungle Books; Baum, The Wizard of Oz; Barrie, Peter Pan; Nesbit, The Five Children and It or The Amulet; Grahame, The Wind in the Willows; Mine, Winnie-the-Pooh; Tolkien, The Hobbit; White, Charlotte's Web; L'Engle, A Wrinkle in Time.}

480–481 Seminar in Writing

480, fall; 481, spring. 4 credits. Limited to 15 students. Students are encouraged to take English 280–281 and either 382–383 or 384–385 previously. Prerequisite: permission of instructor; normally, on the basis of a manuscript.


Intended for those writers who have already gained a basic mastery of technique. Students normally enroll for both terms and should be capable of a major project—a collection of stories or poems, a group of personal essays, or perhaps a novel—to be completed by the end of the second semester. Seminars are used for discussions of the students' manuscripts and published works that individual members have found of exceptional value.

482 Poetics for Poets and Critics

Spring. 4 credits.

Limited to 15 students.

T 7–9:30 p.m. D. Stalinhow.

Designed for poets who prepared to take "Yeats's advice, "learn your trade," master your trade, and for critics wishing to study the ways in which the principal verse forms of English poetry have been adopted and adapted through the centuries. Each week's assignment will be an example of the form under discussion, from blank verse and ballad, sonnet, and villanelle, to "shaped" and "concrete" poems.

[488 Writing about Literature

Spring. 4 credits. Not offered 1985–86.]

491 Honors Seminar I: The Writing of Prophecy

Fall. 4 credits. Limited to 8 students. Prerequisite permission of the director of the honors program.

T 10:10 R. Parker.
Readings in the traditions of prophetic and visionary literature from the Old Testament onwards, with special attention to the poetics and politics of prophecy: questions of inspiration and originality; canonization and power; authority and "voice"; and political and social alienation. Readings will include texts from the Old and New Testament (e.g., those associated with the prophets Amos, Hosea, Ezekiel, Isaiah, Jeremiah, and John of Patmos) and texts arguably in the traditions of prophecy and vision by English and American writers such as Spenser, Milton, Bunyan, Smart, Blake, Coleridge, Shelley, Whitman, Crane, and Eliot. Critical readings will, in part, explore concerns shared by older traditions of biblical interpretation and more recent literary theory.

492 Honors Seminar II: Reading Joyce’s Ulysses
Spring. 4 credits. Limited to 15 students. Prerequisite: permission of the director of the honors program. T.R. 12:20. D. Schwarz.
A thorough episode-by-episode study of the art and meaning of Joyce’s Ulysses. We shall explore the relationship between Ulysses and other experiments in modernism and show how Ulysses redefines the concepts of epic and hero. We shall also see Ulysses to address major issues in literary study and to test various critical and scholarly approaches. Such a self-conscious inquiry into theories and methods should prepare students to confront other complex texts, as well as help them define their own critical positions as they plan their senior honors theses.

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. After consulting their major advisor, students should apply to the director of undergraduate studies for permission to take independent study. 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.

496 Teaching and Research Fall or spring. 1-2 credits. May not be used in satisfaction of requirements for the English major. Staff. For students who, with the consent of a professor, assist in the teaching of that professor’s course.

Courses Primarily for Graduate Students
Permsission 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 departmental brochure before course enrollment each term.

619 Chaucer Spring. 4 credits. R. Kaske.
620 Piers Plowman Spring. 4 credits. R. Kaske.
621 Renaissance Epic Fall. 4 credits. G. Teskey.
625 Jonson Spring. 4 credits. D. Novarr.
626 Seventeenth-Century Poetry Fall. 4 credits. M. A. Radzimowicz.
627 Shakespeare Spring. 4 credits. T. Murray.
633 Studies in the Eighteenth Century Fall. 4 credits. F. Bogel.
643 Romantics and Revolution Spring. 4 credits. R. Parker.
646 Victorian Prose Spring. 4 credits. P. Sawyer.
648 Dickens and His Circle Fall. 4 credits. E. Rosenberg.
651 Yeats and His Circle Fall. 4 credits. J. Stallworthy.
653 Emergence of Modernism Fall. 4 credits. S. Siegel.
665 Stevens, Moore, Crane Spring. 4 credits. S. Siegel.
667 Studies in American Fiction Fall. 4 credits. W. Staloff.
668 Postmodernist Novel Spring. 4 credits. M. Hite.
669 Afro-American Literature Fall. 4 credits. H. Gates.
670 Theory of the Novel Fall. 4 credits. D. Schwarz.
673 American Critical Theory Spring. 4 credits. C. Stratford.
674 Feminist Literary Theory Spring. 4 credits. M. Jacobson.
690 Psychoanalysis and Literature Fall. 4 credits. C. Chase.

Graduate Seminars
Permission of the instructor is a prerequisite for admission to any course numbered in the 700s. Most of these courses may be limited in enrollment at the discretion of the instructor. For course descriptions see the department brochure.

727 Shakespeare Fall. 5 credits. S. McMillan.
743 The Prelude Fall. 5 credits. M. Jacobson.
780.1 M.F.A. Seminar: Prose Fall. 5 credits. L. Herrin.
780.2 M.F.A. Seminar: Poetry Fall. 5 credits. R. Morgan.
781.1 M.F.A. Seminar: Prose Spring. 5 credits. L. Herrin.
781.2 M.F.A. Seminar: Poetry Spring. 5 credits. K. McClane.
793 Master's Essay Fall or spring. No credit. Staff.
794 Directed Study Fall or spring. 5 credits. Staff.
795 Group Study Fall or spring. 5 credits. Staff.
796 Teaching and Research Fall or spring. 5 credits. Staff.

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)

History of Literary Theory (Comparative Literature 403-404)

Setting in Modern Fiction (Comparative Literature 444)

The Semantics of Place in Literature and Art (Comparative Literature 445)

Problems in the Lyric (Comparative Literature 680)

Society for the Humanities

Literary Criticism and the Critique of Imperialism (Society for the Humanities 430)

French

See Modern Languages, Literatures, and Linguistics

Freshman Seminar Program

See pp. 225-231.

Geological Sciences


As an intercollegiate 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...
students 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 fifty 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, Argentina, Barbados, the South Pacific, 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.

Core Courses

326 Structural Geology
355 Mineralogy
356 Petrology and Geochemistry
375 Sedimentology and Stratigraphy
388 Geophysics and Geotectonics

Prospective majors should consult one of the following departmental major advisers: W. A. Bassett, W. B. Travers, J. Oliver, A. L. Bloom, or A. K. Gibbs, as early as possible for advice in planning a program.

Students majoring in geological sciences may attend the departmental seminars and take advantage of study abroad programs. There are sixteen faculty members, including Cornell's president, in the department, and fifty undergraduate majors. 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

German Literature

P. U. Hokensdahl, chairperson; H. Deinert, director of undergraduate studies; D. Bathnick, B. Buettner, I. Ezergailis, S. L. Gilman, A. Groos, J. C. Harris, C. A. Martin, L. M. Otschner

The Department of German Literature offers courses in German, medieval German, Yiddish, and Old Icelandic literatures. These courses reflect the heterogeneous composition of the department. They 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 History, History of Art, Theatre Arts, History, Government, and Comparative Literature and with the Medieval Studies and Women's Studies programs.
Washington program, in which students take courses in the area of European studies, and undertake a closely supervised internship during a subsequent term. Students also have an opportunity to apply to the Cornell-in-Brussels International Relations Concentration.

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 members concentrate on particular fields, and all are open to 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 for course descriptions and instructors. Admission is by application only.

111 The Government of the United States
Spring. 3 credits.
T. J. Lowi.
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. 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.

161 Introduction to Political Theory
Spring. 3 credits.
W. J. Dannhauser.
A survey of the development of Western political theory 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. 3 credits.
R. Rosecrance.
An introduction to the basic concepts and practice of international politics.

Freshman Seminars

100 Freshman Seminars
Fall or spring. 3 credits.
Seminar leaders are chosen by the department. They meet weekly with 12-16 students and guide them through a series of readings and discussions. Seminar topics vary widely, from introduction to a new field to in-depth exploration of a single topic.

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 internship during a fall or spring semester. For further information see pp. 40 and 100.

European studies concentration. Government majors may elect to group some of their required and elective 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, et cetera.

International relations concentration. See the description under "Special Programs and Interdisciplinary Studies."

Honors. Each year a small number of well-qualified students are selected to enter the honors program. Applications are due in April from sophomores and juniors who would like to enter the program the following year. Those selected begin by taking the honors seminar, Government 400. In their senior year, honors students define, research, and write a thesis of some sixty to eighty pages in length, working individually with a member of the faculty. The descriptions of Government 494 and 495 explain how this process is divided into two tutorials and what is expected of the student at different stages. Students are not allowed to take Government 499 their senior year from the same member of the faculty who supervises their work in 494 and 495. The decision to award honors and in what degree is made by a faculty committee chosen for that purpose, based on the student's record in government courses, the student's overall record at Cornell, and the quality of the thesis. For more information about the honors program and for application forms, students should come to 125 McGraw Hall.

Introductory Courses

Students registering for introductory courses should register for the lecture only. Sections will be assigned during the first week of class.

310 Power and Poverty in America
Spring. 4 credits.
H. King.
The United States is a stratified society conscious for great disparities in the allocation of income and wealth. Given democratic political institutions, one might have expected substantial popular efforts at redistribution. After reviewing the surprisingly small net fiscal effect of the federal government, we shall turn to specific welfare programs, surveying their particular forms and results. The principal goal for the term is to examine poverty policies insofar as they shed light on the conventional social science question: Who rules America? Attention will be given to competing interpretations of the parties, cultural power, the mass of political power, the modes of organization and participation of the poor, and to conditions necessary for significant readjustments in policy focus.

311 Urban Politics
Fall. 4 credits.
M. Schefter.
The interaction between urban problems and the politics of city government has resulted in important public policy issues in the United States. This course provides an introduction to the politics of metropolitan areas; analysis of the central institutions and processes of urban government, such as mayors, city councils, elections, and the criminal justice system; and specific public policy problem areas such as race relations, education, housing, law enforcement, and civil disorder.

312 Urban Affairs Laboratory
Fall. 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
Spring. 4 credits.
K. Clermont.
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 are 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. Students are expected to read assigned materials before each class and be prepared to participate in class discussions.


318 The American Congress Spring. 4 credits.

M. Shell

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.


327 Civil Liberties in the United States Spring. 4 credits.

B. Detwiler

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.

B. Detwiler

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.


401–402 America and the World Community (also Agriculture and Life Sciences 401–402) 401, fall; 402, spring. 3 credits each term.

Staff

The theme of world community is examined in terms of the directions the concept suggests, with special reference to the role of the United States in translating the concept into reality. The course seeks to examine the American experience against the background of world community from the points of view of the humanities, the social sciences, the natural sciences, and religious studies.


412 Size of the State Spring. 4 credits.

R. King

The size and scope of government has become a particularly important political issue in recent years. We tend, however, to suffer from considerable ignorance regarding the patterns and biases of policy in America. This course is intended as a research workshop to trace the expansion of the federal government and its programs and to develop relevant explanations.

423 Labor and the New Deal Spring. 4 credits.

M. Goldfield

The New Deal is a classic example of the development of a new governing coalition in the United States. Its emergence coincided with the organization and growing political strength of large segments of U.S. workers. Some have argued that the New Deal (e.g., Roosevelt) administration facilitated this organization as well as relied on it politically. Others have argued that labor got very little from Roosevelt, ultimately weakening itself in the long run by tying itself to his coattails. The course will focus on a variety of historical, legal, and quantitative data in an effort to answer this question.

424 Political Change in the United States Fall. 4 credits. Prerequisite: permission of instructor.

M. Shevlin

This seminar analyzes the sources and consequences of major realignments in American politics.


428–429 Government and Public Policy: An Introduction to Analysis and Criticism 428, fall; 429, spring. 4 credits each term. Open to undergraduates with permission of the instructor. 428 is a prerequisite for 429.

T. J. Lowi

The analysis and criticism of public policies and the governments and politics responsible for them is stressed in Government 428. 429 is a weekly workshop for a smaller group, concentrating on problems for research, writing, and publication.

Comparative Government

Government 131 is recommended.

[283] Contemporary European Society and Politics (also History 283) Not offered 1985–86.

285 Contemporary European Society and Politics (also German Literature 285 and History 285) Fall. 4 credits.

J. Pontusson, S. Gilman, R. Heis

This course provides a general introduction to modern European society and politics. Focusing on Britain and the countries of northern Europe, we will explore the meaning of current events and issues from a historical perspective. Topics for fall 1985 will include the legacy of colonialism; class culture and the role of organized labor; immigrant workers and ethnic minorities; problems of national identity; new social movements (e.g., the “Greens” in West Germany), and European perceptions of the United States. The course will pursue these themes and others through films, newspaper articles, and literature as well as critical writings. The course is designed for students with an interest in, or experience of, various European countries; who wish to increase their knowledge of Western Europe. There are no formal prerequisites.

326 Eastern Europe Today: Economics, Government, Culture (also Russian Literature 329 and Economics 329) Spring. 4 credits.

M. Rush, G. Gibian, G. Staller

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 USSR, domestic situations, and the economies and cultures.)

330 Soviet Union: Politics, Economics, and Culture Spring. 4 credits.

M. Rush, G. Gibian, G. Staller

Introductionary survey of the USSR since the Revolution, with emphasis on contemporary developments.


333 Government and Politics of the Soviet Union Fall. 4 credits.

M. Rush

A focus on 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, as well as on the variant forms that have appeared in other states.

334 Business and Labor in Politics Fall. 4 credits.

T. J. Pempel

Historically, business and labor have been critical elements in shaping the specific politics of most advanced industrial democracies. Land grants to United States railroad magnates, nationization and class consciousness in colonial Europe, the development of social welfare programs, and colonization and imperialism are but a few of the foremost examples. Today such interactions are similarly crucial in such diverse areas as the rise of multinational corporations, immigrant labor, strikes by public-sector employees, racial and class exclusionism in unions, environmental pollution, consumer protection, and electoral financing. The historical and contemporary roles of business and labor in such areas are examined in different industrialized societies.


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.

340 Latin American Politics Fall. 4 credits.

E. Kenworthy

An introduction to the politics and society of some Latin American nations, chosen for their significance politically or theoretically. Cultural heritage, economic strategies, and international relations form part of a discussion of why politics takes the forms it does in this region.

341 Society and Politics in Central Europe Spring. 4 credits.

P. Katzenstein

This course focuses on West Germany, East Germany, Austria, and Switzerland. It argues that since 1945 Central European politics has been transformed so drastically that it no longer fits traditional concepts. Today Central Europe stands as the exemplar of a new form of political economy that takes different national forms. The Central European countries project power both at home and abroad primarily in economic and social rather than military form. Nationalism, militarism, and authoritarianism have thus gradually been deprived of their traditional political foundations.

4 credits. Not offered 1985—86.


347 Chinese Government and Politics Fall. 4 credits. V. Shue. 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 communities, radical idealism and mass mobilization, bureaucratic politics, and the recent turn toward "market socialism."


349 Political Role of the Military Fall. 4 credits. B. Anderson. Comparative study of selected modern states and types of political systems in which the military have played a major role in domestic politics. Attention is given to the social and ideological character of the politicized military and various forms of military government.

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 Spring. 4 credits. M. Katzenstein. This course explores the social, economic, and political forces that have shaped India's development since independence. It considers why democratic political institutions in India have proved so resilient and what effect these institutions have on the economic and social policies that are pursued. The importance of international as well as domestic forces in shaping India's economic and political choices is also assessed.

352 The Modern History of Iran: Between Traditionalism and Change (also Near Eastern Studies 398) Spring. 4 credits. M. 7:30—9:30 p.m. D. Menashi. For description see Near Eastern Studies 398.

354 America in the World Economy Spring. 4 credits. P. Katzenstein. Unemployed auto workers in Detroit and the woodstoves in New England signal an important change in America's relation to the world economy. This course will examine the changing role of these factors and how they influence the global economic system. The focus will be on the role of the United States in the international economy and the implications of this role for the domestic economy.


357 Political Development in Western Europe 4 credits. Not offered 1985—86.

358 Politics of the Middle East (also Near Eastern Studies 294) Fall. 4 credits. D. Menashi.

An examination of the Middle East conflict, including domestic and foreign determinants of 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.


[367] Classics in Political Thought Fall. 4 credits. Not offered 1985—86.


368 Political Economy of the Welfare State Spring. 4 credits. E. W. Kelley. 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 useful to the course. The course will also discuss the role of gender in the development of welfare states, and the repeated occurrence of such problems as "stagflation."

373 Feminist Political Thought 4 credits. Not offered 1985—86.

375 American Political Thought 4 credits. Not offered 1985—86.

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. Lectures and discussion on the applicability to the current crisis in the world economy and the varieties of political response (Eurocommunism, socialism, feminism, ecology movements, antinuclear movement, the New Right, corporatism, neoconservatism, nationalism, and national liberation movements).

379 Freud Spring. 4 credits. S. Buck-Morss. Analysis of Freud's own writings on psychological and social theory, clinical practice, and analytic method. Consideration of the political implications of these texts and their philosophical contribution. Critical discussion of post-Freudian revisions of the theory, including Freud's revision, ego psychology, and radical feminism.

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 ethically 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 Aristotle, Hobbes, Hegel, and Marx.

466 The Repressed Feminine in the Writings of Marx 4 credits. Not offered 1985—86.

467 Current Topics in Political Philosophy (also Women's Studies 467) 4 credits. Not offered 1985—86.

468 The Theory and Politics of Liberal Feminism (also Women's Studies 468) 4 credits. Not offered 1985—86.

International Relations

Government 181 is recommended.
will also investigate transnational decision making at The relations of the United States with the major states 144 Arts and Sciences

387 The United States and Asia Spring. 4 credits. G. McF. Kahn. The United States and Asia: 1870-1919 (also History 379) with which it has been particularly concerned are analyzed. Attention is also given to the relationship of Asia to the policies of France, Great Britain, and Soviet Russia.

388 War and Society: The Origins of the First World War, 1870-1919 (also History 379) Fall. 4 credits. R. Rosecrance. The First World War destroyed the European world: its hegemony in international politics, its internal balance, its social and economic structures, its intellectual certainty. This course examines the long-term and 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 why the war was so long and destructive, and why, afterwards, no one could put the pieces back together again. If war occurs again in the contemporary world, it will almost certainly be a war whose causes are similar to those of 1914.

389 International Law Fall. 4 credits. L. Scheinman. Characteristics of international law: its theoretical foundations, principles, processes, and relationship to international politics. Emphasis on law-in-action. Attention to both traditional problems (intervention, coercion, and the scope and limits of adjudication) and contemporary trends and processes (arms control, outer space, exploitation of seabed resources, the individual in international law, and cooperative patterns of socioeconomic relations at global and regional level). Content may vary according to international events.

390 The Foreign Policy of China 4 credits. Not offered 1985–86.


479 Dependencia and the State 4 credits. Not offered 1985–86.


481 Foreign Policy of the USSR 4 credits. Not offered 1985–86.

482 Imperialism and Dependency Fall. 4 credits. E. Kerfoot. A critical reading of several conceptions of imperialism is followed by an analysis of the phenomenon in selected cases.

483 Political and Economic Interdependence 4 credits. Not offered 1985–86.


486 International Security: Soviet Security Policy Spring. 4 credits. C. Nation. This course provides an in-depth investigation of the security policy of the Soviet Union, covering the period 1917 to the present with particular emphasis upon the contemporary international situation. A broad definition of the attributes of security policy will be employed and the implications of Soviet policy choices explored in both the military, political, and economic realms.

487 Covert Intervention as an Instrument of American Foreign Policy 4 credits. Not offered 1985–86.

488 Comparative Capitalism Spring. 4 credits. P. Katzenstein. This course focuses on the political capacities to cope with industrial change. It analyzes the political structures and strategies distinctive of American liberalism, Japanese statist, and West German corporatism. The course also discusses the complex relations between different national approaches and the international system.

489 International Law and Regime Development Spring. 4 credits. L. Scheinman. The course examines and analyzes the development, maintenance, and transformation of technological, economic, and security regimes, giving particular emphasis to the role of international law processes and institutions. Monetary, oceanic, and arms control regimes, among others, will be covered in the course.


Political Methodology


Honors Courses

Each April a limited number of sophomore and 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 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 in 499 a government major may take while at Cornell, but he or she may count no more than 4 credits toward fulfillment of the major. Students who wish to continue taking Government 499 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. The permission of the instructor is required.

499 Readings Fall or spring. 1–4 credits. Staff.

Graduate 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 Spring. 4 credits. B. Ginsberg, M. Shetter. 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 Spring. 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
A review, analysis, and evaluation of the major theoretical literature on the genesis, expression, and management of political conflict resulting from ethnic, religious, racial, and linguistic pluralism. Of particular concern are the factors associated with ethnic political mobilization and the regulation of ethnic conflict in divided societies. The emergence of religious fundamentalism as a political force will also be analyzed.


647 Political Anthropology: Indonesia (also Anthropology 628) 4 credits. Not offered 1985–86.


651 Readings from Mao Zedong 4 credits. Not offered 1985–86.

652 Political Problems of Southeast Asia 4 credits. Not offered 1985–86.


659 Politics in Postwar Western Europe 4 credits. Not offered 1985–86.


Political Theory

665 American Political Thought 4 credits. Not offered 1985–86.

666 The Political Philosophy of Nietzsche 4 credits. Not offered 1985–86.


669 Modern Social Theory I Fall. 4 credits. S. Buck-Morss.

Modern Social Theory I Fall. 4 credits. S. Buck-Morss.

Readings vary, but topics are drawn from the traditions of Marx, Weber, Durkheim, 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, structuralism, poststructuralism, and feminism.


678 Greek Political Philosophy 4 credits. Not offered 1985–86.

International Relations

684 Politics of the Arms Race Fall. 4 credits. R. N. Labow.

An investigation of the political and psychological processes that drive the arms race. Students will investigate a particular aspect of this problem in the context of Soviet or American strategy or their mutual interaction. Emphasis will be placed on testing existing models of the arms race and developing new insights applicable to this problem.


687 International Relations of Asia Spring. 4 credits. G. McT Kahin.

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.

692 The Administration of Agricultural and Rural Development Spring. 4 credits. M. J. Esman.

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, and 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 in Third World countries.

Greek

See Department of Classics.

Hebrew

See Department of Near Eastern Studies.

Hindi-Urdu

See Modern Languages, Literatures, and Linguistics.

History


See Department of Classics.

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 (History
Honors. History majors with an overall B + average in all their history courses are eligible to enroll in History 400, 402. (Proposal form 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 seminar, students may become candidates for the degree of Bachelor of Arts with honors in history by submitting to a prospective faculty advisor a written thesis proposal delineating the general area of inquiry for an honors essay, and having the proposal approved by the advisor. 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 advisor, honors candidates should normally enroll with their advisors in History 400, Honors Research, during the first term of their senior year. History 401 is a four-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 advisor a ten-to-fifteen-page overview of the entire thesis or a draft of some substantial section of the thesis. This writing will be evaluated on the broad field of history that the student researched. The examination will be administered by a committee consisting of the student's advisor 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, a four-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 during 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 senior year. 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 text of the honors essay may not exceed sixty pages, except by permission of the chairperson of the honors committee and the student's advisor. 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 advisor and one or both 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–fourth year of their sophomore year or early in their junior year.

**Freshman Seminars**

**[104 Communes and Utopias: Alternative Life-Styles in American History Not offered 1985–86. G. C. Altschuler. This course examines the history of alternative groups in American society, with emphasis on alternative lifestyles.]**

**[106 Democracy and Education: History of Learning in America Not offered 1985–86. G. C. Altschuler. A survey of the history of educational thought and practice from Puritan times to the present, with an 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 1985–86. 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. T 2:30–3:45 R. Popenk. 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 and "brainwashing"; censorship and obscenity; John Milton, John Stuart Mill, and the critique of libertarianism.]**

**[112 The North Atlantic Community and the Wider World ]**

Spring. 3 credits. Prerequisite: permission of instructor. T 2:30–3:45. R. Popenk. 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 and "brainwashing"; censorship and obscenity; John Milton, John Stuart Mill, and the critique of libertarianism.

**[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 1985–86. 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 1985–86. 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, diplomatic effort, 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 gender-related conflicts within the United States forces, perceptions of the Vietnamese, and problems of readjustment to civilian life.)**

**[192 Japan and the West](Fall. 3 credits. Prerequisite: permission of instructor. Limited to 12 students. Not offered 1985–86. J. V. Koschmann.)**

**[193 China and the West before Imperialism](3 credits. Open to freshmen and sophomores. Prerequisite: permission of instructor. Not offered 1985–86. 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. Not offered 1985–86. 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 1985–86. T 2:30–4:25 W. LaFeber.)**

**[219 Freshman Seminar: History of North American Indians](Spring. 3 credits. Limited to 18 students. T R 10:10–11:25 D. H. Utter. 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.)**

**[246 America in the Camera's Eye](Spring. 3 credits. Open to freshmen and sophomores. Prerequisite: permission of instructor. T 2:30–3:45. R. L. Moore.)**
The seminar will attempt to assess the value of visual material (especially photography) in understanding twentieth-century American history. Students will read and view the work of some leading American photographers in an effort to understand how the camera has both reflected and helped create America's perception of itself. Frequent papers aim at helping students develop a vocabulary to articulate their reactions to visual material.

**Underclass Seminars**

203 The American Dream Fall. 4 credits. Prerequisite: permission of instructor. M 2:30-3:20 and W 2:30-4:30. F. Somkin. The dreams that have given distinctive shape to American life; and the collective dream of national mission to the individual dream of personal success.


206 Anarchism in America and Europe Spring. 4 credits. Prerequisite: permission of instructor. Not offered 1985–86. T R 2:20–1:35. 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; and anarchism and education.

209 Political History of Indians in the United States Not offered 1985–86. D. H. Unger. 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 resistance.

214 Freshman Seminar: 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 1985–86. T 2:30–4:25. W. L. Keifer.


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 development of 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 development of 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. British political, constitutional, economic, and imperial history are studied in the light of Victorian prose, poetry, and drama. History and literature are both considered: history through lectures and discussions of constitutional documents; literature through comment upon readings. Authors assigned include Macaulay, Carlyle, Tennyson, Mill, Darwin, Huxley, Gilbert and Sullivan, and Shaw.

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, Sherill, 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. 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.


**Comparative History**

274 Foodways: A Social History of Food and Eating 4 credits. Not offered 1985–86. W 2:30–4:30. 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 Pharaoh’s Egypt to the 1980s.

360 Early Warfare, East and West Spring. 4 credits. M W F 1:25. C. A. Peterson. A study of the principal modes of warfare found both in the East and the West from ancient times up to the eighteenth century. Tactical evolution and the impact of innovations are stressed, but attention is also paid to the general social background and the role of nonmilitary factors.

407 Death in Past Time 4 credits. Not offered 1985–86. S. L. Kaplan. Every culture has felt an urgent need to deal with death: to dignify, rationalize, and integrate it by giving it meaning. How culture perceives and propitiates death reveals a great deal about a society’s political and social 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.

**History of Science**


282 Science in Western Civilization Fall. 4 credits. History 281 is not a prerequisite to 282. T R 10:10–12:05. L. P. Williams. The development of scientific thought from antiquity to the present. Readings and discussions of original sources.

287–288 History of Biology (also Biological Sciences 201–202) 287, fall; 288, spring. 3 credits each term. Prerequisite: one year of introductory biology. 287 is not prerequisite to 288. 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 1985–86. M W 1:25; disc to be arranged. J. H. Weiss. Studies in the interaction between technological changes and social changes in Western Europe and America since the eighteenth century. Readings, lectures will deal both with instances of social transformation that accompanied technological changes and with the role of technology in social thought and cultural expression. Course gives special attention to three periods: Britain during the Industrial Revolution, America in the nineteenth century, and America during the Vietnam War.

447–448 Seminar in the History of Biology: Evolutionary Biology in Cultural Perspective (448 is also Biology and Society 402) 447, fall; 448, spring. 4 credits. Common Learning course. T 2:30–4:30. W. Provine. This course examines the persistent controversies in evolutionary biology in relation to historical and cultural settings. Among the controversies are continuity vs. discontinuity in the evolutionary process, and adaptive vs. nonadaptive change and units of selection. The relations of evolutionary biology to Marxism, religion, and ethics are among the issues to be explored.


**American History**

101–102 Introduction to American History 101, fall; 102, spring. 3 credits each term. M W F 10:10. G. C. Altschuler. A survey of United States history designed to introduce students to major themes and interpretations. History 101 traces the origins 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.

275 Crime and Punishment: From the Puritans to Mickey Spillane Spring. 4 credits. M W F 2:30–3:20. F. Somkin. A historical investigation of how the American literary imagination has dealt with the gray area of transgression: Readings on murder, guilt, and retribution on land and sea, from the frontier to the urban jungle.
327-328 American Frontier History
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.

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.

332-334 Native American History
332, Fall; 334, Spring. 4 credits each term.
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.
M W F 10:10; disc to be arranged. Fall: discussions; spring: independent work in consultation with instructors and occasional meetings with the instructor. Not offered 1986–87.
M. B. Norton.
An examination of the process by which the thirteen European colonies became an independent and united nation, with emphasis on political thought and practice, social and economic change, 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.
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, racial and ethnic differences in women’s experiences, and contemporary feminism.

346 Religion in American History
Spring. 4 credits.
Fall. 11:15; disc to be arranged. R. L. Moore.
Examines the interaction of ideas and behavior of American religious groups with American culture and society. The course covers the nineteenth and early twentieth century.

321–322 The American Revolution of 1775–1815
Fall, Spring. 4 credits each term.
M W F 10:10; disc to be arranged. R. L. Moore.
An analysis of the American Revolution in the context of the ideas and behavior of American religious groups with American culture and society. The course covers the nineteenth and early twentieth century.

331 The American Civil War and Reconstruction
M W F 10:10; disc to be arranged. J. H. Silbey.
An analysis of American society from the end of the Civil War to the end of Reconstruction, 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.

336-337 American Social History
Fall, Spring. 4 credits each term.
M W F 10:10. S. Blumin.
A history of American society, with emphasis 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.

344 American ideas from the Puritans to Darwin
4 credits.
American thought and culture from 1580 to the present. Emphasizes the intellectual impact of major political and economic events and the adaptation of social ideas and values to new conditions.

345 The Modernization of the American Mind
Fall. 4 credits.
M W F 11:15; disc to be arranged. R. L. Moore.
Examines the interaction of ideas and behavior of American religious groups with American culture and society. The course covers the nineteenth and early twentieth century.

327–328 American Frontier History
Fall, Spring. 4 credits.
Survey of exploration, settlement, and expansion across North America since the sixteenth century. First term covers international rivalry over territory, frontier trade systems, Indian-colonial relations, and the early administration of United States territories. Topics in second term include the evolution of land and Indian policies, life in frontier communities, and political movements and economic change in the American West.

330 The United States in the Middle Period, 1815–1860
M W F 10:10; disc to be arranged. J. H. Silbey.
An analysis of American society from the end of the war with England to the crisis of 1850, stressing 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.

333-334 The Urbanization of American Society
Fall, Spring. 4 credits each term.
M W F 11:15. S. Blumin.
An examination of the transformation 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.

331-332 The Urbanization of American Society
332, Fall; 333, Spring. 4 credits each term.
M W F 10:10; disc to be arranged. 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 reconstruction and restoration of the seceded states.

336-337 American Social History
Fall, Spring. 4 credits each term.
M W F 10:10. S. Blumin.
A history of American society, with emphasis 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.
[428 Undergraduate Seminar in American Frontier History Spring. 4 credits. Not offered 1985–86.
This seminar examines economic life in frontier regions, focusing comparatively on relations between land and labor. Students will explore forms of work organization and of land use that shaped frontiers from colonial times to the present and will investigate the influence of ethnicity, class, and regionalism on frontier conflict. The evolution of U.S. land policy and ideological concepts linking labor with land are also traced.]

429 Undergraduate Seminar in Indians of Eastern North America Fall. 4 credits.
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 T 2:30–4:30. 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 link labor with land and the present agony of the criminal justice system, and the dissolution of social authority generally.

613–614 Seminar on American Diplomatic History [613, fall]; 614, spring. 4 credits each term.
613 not offered 1985–86.
Hours to be arranged. W. LaFeber.

615–616 Seminar in American Cultural and Intellectual History Not offered 1985–86.
F. Somkin.

617–618 Seminar in Recent American Cultural History Not offered 1985–86.
R. L. Moore.

619 Seminar in American Social History Spring. 4 credits.

621 New Directions in American Cultural History Fall. 4 credits.
Primarily a readings colloquium rather than a research seminar. Emphasis on major new approaches and significant recent books and essays.

624 Graduate Seminar in American Indian History Fall. 4 credits. Not offered 1985–86.

626 Graduate Seminar in the History of American Women Fall. 4 credits.
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.

627 Graduate Seminar in Early American History Spring. 4 credits. Not offered 1985–86.
M. B. Norton.

J. H. Silbey.

[710 Colloquium in American History Spring. 4 credits. Required of all first-year American history graduate students. Not offered 1985–86.
H. Sietz.
Examination of the major themes, epochs, and interpretations of American history.]

Latin American History

295 Colonial Latin America Fall. 4 credits.
M W T 10:10; disc, F T 10:10 or 11:15. 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 rivalry 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 T 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 national and populist politics, revolutionary movements of the twentieth century, and United States—Latin American relations.

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 1985–86.
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.]

649 Undergraduate Seminar in Latin American History Fall. 4 credits. Prerequisite: permission of instructor.
Topic for 1985: race and class in Latin American history.

689 Seminar in Latin American History Not offered 1985–86.
T. H. Holloway.

Asian History

190 Introduction to Asian Civilizations Spring. 4 credits.
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.
The history of Asian civilizations in modern times is introduced, focusing on the relationship 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.
T R 10:10 plus an additional hour, M T 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 cultural 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 11:15; disc to be arranged. Staff.
A survey of the modern history of Southeast Asia.

[397 State, Society, and Culture in Japan to 1750 Fall. 4 credits. Not offered 1985–86.
M W F 9:05. J. V. Koschman.
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. Not offered 1985–86.
M W F 9:05. J. V. Koschman.
A survey of Japan from the mid-eighteenth century to the present, with special attention to changing configurations of institutional structures, 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 1985–86.
How is the "war story" told in postwar Japan? The course will examine persisting 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 of texts, ranging from political thought and history to fiction, film, and poetry.]
Integral to modern European philosophies of history and of the human subject is an image of Asian societies (or the “Orient”) as static and despotic: Hegel posited China as the “childhood of history,” a land where “nothing subjective is recognized.” Max Weber tried to account for the apparent absence of historical change in India by developing the model of an “Asiatic mode of production,” and Max Weber searched in vain through Chinese religion and ethics for an analogue to the Protestant ethic. In this seminar we will consider the Hegelian, Marxian, and Weberian theses in detail, and then turn for comparison to some more recent Western concepts of Eastern societies. Along the way we will critically reflect upon the epistemological and ideological functions of cultural opposites, the issue of cultural universalism versus relativism in social science, and the relationship between theories of history and the practice of imperialism.

492 Undergraduate Seminar in Medieval Chinese History Fall. 4 credits. Prerequisite: History 393 or permission of instructor. Hours to be arranged. C. A. Peterson. Topic for 1985: travelers to China in premodern times in the context of East-West contacts.

[495 Self and Society in Late Imperial and Twentieth-Century China Fall. 4 credits. Prerequisite: History 191 or 394, or permission of instructor. Not offered 1985-86; next offered 1986-87. R 2:30-4:30. S. Cochrane. Conceptions of self and relationships between the individual and society in China from the seventeenth century to the present.]

499 Art and Society in Modern China Spring. 4 credits. Not offered 1985-86; next offered 1986-87. W 9:30-10:30. 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 change 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. 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. Cochrane.

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 to 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. Staff. Introduction to the modern history of Southeast Asia for graduate students. Students will be expected to attend the lectures and to 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 1985-86. Hours to be arranged. C. A. Peterson.]

793-794 Seminar in Medieval Chinese History 793, fall; 794, spring. 4 credits each term. Prerequisite: permission of instructor. Hours to be arranged. S. Cochrane.

795 Seminar in Southeast Asian History Fall. 4 credits. Hours to be arranged. Staff.

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. Not offered 1986-87. Hours to be arranged. J. V. Koschmann.]

Ancient European History

265 Ancient Greece from Homer to Alexander the Great Fall. 4 credits. Open to freshmen. M W 11:15, disc to be arranged. 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 achievements, 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, 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, plus disc to be arranged. 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, Plautus, Josephus, Tacitus, Marcus Aurelius, and biblical and patristic sources.

[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 for whom the character of the world he created, in which the Greek city was placed 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, Epics, and Lucrettus.]

452 The Tragedy of Classical Athens, 462-404 B.C. Fall. 4 credits. Prerequisite: History 265 or 373, or permission of instructor. 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 politics on the great tragedians of the age and the influence of tragedy on the Athenians’ conception of their character and history. Readings from Herodotus, Thucydides, Aeschylus, Sophocles, Euripides, Aristophanes, Plato, Aristotle, and Plutarch.

453 Crisis of the Greek City-State, 415-336 B.C. Spring. 4 credits. Prerequisite: History 265 or 373, or permission of instructor. 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 Western Greeks and Romans. 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, Aristophanes, Plato, Aristotle, Demosthenes, and Xenophon.

Medieval, Renaissance, and Early Modern European History

151-152 Introduction to Western Civilization Fall, spring. 4 credits each term. History 151 is not a prerequisite to 152. T R 11:15, disc to be arranged. F. C. Holmes; 'spring, R. Whalen.

A survey of European history. History 151 covers antiquity to the Reformation. 152 spans the seventeenth century to the present day. The major political and social developments and the intellectual heritage of the West are both studied. A considerable portion of the reading is drawn from contemporary sources.

[257 English History from Anglo-Saxon Times to the Revolution of 1688 Fall, spring. 3 or 4 credits. Not offered 1985-86. M W F 12:20. C. Holmes. A survey of the government, social organization, and cultural and religious experience of the English, laying particular stress on the unification of the realm, the rise of Parliament, changes in agrarian organization, and the development of urban and commercial classes.]

263 The Earlier Middle Ages Fall. 4 credits. M W F 9:20. J. J. John.

A survey of medieval civilization from ca. 300 to ca. 1100, dealing with religious, intellectual, political, and economic developments in Western Europe.

264 The High Middle Ages Fall. 4 credits. T R 10:10-11:25. J. Oakley.

A survey of medieval civilization from ca. 1100 to ca. 1450, dealing with religious, intellectual, political, and economic developments in Western Europe. Lectures and class discussions.


Lectures and discussions on the origins of the Reformation, its impact, and the Catholic response. Topics include the medieval intellectual and social origins of reform, Luther’s Peasants’ War, the Swiss and English reformed, Anabaptism, French wars of religion, witch-hunts, the Council of Trent, and the Jesuits.


The formation of the Spanish empire is contrasted with the emergence of the Dutch nation in the Eighty Years’ War. Comparisons of economy, culture, social structure, religion, and overseas expansion. Lectures and discussions.]

[349 Greece in Late Antiquity and Early Byzantine Times, A.D. 306-586 Not offered 1985-86. B. Strauss.]

350 Early Renaissance Europe Spring. 4 credits. T R 11:15, disc to be arranged. L. Carrington.

An exploration of the intellectual, cultural, religious, and political development of Western Europe from the age of Dante, Ockham, and Marsilius through the several stages of Italian humanism from Petrarch to Pico, down to the generation of Machiavelli and Erasmus, with some attention to the economic, social, and demographic crisis of the fourteenth and fifteenth centuries. Readings and topics about evenly divided between Italy and northern Europe.

[351 The Culture of the Early Renaissance (also Comparative Literature 361 and History of Art 350) Fall. 4 credits. Not offered 1985-86; next offered 1986-87.]}
An examination of the relation between the intellectual life of the guild republic, the age of civic humanism, and the rise of the Medici to the time of Machiavelli. Economic development, and the period immediately succeeding.


E. G. Dotson, Kate, with some lectures by C. Arroyo, C. Holmes, R. Hsia, E. Morris. Although History 361 (also Comparative Literature 361 and History of Art 350) is not a prerequisite, this course is a continuation of that in which the student has been organized and dealt with the period immediately preceding. Members of several departments will lecture on Luther, Michelangelo, Durer, Montaigne, Edmund Spenser, Bodin, and Cervantes. Close reading of texts, literary and visual; discussion will include methods of interpretation and historical analysis.

365 Medieval Culture, 400–1150 Spring. 4 credits. Prerequisite: History 264 or permission of instructor. TR 2:30–3:45. J. J. John. Intellectual and cultural developments in the age of monasticism, from St. Augustine to St. Benedict to St. Anselm and St. Bernard of Clairvaux.

366 Medieval Culture, 1100–1300 4 credits. Prerequisite: History 264 or permission of instructor. Not offered 1985–86. J. J. John. The origin and development of the universities will be studied as background for a consideration of the scholastic movement 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 263–264 or permission of instructor. Not offered 1985–86. TR 3–4:5. B. Tierney. Relationships between ecclesiastical and secular authorities and the ways in which these relationships influenced the growth of government in the Middle Ages are considered. Particular attention is given to the development of medieval constitutionalism.

368 Francis of Assisi and the Franciscans Fall. 4 credits. Limited to 12 students. Prerequisite: History 264 or permission of instructor. Not offered 1985–86. 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, 1250–1530 Spring. 4 credits. Not offered 1985–86. TR 11:15; disc to be arranged. J. Najemy. Florentine politics and society 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. TR 2:30–4:30. 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, religious toleration, witchcraft, and the role of women and the family.

374 War, Trade, and Empire, 1500–1815 Spring. 4 credits. Not offered 1985–86. M W 2:30–4. 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.

368 Undergraduate Seminar in Renaissance History Fall. 4 credits. Not offered 1985–86. Hours to be arranged. J. Najemy.

469 Seminar in the Reformation Spring. 4 credits. Prerequisite: permission of instructor. Hours to be arranged. R. Hsia. An introduction to the historiography and sources of the Reformation.


475 Seminar in the English Civil War, 1640–1660 Fall. 4 credits. Not offered 1985–86. C. Holmes. A close analysis of the causes and development of the war, and of the radical constitutional, religious, and social experiments of the period. Particular attention will be paid to the evaluation of the intense historiographic controversies surrounding this period in the light of the primary sources.

485 The Transformation of Feudal Society Fall. 4 credits. Not offered 1985–86. 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.

569 Seminar in Society and Religion in Early Modern Europe Fall. 4 credits. Not offered 1985–86. 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.


663 Seminar in Renaissance History Spring. 4 credits. Open to qualified undergraduates with permission of instructor. Not offered 1985–86. Hours to be arranged. J. Najemy. Topic to be announced.

664–665 Seminar in Latin Paleography 664, fall 665, spring. 4 credits each term. Hours to be arranged. J. J. John.

866 Seminar in Medieval History Fall. 4 credits. Not offered 1985–86. J. J. John.


Modern European History

152 Introduction to Western Civilization Spring. 4 credits. TR 12:15; disc to be arranged. R. Whalen. The second half of the European history survey, 152 covers the seventeenth century to the present day. The major political and social developments and the intellectual heritage of the West are both studied. A considerable portion of the reading is drawn from contemporary sources.


283 Contemporary European Society and Politics (also Government 283 and German Literature 283) Spring. 4 credits. No formal prerequisites. Not offered 1985–86. R. C. E. plus disc to be arranged. J. H. Weiss, S. G. Tarrow. An introduction to European societies, their development, and current dynamics. The course is designed for students with an interest in, or experience of, various European countries and who wish to increase their knowledge of Western Europe.

285 Contemporary European Society and Politics (also Government 283 and German Literature 285) Fall. 4 credits. TR 2:30–3:45. S. Gilman, R. Hsia, J. Pontusson. This course provides a general introduction to modern European society and politics. Focusing on Britain and the countries of northern Europe, we will explore the meaning of current events and issues from a historical perspective. Topics for the fall of 1985 will include the legacy of colonialism, class culture and the role of organized labor, immigrant workers and ethnic minorities, problems of national identities, new social movements (e.g., the "Greens" in West Germany), and European perceptions of the United States. The course will pursue these themes through films, newspaper articles, and literature as well as critical writings. The course is designed for students with an interest in, or experience of, various European countries, who wish to increase their knowledge of Western Europe. There are no formal prerequisites.

352 The End of the Austro-Hungarian Monarchy, 1848–1919 Fall. 4 credits. M W 8:05; disc W 10:10 and 2:30. J. O. R. Hull. The decline and fall of the multinational empire. Emphasis is on the political and social problems presented to the monarchy both by industrialization and by the increasingly restive subject nationalities (Poles, Czechs, Serbs, Croats). How did the monarchy handle these problems? Why did it fail? Focus is on cultural matters. Readings are drawn from Freud, Schnitzler, Hofmannsthal, Karl Kraus, Joseph Roth, and others.

353 Nineteenth-Century European Intellectual History Fall. 4 credits. Not offered 1985–86; next offered 1986–87. TR 12:20–1:35. D. LaCapra. The focus is on social and cultural thought in France, Germany, and England. Topics include reactions to the French Revolution and industrialization; the definition of conservative, liberal, and radical perspectives; and the relation between literature and social thought. Readings include Tocqueville, Mill, Hegel, Marx, Stendhal, Flaubert, Dostoevsky, Nietzsche, and Durkheim.

354 Twentieth-Century European Intellectual History Fall. 4 credits. Not offered 1985–86; next offered 1986–87. TR 12:20–1:35. 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 poststructuralism. Readings include Weber, Freud, Heidegger, Sartre, Carnus, Mann, Woolf, Foucault, and Derrida.

T R 2:30–3:50 S. L. Kaplan.
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.

T R 2:30–3:50 S. L. Kaplan.
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 desires to destroy and to create, and the implications of the Revolution for the modern world.

M W 9:05; disc, W 10:10 or 1:25. I. V. Hull.
An examination of the Reich, 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, T 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, socialist dislocations of World War I; failure 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.
T R 10:10–11:20 W. M. Pintner.
The origin and development of the fundamental social, political, economic, and cultural institutions that have determined the nature of contemporary Soviet society.

[363] Russian History since 1800 Spring. 4 credits. Open to freshmen.
T R 10:10–11:20 W. M. Pintner.
Nineteenth- and twentieth-century Russia, with emphasis on the major social, political, and economic changes that have transformed Russia since the mid-nineteenth century.

M W 1:25; disc to be arranged. J. H. Weiss.
The transformation of European society and culture in the twentieth century, including a critical examination 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 patterns of work and leisure; and aspects of popular culture.

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 and 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 why the war was so long and destructive, afterwards, no one could put the pieces back together again.

[383] European in the Twentieth Century 3 credits. fall, 384, Spring. 4 credits each term. History 383 is not a prerequisite to 384. Not offered 1985–86.
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. Special topics include the reorientation of liberal and democratic socialism; the transforming effects of war and depression, the dynamics and diplomacy 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. Special 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 1968, the end of dictatorship in Spain, and the socialist experiment in France, and the politics of the arms race.

M 2:30–4:30 W. M. Pintner.
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 of population to family and social structure, economic growth, political stability, collective mentality, etc. Readings in European and American history from the Black Plague through the Industrial Revolution.

M 2:30–4:30. S. L. Kaplan.
A comparative study of the meaning of work in different societies from premodern times to the present. Emphasis on the "representations" of work of the actors themselves who worked, as well as those who 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.
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.


[456] Europe between the World Wars Spring. 4 credits. Hours to be arranged. R. Whalen.
A seminar on European culture and politics, 1918–1939. Using primary literary and visual sources, this seminar will investigate themes such as the cultural experimentation of the twenties and thirties, the crisis of liberal democracy, and the emergence of totalitarianism.

[466] Seminar on Germany, 1890–1918 4 credits. Prerequisite: permission of instructor. Not offered 1985–86. I. V. Hull.
A consideration of the many paradoxes of the Wilhelminian age—the last decades of the monarchy, as it wrestled with economic and social change.

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.

R 2:30–4:30 D. A. Baugh.
Perspectives on the landed aristocracy’s continuing domination of politics. Topics include the political system, political and social thought, aristocratic life-style, property, 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 1985–86.

[471] Russian Social History Spring. 4 credits. Prerequisite: one semester of Russian history or permission of instructor.
W 12:20–2:20 W. M. Pintner.
A seminar devoted to an examination of the diverse social groups that comprise Imperial Russia and Soviet society. Includes systematic comparison with other countries.

W 12:20–2:20 E. S. D. LaCapra.

[476] Documenting the Depression: Film, Literature, and Memory 4 credits. Prerequisite: permission of instructor. Not offered 1985–86.
W 12:20–2:20 J. H. Weiss. A seminar on the social experience of the depression in Europe as expressed in print and visual media. Topics include the dynamics and effects of the depression, its impact on various communities, family life, and poverty and unemployment.

M 2:30–4:30 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.


[480] Twentieth Century Britain Fall. 4 credits. Not offered 1985–86.
Lectures focus on key personalities. Seminar topics include Roosevelt, Churchill, and 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.
[483] Seminar in Modern European Social History

490 The Role of Asia in Modern European Discourse on History and Society (also Society for the Humanities 421)
Fall. 4 credits. Prerequisite: permission of instructor.
W 12:30–2:15. J. V. Koschmann.

[455] Seminar in Eighteenth-Century British History

[456] Seminar in Nineteenth-Century British History

[471] Seminar in the French Revolution
Not offered 1985–86. S. L. Kaplan.

[472] Seminar in European Intellectual History

[473] Seminar in European Intellectual History
D. LaCapra.

677 Seminar in Russian History
Spring. 4 credits. Hours to be arranged. W. M. Pinter.

678 Seminar in Modern European Social History
Fall. 4 credits. Not offered 1985–86. Hours to be arranged. J. H. Weiss.
Research seminar. Topic: education, professional structures, and social stratification since 1800.

[479] Seminar in European History
Not offered 1985–86. 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 is 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.

410 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
730, fall; 704, spring. 4 credits each term. Open only 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.

Hours to be arranged. C. Holmes and 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

Japan and Modernity: A Special Case of Orientalism (Society for the Humanities 422)

Eastern and Western Science: Is Science a Western Phenomenon? (Society for the Humanities 427)
Fall. 4 credits. W 2:30–4:15. F. J. Ragep.

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, historic, and cultural contexts. Courses offered by the department cover the mainstream of Western art (classical, medieval, Renaissance, baroque, nineteenth and twentieth century) and non-Western art, including Oriental and tribal traditions. Art history is an integral part of interdisciplinary programs such as the Archaeology Program, Africana Studies, 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 design a coherent program of courses for 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 higher) and a 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 major courses offered by the Department of Art, but these are considered to be electives and do not fulfill major requirements.

Honors
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 to 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 major program that 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. Fall: M W F 10:10 or 12:20, or T R 10:10–11:25. Spring: M W F 10:10, 11:15, or 12:20, or T R 12:20–1:35. 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 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. Not open to students who have taken History of Art 103.
Fall: M W F 11:15; spring: M W F 1:25.

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.

[106 Art in a Landscape: Traditional Arts in Southeast Asia

[107 Principles of Architecture

Courses

215 Introduction to Art History: African Art
Fall. 3 credits. T R 8:40–9:55. N. Neaher.
The cultural foundations of art in sub-Saharan Africa, including a selected examination of masking traditions; royal arts; body aesthetics; figurative sculpture; architecture; and relationships with Western developments in art.

216 Introduction to Art History: The Arts of Africa, Oceania, and the Americas
Spring. 3 credits. T R 8:40–9:55. N. Neaher.
A preliminary exploration of the arts of Africa, Oceania, and pre-Hispanic and native America, which will introduce students to visual themes and their cultural bases. Case studies will illuminate issues such as the role of the artist in society, functional imperatives, aesthetic "systems," transformations in style, and exchanges in influence with art and culture of the West.

220 Introduction to Art History: Art of the Classical World (also Classics 220)
The archaeology of the ancient Greeks and Romans as seen from a critical perspective. Major developments in Classical archaeology will be traced, from treasure hunting to modern scientific research. Examples illustrating various approaches will be chosen: 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.

221 Introduction to Art History: Minoan-Mycenaean Art and Archaeology (also Classics 221)
Fall. 3 credits. M W F 10:10. J. Coleman.
The birth of civilization in Greece and the Aegean Islands during the Bronze Age. The main focus is on the rise and fall of Minoan Crete and Mycenaean Greece, with consideration given to the nature and significance of Aegean interactions with Egypt, the Near East, and Anatolia. Topics also include Cyprus as
an intermediary between the Aegean and the eastern Mediterranean, the effects of the volcanic eruptions of Santorini-Thera, and the evidence of Homer and the Greek myths.

230 Introduction to Art History: Monuments of Medieval Art Fall. 3 credits. MWF 11:15. R. G. Calkins.

An introduction to the approaches to art history through a study of selected works of art from the Middle Ages: architecture, sculpture, painting, manuscript illumination, metal work, and ivory.


A study of selected works of architecture, sculpture, and painting in Italy and northern Europe from about 1000 to about 1575. Major artists considered include Donatello, Jan van Eyck, Michelangelo, and Bruegel. Various approaches to the understanding of works of art and various interpretations of the Renaissance are explored.

250 Introduction to Art History: The Baroque Era Spring. 3 credits. MWF 10:10. C. Lazzaro.

A survey of the art and architecture of Italy, France, Spain, Holland, and Flanders in the seventeenth century. A few artists such as Bernini, Rembrandt, and Velazquez will be emphasized and placed within the context of the major trends and ideas of the time. In addition to distinguishing artistic styles and aesthetic concerns, the course will consider other cultural factors shaping the work of art, such as patronage, religion, politics, and economics.

261 Introduction to Art History: Modern Art Fall. 3 credits. TR 10:10–11:25. F. Colpitt.

A topical discussion of some of the major artists, movements, and ideas that make up modern art. Emphasis is on European and American painting of the nineteenth and twentieth centuries.


290 Introduction to Art History: Architecture and Environment Fall. 3 credits. Limited to 50 students. MWF 12:20. T. M. Brown.

Emphasis is placed on the social and humanistic aspects of nineteenth- and twentieth-century design. After a lengthy introduction to the architectural categories of space, form, function, and structure, the ideas and forms that have influenced the physical shape of the contemporary world are considered. Participants are expected to read one book per week, to be discussed on Fridays.


320 The Archaeology of Ancient Greece (also Classics 320) Spring. 4 credits. Prerequisite: Classics 220 or permission of instructor. MWF 12:25. J. Coleman.

Recent developments in the archaeology of Athens from the Geometric period to late antiquity. Topics will include consideration of the nature of Athenian society and an assessment of the influence of Athens on the rest of the Greek world and beyond.

321 The Archaeology of Cyprus (also Classics 321) 4 credits. Not offered 1985–86.

322 Arts of the Roman Empire (also Classics 322) 4 credits. Not offered 1985–86. A. Ramage.

323 Painting in the Greek and Roman World (also Classics 323) 4 credits. Not offered 1985–86.

324 Architecture in the Greek and Roman World (also Classics 324) 4 credits. Not offered 1985–86.

325 Greek Vase Painting (also Classics 325) 4 credits. Not offered 1985–86. A. Ramage.

326 Art and Archaeology of Archaiac Greece (also Classics 326) 4 credits. Not offered 1985–86.

327 Greek and Roman Coins (also Classics 327) 4 credits. Not offered 1985–86. A. Ramage.


329 Greek Sculpture (also Classics 329) 4 credits. Not offered 1985–86. A. Ramage.


332 Architecture in the Middle Ages (also Architecture 332) Spring. 4 credits. MWF 9:05. R. G. Calkins.

A survey of medieval architecture from the Early Christian period to the Late Gothic (A.D. 300–1500). Considerable emphasis will be placed on the development of structural systems and upon the form, function, and meaning of important medieval buildings.


The painting and sculpture of the thirteenth and fourteenth centuries, primarily in France but with reference to important manifestations of the Gothic style in England, Germany, Bohemia, and Italy.


343 Italian Renaissance Art of the Fifteenth Century 4 credits. Not offered 1985–86.


A thorough examination of the works of these three masters and of their cultural and historical environment.

Primary emphasis is on their painting, sculpture, and architecture, but the writings of Leonardo and Michelangelo are also considered.


357 European Art of the Eighteenth Century Fall. 4 credits. MWF 12:20. E. G. Dotson.

A study of tradition, change, and revolution in the architecture, painting, sculpture, and minor art of eighteenth-century Europe. The course will be organized around a selected sequence of European centers where the various styles underwent an especially brilliant, original, or influential development and an effort will be made to relate these developments to the cultural background of the period of these centers.


362 European Art 1900–1940 Spring. 4 credits. TR 8:40–9:55. L. Meixner.

A survey of the major movements in European art during the first half of the twentieth century: fauvism, German expressionism, cubism and its satellite schools, dada, and surrealism. Emphasis will be placed on major artists, including Matisse, Picasso, Kirchner, Kandinsky, and Duchamp. Relevant political background influencing the period is included as well.


365 Art from 1940 to the Present Spring. 4 credits. TR 10:10–11:25. J. Bernstock.

Major movements and figures working in the United States since 1940, beginning with abstract expressionism and continuing to conceptual art, feminist art, and neo-expressionist art. Some attention is devoted to the critical reception that artists have received, but major emphasis is on the artists’ statements themselves.


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-scape of the nation’s capital. The vocabulary of architectural analysis and criticism will be taught. Field trips required.
Individual investigation and discussion of special topics not covered in the regular course offerings, by arrangement with a member of the department.

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. Staff.

Individual investigation and discussion of special topics not covered in the regular course offerings, by arrangement with a member of the department.


431 Greek Sculpture (also Classics 431) 4 credits. Not offered 1985–86. A. Ramage.


Topic for 1986: methodological approaches to Netherlandish painting. Close readings of Panofsky and Friedlander as well as contemporary authors who address problems in history and art.


Topic for 1986: concepts of manierism. A critical study of the concept of manierism and a detailed investigation of several specific paintings, buildings, and other sixteenth-century works that are considered to be manierist. Weekly reading assignments will be discussed in class. A term paper on a topic of the student’s choice is required. Open to undergraduates with some background in Renaissance art and to graduate students.


461 Expressionistic Movements, Schools, and Artists Fall or spring. 4 credits. Only for students in the Cornell Abroad program in Hamburg, Germany. H. P. Kahn.

A historical and comparative study of various positions taken by certain painters and writers, positions we call “expressionist.” Structural and methodological modes practiced by individuals and groups that distinguish their work from other, nonexpressionist positions. The emphasis is on key periods and figures, especially van Gogh, Munch, the “Brueckle,” the Munich group, Hans Hofmann, and the American abstract expressionists. The first semester will cover the early expressionists up to 1900, and the second semester will deal with the Americans up to ca. 1960. The relation of the visual and literary arts will be studied (suggested readings: Krauss, Doblin, Toiler Brecht, O’Neill, Dos Passos, etc.). The political and religious connections play an important part in the course.


The art of the Barbizon community is of central significance to the development of French painting during the second half of the nineteenth century. As a group of painters who lived in a rural peasant community where they frequently worked out-of-doors, these artists brought both genre and landscape scenes into a new era of monumentality and modernism. Reflecting the awakened democratic sensibilities of the 1850s, certain artists portrayed the epic quality of rural labor; others, alive to their rustic environment, combined scientific thought and pantheist belief to forge a new landscape style. The result was of paramount significance to the young French impressionists. The seminar will examine both Barbizon genre and landscape art through the works of Jean-Francois Millet, Theodore Rousseau, Camille Corot, Diaz de la Pena, and others. Included in the discussions are works by Claude Monet, Camille Pissarro, and Vincent van Gogh, which received direct inspiration from their Barbizon precursores.

463 Studies in Modern Art Fall. 4 credits. W 2:30–4:30. L. Meixner.

Topic for 1986: postimpressionism in France. This seminar addresses the lively experimentation that characterized French art in the final decades of the nineteenth century. Capitalizing on the innovations of the impressionists, the postimpressionist generation developed further roads leading toward modernism. A new awareness of nature, scientific and emotional; a keen alertness to individual psychology; and the direct observation of contemporary life conferred upon their art a dynamism. Reflecting the individual personalities, including Henri de Toulouse-Lautrec, Georges Seurat, Vincent van Gogh, Paul Gauguin, Edgar Degas, and their contemporaries, are examined with respect to their artistic, literary sources, sociocultural milieu, and autobiographies. Discussions will focus on the way in which these artists encompassed and extended their impressionist heritage, stylistically and psychologically to meet the needs of their time.


Topic for 1986: to be announced.


Many modernists base their arguments on a belief in a better, indeed in a perfect, future for industrialized societies. Others, appalled by the implications of modernists’ views, formulated opposing positions. The seminar will concentrate on the nature of Utopian thought from the late nineteenth through the mid-twentieth century, using works of H. G. Wells, William Morris, Aldous Huxley, Le Corbusier, B. F. Skinner, and others as case studies of the Utopian and anti-Utopian strain in modernist art and architectural thought.

156 Arts and Sciences


476 Seminar in American Art Fall. 4 credits. M. W. Leavitt. Topic for 1986 to be announced.

[581 The Arts in Modern China 4 credits. Not offered 1985–86.]


[583 Chinese Art of the T'ang Dynasty 4 credits. Not offered 1985–86.]


[584 Traditional Arts of Southeast Asia 4 credits. Not offered 1985–86.]

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. Prerequisite: History of Art 493. 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.

[585 The Empire in Transition 4 credits. Not offered 1985–86.]

531 Problems in Medieval Art and Architecture Fall. 4 credits. R. G. Calkins. Topic for 1985: Late Flemish Manuscripts. An investigation of various approaches to the study and analysis of late Flemish manuscripts. Weekly readings, discussions, and a final research paper.

540 Seminar in Renaissance Art Fall. 4 credits. C. Lazzaro. Topic for 1985: Italian Renaissance gardens. An overview of the state of scholarship to date. Emphasis will be on particular problems raised by the gardens and the research tools necessary for solving them. The seminar has two aims: to examine the gardens thoroughly and critically and to provide background in the source material in this and other related fields of Renaissance scholarship. Open to graduate students and to advanced undergraduates with background in the Renaissance. A research paper is required.


564 Problems in Modern Art: Post-1940 American Art Fall. 4 credits. F. Colpitt. Topic for 1985 to be announced.

580 Problems in Asian Art Fall. 4 credits. S. J. O'Connor. Topic for 1985: critical review of selected works on earlier Southeast Asian art.

591–592 Supervised Reading 591, fall; 592, spring. 4 credits. May be repeated for credit. Limited to graduate students. Staff.

[594 Methodology Seminar I 4 credits. Not offered 1985–86.]

595 Methodology Seminar II Spring. 4 credits. M. W. Leavitt. An examination of various methods of investigation in the history of art and architecture. Required of all graduate students.

[596 Problems in Art Criticism 4 credits. Not offered 1985–86.]

Related Courses in Other Departments

The Semantics of Place in Literature and Art (Comparative Literature 445) Spring. See also the courses given by the Department of Classics.

Javanese

See Modern Languages, Literatures, and Linguistics.

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, 256-6457.

Latin

See Department of Classics.

Linguistics

J. W. Gair, director of undergraduate studies (407 Morrill Hall, 256-5110). 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. An 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, indicator underclass courses; 3, 4, upperclass courses; 5, 6, graduate courses. The subject matter of courses 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, others.

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 Students," 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 212–222 or 293–294. A unit on infinite series is required. Such a unit is offered in Mathematics 112, 122, and 192. (Students with two semesters of advanced placement usually have had the equivalent of 171.) 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. Alternatives 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.
For Prelaw or Premed (second example) or Prebusiness


*Computer Science 100–211.


A course in statistics is also strongly recommended.

Honor. 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 109*</td>
<td>1) Algebra and trigonometry to prepare students for calculus</td>
</tr>
<tr>
<td>or Mathematics 107</td>
<td></td>
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<tr>
<td>or Mathematics 105</td>
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<td>or Mathematics 108</td>
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<td>or Mathematics 112</td>
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<td>or Mathematics 113</td>
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<td>or Mathematics 213</td>
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<td>or Mathematics 221</td>
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<tr>
<td>or Mathematics 222</td>
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<tr>
<td>Computer Science 100</td>
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<tr>
<td>or Physics 207–208</td>
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<tr>
<td>or Computer Science 211</td>
<td>provided no Computer Science course has been used toward satisfying the previous requirement.</td>
</tr>
<tr>
<td>or Computer Science 411</td>
<td>or higher.</td>
</tr>
<tr>
<td>or Physics 112 or 207</td>
<td></td>
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</tbody>
</table>

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 191–192–221 or 222.

Computer Science 100, Physics 207–208.


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 Emphasis on Computer Science

First two years: Mathematics 111–122–221–222, Computer Science 100–211.


Two or more semesters of computer science are highly recommended.

For Emphasis on Operations Research

First two years: Mathematics 111–122–221–222 or 191–192–221 or 222.

Computer Science 100–211.


Requirement 5 is met by Computer Science 481 in this sample program. Students interested in computer science need to 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 191–192–283–294, 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.


The sophomore courses Mathematics 221–222 are recommended rather than 293–294 in this sample because they provide better preparation for 411.
Functions, enumeration, permutations and combinations, probability, vectors and matrices. Markov chains.

108 Introduction to Calculus Spring. 3 credits. Intended primarily for students in the more descriptive areas of the social sciences. Prerequisite: three years of high school mathematics, including trigonometry and analytic geometry of the line and circle. Recommended: Mathematics 107. This course does not normally provide adequate preparation for any higher course in mathematics, nor can it be used toward fulfillment of the mathematics requirement for biology majors.*

Lecs, TR 12:20, plus 2 hours to be arranged. Prelims: 7:30 p.m., Feb. 20, Mar. 20, Apr. 22. Behavior of functions, introduction to differential and integral calculus, elementary differential equations.

109 Precalculus Mathematics Fall or summer. 3 transcript credits only; cannot be used toward graduation.

This course is designed to prepare students for Mathematics 111 or 108. Algebra, trigonometry, logarithms, and exponentials are reviewed.

111 Calculus Fall, spring, or summer. 4 credits. Prerequisite: Mathematics 109 or three years of high school mathematics, including trigonometry.* Hours to be arranged (department and time roster). Lec: MWF 9:05 or 10:10, or 11:15. Prelims: fall, 7:30 p.m., Oct. 3, Oct. 31, Nov. 19; spring, 7:30 p.m., Feb. 25, Apr. 1, May 6.

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. Prerequisite: Mathematics 111 or 111 plus a grade of B or better, or exceptional performance in 108. Those who do extremely well in Mathematics 111 or 113 should take 122 instead of 112, unless they plan to continue with 213.*

Hours to be arranged (see course and time roster). Lecs: fall, 7:30 p.m., Oct. 3, Oct. 31, Nov. 21; spring, 7:30 p.m., Feb. 25, Apr. 1, May 6.

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 1965–66.*

122 Calculus Fall or spring. 4 credits. Prerequisite: performance at a high level in Mathematics 111 or 113 or permission of the instructor. Students planning to continue with Mathematics 213 are advised to take 122 instead of this course.*


Differentiation and integration of elementary 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.

192 Calculus for Engineers Fall, spring, or summer. 4 credits. Prerequisite: Mathematics 191 or 193.*

Fall: lecs, MWF 9:05 or 11:15, plus 2 hours to be arranged. Prelims: fall, 7:30 p.m., Oct. 3, Oct. 31, Nov. 21, spring, 7:30 p.m., Feb. 27, Apr. 1, May 6.

Methods of integration, polar coordinates, vectors and parametric equations, vector functions of one variable, infinite series, complex numbers, introduction to partial derivatives.

213 Calculus Fall, spring, or summer. 4 credits. Prerequisite: Mathematics 112, 112, or 112.

Lecs, MWF 10:10, plus 2 hours to be arranged. Prelims: fall, 7:30 p.m., Oct. 3, Oct. 31, Nov. 21, spring, 7:30 p.m., Feb. 27, Apr. 1, May 6.


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: MWF 9:05, 10:10, or 11:15. Spring MWF 10:10 or 11:15. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 31, Nov. 21; spring, 7:30 p.m., Feb. 27, Apr. 1, May 6.

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: MWF 11:15 or 12:20. Spring: MWF 9:05 or 10:10 or 11:15. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 31, Nov. 21; spring, 7:30 p.m., Feb. 27, Apr. 1, May 6.

Vector differential calculus, calculus of functions of several variables, multiple integrals.

223 Engineering Mathematics with Microcomputers Fall or spring. 4 credits. Prerequisites: Mathematics 221 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.*

Fall: lecs, M 10:10, 11:15, or 12:20, plus one hour to be arranged, plus four three-hour computer labs during the semester. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 31, Nov. 21; spring, 7:30 p.m., Feb. 27, Apr. 1, May 6.

Partial derivatives, multiple integrals, first- and second-order ordinary differential equations with applications in the physical and engineering sciences, but with four microcomputer experiments using computer algebra to solve problems.

294 Engineering Mathematics with Microcomputers Fall or spring. 4 credits. Prerequisite: Mathematics 293.*

Fall: lecs M 10:10 or 12:20, plus one hour to be arranged, plus four three-hour computer labs during the semester. Prelims: fall, 7:30 p.m., Sept. 23, Oct. 31, Nov. 21; spring, 7:30 p.m., Feb. 27, Apr. 1, May 6.

Vector spaces and linear algebra, matrices, eigenvalue problems, and applications to systems of linear differential equations. Vector calculus. Boundary-value problems introduced to Fourier series. Taught with four microcomputer experiments using computer algebra to solve problems.

General Courses

Students who want a general introductory mathematics course are advised to take Mathematics 107–108.

[401 Honors Seminar Not offered 1985–86.]*

[403 History of Mathematics Spring. 4 credits. Prerequisite: one term of calculus and permission of instructor. Not offered 1985–86.]

TR 10:10–11:25. Topics in mathematics from antiquity to the present.]

690 Supervised Reading and Research Variable credit (up to 6 credits each term).

Applied Mathematics and Differential Equations

421 Applicable Mathematics Fall, spring, or summer. 4 credits. Prerequisites: high level of performance in Mathematics 294, or 221 and 222, or 213 and 213. Graduate students who need mathematics extensively 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.


422 Applicable Mathematics Fall, spring, or summer. 4 credits. Prerequisite: Mathematics 421; however, students who have not taken 422 should talk to the instructor before taking this course.


425 Numerical Solutions of Differential Equations Spring. 4 credits. Prerequisites: Mathematics 294 or 221, one course numbered 300 or higher in 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.

TR 10:10–11:25. Covers the basic existence, uniqueness, and stability theory together with methods of solution and methods of approximation. Topics include singular points, series solutions, Sturm-Liouville problems, 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.

TR 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 need measure 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.

TR 8:40–9:55.

An introduction to the theory of functions of real variables, stressing rigorous logical development of the subject rather than technique 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; 413, Fall; 414, Spring. 4 credits each. Prerequisite: Mathematics 222.

TR 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 215. May be offered only in alternate years.

TR 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.


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.

MWF 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. Prerequisite: Mathematics 221, 294, or 231.

MWF 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 Latin squares, elementary coding theory, or fast Fourier transform; difference equations. Additional topics may be chosen by the instructor.

431–432 Introduction to Algebra Fall; 431, Fall; 432, Spring. 4 credits each. Prerequisite: Mathematics 221 or 231. Undergraduates who plan to attend graduate school in mathematics should take 433–434.

MWF 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 433, Fall; 434, Spring. 4 credits each. Prerequisite: Mathematics 221 or 231.

MWF 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 451, Fall or Summer; 452, Spring. 4 credits each term. Prerequisite: Mathematics 221 or 231 or permission of instructor.

Fall. MWF 11:15–12:00.

Foundations of geometry. Various geometric topics, including Euclidean, non-Euclidean, and projective geometry and rigidity theory.

453 Introduction to Topology Fall. 4 credits. Prerequisite: Mathematics 411 and 221, or permission of instructor.

MWF 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 Moebius 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 453 is not a prerequisite.

MWF 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.*

MWF 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.

Lec, MWF 11:15; rec, R 12:20. Evening prelims may be given. 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.

Mathematics 159

MWF 9:05. Evening prelims may be given. 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.

MWF 11:15.

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


[386 Applied Logic (also Computer Science 486) Spring. 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, plus one-hour lab to be arranged. Propositional and predicate logic, compactness and completeness by tableau and resolution. Reduction of Logical equation. Hilbert 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.

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.

[503 History of Mathematics 4 credits.

Prerequisites: Mathematics 511 and 531. Intended for graduate students in the mathematical sciences. Not offered 1985–86. 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, Moehl, Hilbert, Steinitz, Artin, and E. Noether. Typical authors in analysis who will be studied are Cauchy, Fourier, Bolzano, 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.]

511–512 Real and Complex Analysis Fall; 511, Fall; 512, Spring.

511: measure and integration, functional analysis. 512: complex analysis, Fourier analysis, and distribution theory.

513–514 Topics in Analysis Fall; 513, Fall; 514, Spring.

515–516 Mathematical Methods in Physics Fall; 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. A brief discussion of some basic notions: metric space, vector space, linearity, continuity, integration. Generalized functions (Schwartz distributions). Fourier series and Fourier integrals. Saddle points and 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.


521 Measure Theory and Lebesgue Integration Fall. Measure theory, integration, and \( L_p \) spaces.


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, principal decomposition, Hilbert basic theorem, local rings.

537 Elementary Number Theory Fall. Prerequisites: Mathematics 432 and 412.

540 Number Theory Fall. Prerequisites: Mathematics 432 and 412. Subjects include quadratic forms, quadratic reciprocity, and other topics.


552 Differential 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 undergraduate seniors and beginning graduate students. The first part of the course will stress examples and constructions of manifolds. Topics will include the fundamental group and covering spaces, non-smooth manifolds, immersions and embeddings, tangent bundles, tubular neighborhoods, transversality, cobordism, vector fields and dynamical systems, foliations.


571–572 Probability Theory 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 521.


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, and sufficiency, and the methods 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.


575 Sequential Analysis, Multiple Decision Problems Not offered 1985–86.

577 Nonparametric Statistics 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


622 Riemann Surfaces Not offered 1985–86.

623 Several Complex Variables Not offered 1985–86.

627 Seminar in Partial Differential Equations Fall or spring.

631–632 Seminar in Algebra 631, spring; 632, spring.

635 Topics in Algebra I Fall. Not offered 1985–86. Selection of advanced topics from algebra, algebraic number theory, and algebraic geometry. Course content varies.

637 Algebraic Number Theory Fall. Not offered 1985–86.

639 Topics in Algebra II Fall. Not offered 1985–86. Selection of advanced topics from algebra, algebraic number theory, and algebraic geometry. Course content varies.

640 Homological Algebra Spring.

651–652 Seminar in Topology

653–654 Algebraic Topology 653, fall; 654, spring. Duality theory in manifolds, applications, cohomology operations, spectral sequences, homotopy theory, general cohomology theories, categories and functors.

655 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.

657–658 Advanced Topology Fall. Selection of advanced topics from modern algebraic, differential, and geometric topology. Course content varies.

661–[662] Seminar in Geometry 661, spring; [662 not offered 1985–86.]

667 Algebraic Geometry Fall.

670 Topics in Statistics 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.

671–672 Seminar in Probability and Statistics

674 Multivariate Analysis Not offered 1985–86.


677–[678] Stochastic Processes 677, fall; [678 not offered 1985–86.]

681–682 Seminar in Logic


685 Metamathematics Not offered 1985–86. Topics in metamathematics. Course content varies.


688 Automatic Theorem Proving (also Computer Science 688) Fall. Prerequisites: Mathematics 581. Some feeling for what is computationally feasible, using existing and near-term technologies, would be helpful. Automatic theorem proving is that area of formal logic concerned with proof-theoretic computational efficiency. This course will survey the following areas: (1) machine-oriented predicate calculus systems (resolution and natural deduction styles); (2) computational complexity of the decidable fragments of predicate calculus and other frequently occurring decidable theories (e.g., Presburger arithmetic); (3) rewrite rule systems, which simplify expressions in algebraic theories to normal forms, and the basic theorems in universal algebra that guarantee that such normal forms exist; (4) languages for knowledge representation, which facilitate the accessing of content of possibly useful prior results; (5)
Modern Languages, Literatures, and Linguistics

Courses in modern languages, literatures, and linguistics are offered by various departments of the college. Most courses in modern languages and linguistics are offered by the Department of Modern Languages and Literatures (see Linguistics, pp. 171–173). Literature courses, and certain language courses as well, are taught by the following departments:

Africana Studies and Research Center: Swahili
Asian Studies: Chinese, Japanese
Classics: Greek, Latin
German Literature: German
Near Eastern Studies: Akkadian, Arabic, Aramaic, Hebrew
Romance Studies: French, Italian, Portuguese, Spanish
Russian Literature: Russian

The Full-Year Asian Language Concentration (FALCON Program) offers intensive instruction in Chinese, Japanese, or Indonesian to students wishing to gain fluency in the language in a single year.

Arabic
213–214 Egyptian Arabic 213, fall; 214, spring. 3 credits each term.

See further listings under Near Eastern Studies.

Bengali
121–122 Elementary Bengali 121, fall; 122, spring. 4 credits each term. Prerequisite: for Bengali 122, Bengali 121 or examination.

Burmese
101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Burmese 102: Burmese 101 or equivalent.

Burmese Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Burmese 201, qualification in Burmese; for Burmese 202, Burmese 201.

Burmese Directed Individual Study 301, fall; 302, spring. 4 credits each term. Prerequisites: for Burmese 301, Burmese 202 or permission of instructor.

Cambodian (Khmer)
101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Cambodian 102: Cambodian 101 or equivalent. Sec, M–F: 8; lec to be arranged. F. E. Huffman.

Cambodian Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Cambodian 201, qualification in Cambodian; for Cambodian 202, Cambodian 201.

Cambodian Directed Individual Study 301, fall; 302, spring. 4 credits each term. Prerequisites: for Cambodian 301, Cambodian 202 or permission of instructor.

Cebuano (Bisayan)
101–102 Basic Course 101, fall; 102, spring. Offered according to demand. 6 credits each term. Prerequisite for Cebuano 102: Cebuano 101 or equivalent.

Chinese
Language and Linguistics
101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Chinese 102: Chinese 101 or equivalent.

101–102 Cantonese Elementary Speaking 101, fall; 102, 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.

113–114 Cantonese Elementary Readings 113, fall; 114, spring. 3 credits each term. Prerequisite: permission of instructor. Both Chinese 112 and 114 or equivalents are necessary to fulfill any language requirements.

121–122 Intermediate Chinese I 121, fall; 122, spring. 4 credits each term. Prerequisite: qualification in Chinese.

131–132 Intermediate Chinese II 131, fall; 132, spring. 4 credits each term. Prerequisites: for Chinese 131, Chinese 302 or equivalent; for Chinese 302, Chinese 301.

Africana Studies and Research Center: Swahili
Asian Studies: Chinese, Japanese
Classics: Greek, Latin
German Literature: German
Near Eastern Studies: Akkadian, Arabic, Aramaic, Hebrew
Romance Studies: French, Italian, Portuguese, Spanish
Russian Literature: Russian

The Full-Year Asian Language Concentration (FALCON Program) offers intensive instruction in Chinese, Japanese, or Indonesian to students wishing to gain fluency in the language in a single year.

Arabic
213–214 Egyptian Arabic 213, fall; 214, spring. 3 credits each term.

See further listings under Near Eastern Studies.

Bengali
121–122 Elementary Bengali 121, fall; 122, spring. 4 credits each term. Prerequisite: for Bengali 122, Bengali 121 or examination.

Burmese
101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Burmese 102: Burmese 101 or equivalent.

Burmese Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Burmese 201, qualification in Burmese; for Burmese 202, Burmese 201.

Burmese Directed Individual Study 301, fall; 302, spring. 4 credits each term. Prerequisites: for Burmese 301, Burmese 202 or permission of instructor.

Cambodian (Khmer)
101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Cambodian 102: Cambodian 101 or equivalent. Sec, M–F: 8; lec to be arranged. F. E. Huffman.

Cambodian Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Cambodian 201, qualification in Cambodian; for Cambodian 202, Cambodian 201.

Cambodian Directed Individual Study 301, fall; 302, spring. 4 credits each term. Prerequisites: for Cambodian 301, Cambodian 202 or permission of instructor.

Cebuano (Bisayan)
101–102 Basic Course 101, fall; 102, spring. Offered according to demand. 6 credits each term. Prerequisite for Cebuano 102: Cebuano 101 or equivalent.

Chinese
Language and Linguistics
101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Chinese 102: Chinese 101 or equivalent.
Hours to be arranged. Staff.

Introductory survey of modern dialects and their distinguishing characteristics.

411–412 Readings In Modern Chinese Fall; 412, spring. 4 credits each term. Prerequisite: Chinese 302.
MWF 1:25 or 3:35. P. N.

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. S-U grades only. 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; (parallels first 16 credits of instruction in regular program); 162, spring (parallels second 16 credits of instruction in regular program). Prerequisite: permission of instructor.

Staff.

Foreign language requirement: Proficiency is attained by passing 161.

Literature

213–214 Introduction to Classical Chinese 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 11:15. 214: hours to be arranged. Staff.

313 Chinese Philosophical Texts Fall or spring, on demand. 4 credits. Prerequisite: Chinese 214. T. L. Mei.
314 Classical Narrative Texts Spring. 4 credits. Prerequisite: Chinese 214.
E. M. Gunn.
420 'Tang and Sung Poetry Fall or spring, on demand. 4 credits. Prerequisite: permission of instructor. T. L. Mei.

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. T. L. Mei.

430 Readings in Folk Literature Fall or spring, on demand. 4 credits. Prerequisite: permission of instructor. J. McCoy.

Note: For complete descriptions of courses numbered 600 or above, consult the appropriate instructor.

609 Seminar in Chinese Folk Literature Fall or spring, according to demand. 4 credits. Prerequisite: permission of instructor. J. McCoy.

621–622 Advanced Directed Reading 621, fall; 622, spring. Credit to be arranged. Prerequisite: permission of instructor.
E. J. Gunn, J. McCoy; T. L. Mei.

Dutch

131–132 Reading Course Fall; 131, fall; 132, spring. 3 credits each term. Prerequisite: permission of instructor.

Hours to be arranged. F. van Coetsen.

Seminar in Dutch Linguistics (German 740)

English

Intensive English Program, see p. 217.

203 English as a Second Language Fall. 4 credits. Prerequisite: placement by the instructor. M T R F 9:05. M. Martin.

Intermediate spoken and written English, with emphasis on speaking, understanding, and reading.

204 English as a Second Language Spring. 4 credits. Prerequisite: English 203 or placement by the instructor. M T R F 9:05. M. Martin.

Designed for those who have completed English 203 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 gaining 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 and conference and presentation of information in various forms. Personal conferences supplement class work.

211–212 English as a Second Language 211, fall or spring; 212, spring. 3 credits each term. Prerequisite: placement by the instructor. 211: MWF 9:05, 11:15, 2:30; T R 2:30–4. M. Martin.

Advanced reading and writing, with emphasis on improving vocabulary 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 Fall; 215, fall; 216, spring. 3 credits each term. Not designed for students whose schooling has been mostly in English. Prerequisite for English 215: 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 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, and maturity of style. Individual conferences on papers supplement class work.

French

N. Furman, chairperson; J. Béreaud (director of undergraduate studies, 265 Goldwin Smith Hall, 256-6407), A. Berger, A. Jones, B. Hall, D. I. Grossweiler, R. Klein, P. Lewis, E. P. Morris, J. S. Noblitt, A. Seznec, S. Tarrow, L. R. Waugh

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. Béreaud, who will admit them to the major. After their admission students will choose an adviser from among the French faculty. Students interested in the linguistic 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 study.

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 by the passing of a special examination to be taken no later than the end of the junior year. A typical program will involve two semesters of language at the 200 level (to be taken before 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 300 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 101–103). These courses will include at least one course concerning the history 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 preparobvisions programs. Similarly, interdisciplinary work is strongly encouraged: students may elect to enroll their major with related courses in history, archaeology, Classics, comparative literature, English and American literature, anthropology, music, history of art, philosophy, government, linguistics, and other literatures and languages.

French majors may study in France for a semester or a year during their junior year under any of the several study-abroad plans that are recognized by the Department of Romance Studies and the Department of Modern Languages and Literatures and allow for the transfer of credit. The director of undergraduate studies has information about such plans.

**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 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 tutorial (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 that 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 E. Morris; 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:** 2 credits. Taught in French.
- **Spring:** 4 credits. Taught in French.

#### 201 Intermediate French

Fall. 3 credits. Prerequisite: qualification in French. Offered by the Department of Romance Studies. Taught in French.

#### 211 Intermediate French

Fall. 3 credits. Prerequisite: qualification in French. Taught by the Department of Romance Studies. Taught in French.

#### 310 Advanced Conversation

Fall or spring. 4 credits. Prerequisite: French 204 or 212 or placement by Cornell Advanced Standing Examination (CASE). Taught in French.

#### 311 Advanced Composition and Conversation

Fall or spring. 4 credits. Prerequisite: French 204 or placement by Cornell Advanced Standing Examination (CASE). Taught by the Department of Romance Studies.

#### 401 History of the French Language

Fall. 4 credits. Prerequisites: qualification in French and Linguistics 101, or permission of instructor. Taught in French.

#### 402 Applied Linguistics: French

Fall. 4 credits. Prerequisite: qualification in French.

#### 408 Linguistic Structure of French

Spring. 4 credits. Prerequisite: qualification in French and Linguistics 101, or permission of instructor. Taught by the Department of Romance Studies.

#### 501 Contemporary Theories of French Grammar

Fall. 4 credits. Prerequisite: permission of instructor. Taught by the Department of Romance Studies.

#### 602 Linguistic Structure of Old and Middle French

Spring. 4 credits. Taught by the Department of Romance Studies.

#### 700 Seminar in French Linguistics

Fall or spring. Taught by the Department of Romance Studies.

#### 105 Freshman Seminar: The French Novel

Fall. 3 credits. Taught by the Department of Romance Studies.

#### 107 Freshman Seminar: Readings in Modern Literature

Not offered 1985–86.
109 Freshman Seminar: Techniques of Interpretation: An Introduction to Semiotics (also Romance Studies 109) Fall or spring. 3 credits. Prerequisite: knowledge of 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. Three sections are taught entirely in French (MWF 9:05, 10:10, or TR 10:10); the others will use English, and as much French will be used as the language proficiency of the students may allow. Readings for all sections are the same and all in French. Papers may be written in French or in English.

Fall. MWF 9:05, 10:10, 12:20, or 1:25; or TR 8:40–9:55, 10:10–11:25, or 12:20–1:35. J. Bbreaud. J. St. G. Groszvogel, and 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 by such authors as Baudelaire, Mallarmé, Rabelais, Diderot, Beaumarchais, Sartre, Camus, and Beckett.

202 Studies in French Literature Fall or spring. 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. Three sections are taught entirely in French (MWF 9:05, 10:10, or TR 10:10); the others will use English, and as much French will be used as the language proficiency of the students may allow. Readings for all sections are the same and all in French. Papers may be written in French or in English.

Fall. MWF 9:05, 10:10, 12:20, or 1:25; or TR 8:40–9:55, 10:10–11:25, or 12:20–1:35. Spring. MWF 9:05, 10:15, 12:20, or 1:25; or TR 12:20–1:35. D. Groszvogel and staff.

Study is on the development of reading skills and, more generally, on cultural, sociological, and aesthetic implications of the texts. Reading will include works by such authors as Baudelaire, Mallarmé, Rabelais, Diderot, Beaumarchais, Sartre, Camus, and Beckett.

164 Arts and Sciences

201 Introduction to French Literature Fall or spring. 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. Three sections are taught entirely in French (MWF 9:05, 10:10, or TR 10:10); the others will use English, and as much French will be used as the language proficiency of the students may allow. Readings for all sections are the same and all in French. Papers may be written in French or in English.

Fall. MWF 9:05, 10:10, 12:20, or 1:25; or TR 8:40–9:55, 10:10–11:25, or 12:20–1:35. Spring. MWF 9:05, 10:15, 12:20, or 1:25; or TR 12:20–1:35. D. Groszvogel and 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 by such authors as Baudelaire, Mallarmé, Rabelais, Diderot, Beaumarchais, Sartre, Camus, and Beckett.

333 Contemporary French Thought Fall. 4 credits.

T R 1–2:15. R. Klein.

This course will offer an introduction to the thought of several of the major figures who are influential in contemporary French intellectual life. It aims to present a general survey of intellectual developments in France since the eve of May 1968 by devoting particular attention to the work of Claude Levi-Strauss, Roland Barthes, Jacques Derrida, Jacques Lacan, Michel Foucault, and Hélène Cixous. Students will be encouraged to do the reading in French, but English translations of all the principal works will be available.

334 The Novel as Masterwork Not offered 1985–86.


338 Six French Poets Fall. 4 credits.

T R 2:30–3:45. R. Klein.

This course will concentrate on the new "genres," the psychic adventure forces that informed the work of these six influential figures. Emphasis will be placed on the close reading and careful analysis of selected poems.

334 The Novel as Masterwork Not offered 1985–86.

348 French Feminisms (also Women's Studies 493) Spring. 4 credits.


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, Sartre, Camus, Buto, Queneau, Sarratue, Robbe-Grillet, Vian, and others.

399 The Roots of Modernism in France, 1898–1924 Not offered 1985–86.

404 Cogito Ergo Sum: Thought and Existence from Descartes to Sartre (also Comparative Literature 404 and Romance Studies 404) Spring. 4 credits.

F 2:30–4:25. W. Holdeheim, C. Arroyo.

The course will trace the development of the Cartesian cogito, as the founding principle of modern subjectivity in both philosophy and literature, through a reading of representative works from Descartes to Sartre. Readings will include Descartes, Kierkegaard, representative romantic and postromantic tales and autobiographical writings, Unamuno, Husserl, Heidegger, and Sartre.

419–420 Special Topics in French Literature Fall, fall; 420, spring. 2–4 credits each term. Prerequisite: permission of instructor.

Guided independent study of special topics.

424 Composition and Style Not offered 1985–86.

429–430 Honors Work in French 4 credits each term, with permission of the adviser. Open to juniors and seniors. Consult the director of the honors program. Professor E. Morris.

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.

Fall. MWF 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.


457 Rabelais Not offered 1985–86.

458 Montaigne Not offered 1985–86.

461 The Theater of Moliere Not offered 1985–86.

473 Diderot and the Enlightenment Fall. Not offered 1985–86.

485 Reading Workshop: The Short Story Not offered 1985–86.

487 Rimbaud and the Quest for Reading Spring. 4 credits. Taught in French.


Through the combined study of Rimbaud's text and its massive reception, this course will investigate the resistance that Rimbaud's work opposes to our reading practices. The failure of both "traditional" and "modern" criticism to deal with Rimbaud's literal adventure forces us to adopt Rimbaud's own gesture towards literature and to find "le lieu et la formule" of a new reading.

493 French Feminisms (also Women's Studies 493) Not offered 1985–86.

596 Colette: Can She Be a Subject of Masculine Discussion in 1985? Not offered 1985–86.
The narrative art of two great masters will be offered 1985-86.

Related Courses in Other Departments

Heidegger: Short Writings (Romance Studies 497)

Nietzsche and His French Reception (Comparative Literature 640)

Petrarach, Ronsard, Donne (Comparative Literature 458)

Germanic Studies


The German Major

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 minimum of six 300- and 400-level courses in addition to German 303-304. These courses should be representative selection of subjects in German literature, Germanic linguistics, or both. 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) shall represent the student's main area of interest.

A comparative analysis of French and English humor in the fictional writings of such authors as Gide, Queuennec, Proust, Huxley, Waugh, Amis, etc. Sociological and psychoanalytic assumptions will serve as the point of departure for the reading of these texts.

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.

Languages and Linguistics

121-122 Elementary Course 121, fall; 122, spring, 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 80 after German 121-122 attain qualification and may enter the 200-level sequence; otherwise German 123 is required for qualification.

123 Continuing German Fall or spring, 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.

204 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: qualification in German.

205 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 204 or equivalent. Prerequisite for German 304: German 303 or equivalent.

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.

204 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 203 or permission of instructor.

205 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 204 or permission of instructor.

206 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 205 or permission of instructor.

207 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 206 or permission of instructor.

208 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 207 or permission of instructor.

209 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 208 or permission of instructor.

210 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 209 or permission of instructor.

211 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 210 or permission of instructor.

212 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 211 or permission of instructor.

213 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 212 or permission of instructor.

214 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 213 or permission of instructor.

215 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 214 or permission of instructor.

216 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 215 or permission of instructor.

217 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 216 or permission of instructor.

218 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 217 or permission of instructor.

219 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 218 or permission of instructor.

220 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 219 or permission of instructor.

221 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 220 or permission of instructor.

222 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 221 or permission of instructor.

223 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 222 or permission of instructor.

224 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 223 or permission of instructor.

225 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 224 or permission of instructor.

226 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 225 or permission of instructor.

227 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 226 or permission of instructor.

228 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 227 or permission of instructor.

229 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 228 or permission of instructor.

230 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 229 or permission of instructor.

231 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 230 or permission of instructor.

232 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 231 or permission of instructor.

233 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 232 or permission of instructor.

234 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 233 or permission of instructor.

235 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 234 or permission of instructor.

236 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 235 or permission of instructor.

237 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 236 or permission of instructor.

238 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 237 or permission of instructor.

239 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 238 or permission of instructor.

240 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 239 or permission of instructor.

241 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 240 or permission of instructor.

242 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 241 or permission of instructor.

243 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 242 or permission of instructor.

244 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 243 or permission of instructor.

245 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 244 or permission of instructor.

246 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 245 or permission of instructor.

247 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 246 or permission of instructor.

248 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 247 or permission of instructor.

249 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 248 or permission of instructor.

250 Intermediate Composition and Conversation Fall or spring, 3 credits. Prerequisite: German 249 or permission of instructor.

251 Intermediate Composition and Conversation Fall or spring, 4 credits. Prerequisite: German 250 or permission of instructor.
166 Arts and Sciences

306 Zeitungsdutsch
Spring. 4 credits.
Prerequisite: German 304 or equivalent.
MWF 11:15. E. Augsberger.

[306 Introduction to Germanic Linguistics]
Fall. 4 credits.
Prerequisite: Linguistics 101 or permission of instructor. Offered alternate years. Not offered 1985–86.
Hours to be arranged. F. van Coetsem.
Survey of major issues in Germanic linguistics, with emphasis on historical and dialectal problems.

[302 History of the German Language]
Spring. 4 credits.
Prerequisite: German 204 and Linguistics 101 or permission of instructor. Offered alternate years.
Not offered 1985–86.
Hours to be arranged. F. van Coetsem.
The phonological, morphological, syntactic, and semantic developments from pre–Old High German times to the present.

[302 Modern German Phonology]
Fall. 4 credits.
Prerequisites: German 304 or equivalent, and Linguistics 101 or 301. Not offered 1985–86.
Hours to be arranged. F. van Coetsem.
The phonological system of German is viewed from various theoretical approaches.

[304 Modern German Syntax]
Spring. 4 credits.
Prerequisites: German 304 or equivalent, and Linguistics 101 or 301. Not offered 1985–86.
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.
Hours to be arranged. H. L. Kufner.
Survey of German dialects, the work done at the Sprachatlantis, and a discussion of modern approaches to dialectology.

[406 Runology]
Fall. 4 credits.
Prerequisite: German 401.
Not offered 1985–86.
Hours to be arranged. F. van Coetsem.
A study of the inscriptions in the older futhark and their relevance to historical Germanic linguistics.

[407 Applied Linguistics: German]
Fall. 4 credits.
MWF 9:05. H. L. Kufner.
Designed to equip the teacher of German with the ability to apply current linguistic theory to the second language learning situation.

[408 Linguistic Structure of German]
Spring. 4 credits.
Prerequisites: German 204 and Linguistics 101–102, or permission of instructor. Not offered 1985–86.
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. Not offered 1985–86.
Hours to be arranged. F. van Coetsem.

[604 Old Saxon, Old Frisian]
Spring. 4 credits.
Prerequisite: Linguistics 102. Offered alternate years.
Not offered 1985–86.
Hours to be arranged. F. van Coetsem.

605 Structure of Old English
Fall. 4 credits.
Prerequisite: German 401.
Hours to be arranged. W. E. Harbert.
Linguistic overview of Old English, with emphasis on phonology and syntax.

[606 Topics in Historical Germanic Phonology]
Fall. 4 credits.
Prerequisite: German 401. Not offered 1985–86.
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]
Spring. 4 credits.
Prerequisite: German 401. Not offered 1985–86.
Hours to be arranged. J. Jasanoff.
The Germanic verbal system and its Indo-European origins.

[608 Topics in Historical Germanic Syntax]
Fall. 4 credits.
Prerequisite: German 401. Not offered 1985–86.
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: 609, spring; 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 1985–86.
Hours to be arranged. J. Jasanoff.
Texts are chosen to suit the interests of the students taking the course but normally include selections from the more extensive Old High German and Old Saxon sources (Otfrid, 'Tatian, 'Hansell) as well as representative shorter works such as Hildebrandt's, Muspil, and Genesis.

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; 632, spring. 3 credits each term. Limited to graduate students.
Prerequisite for German 632: German 631 or equivalent.
MWF 4.30 or TR 1.25–2.40. I. Kowary.
Emphasis is on developing skill in reading, although some attention will be devoted to the spoken language, especially to listening comprehension.

710 Seminar in Germanic Linguistics
Fall or spring, subject to the needs of students and to the limitations of staff time. 4 credits.
Hours to be arranged. Staff.
Topics include phonology, morphology, syntax, and dialectology of the older Germanic languages.

[720 Seminar in Comparative Germanic Linguistics]
Fall or spring, subject to the needs of students and to the limitations of staff time. 4 credits.
Not offered 1985–86.
Hours to be arranged. Staff.
Selected topics including the history, structure, and dialects of Gothic and Old Saxon.

740 Seminar in Dutch Linguistics
Spring, subject to the needs of students and to the limitations of staff time. 4 credits.
Hours to be arranged. F. van Coetsem.
Selected topics including the history, structure, and dialects of modern Dutch.

Literature

Freshman Seminars

109 Folk Tales and Folk Poetry
Fall and spring. 3 credits each term.
MWF 8, 10:10, 11:15, or 12:20, or TR 8:40–9:55.
E. Zengersall 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.

151 Kafka, Hasse, Brecht, and Momm
Fall and spring. 3 credits each term.
T R 8:40–9:55. 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 (Demian, Soldathara, 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.

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.
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, Achinger, Bachmann, Musil, and Kafka.

202 Introduction to German Literature II
Fall. 3 credits each term.
Prerequisite: German 201 or permission of instructor. Taught in German.
An intermediate course designed to improve reading, writing, speaking, and listening skills in German. Fulfills both the language proficiency requirement and, followed by German 202, the humanities distribution requirement.

211 Intensive Workshop in Germanic Studies for Freshmen
Fall. 6 credits. Intended for entering freshmen with extensive training in the German language (CPT achievement score of 650 or comparable evidence; please consult instructor). Taught in German. Satisfies the language and distribution requirements or the Freshman Seminar requirement.
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.

305 Modern Germany
Fall. 4 credits.
Prerequisite: German 202 or equivalent. Taught in German.
Introduction to the history of postwar Germany; the
development of the two Germanys, 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 2-3:45. Staff. Designed primarily as a sequel to German 211. Emphasis is on German literature since 1900 (T. Mann, Heiss, Kafka, Brecht, Duerrenmatt, Peter Weiss, Heiden, Rilke, Benn, Celan). Supplementary reading from contemporary philosophy, psychology, sociology, and political theory.

354 Schiller Not offered 1985–86.

355 The Age of Goethe Not offered 1985–86.

356 Goethe’s Faust Not offered 1985–86.

357 Major Works of Goethe Not offered 1985–86.

358 Kleist Fall. 4 credits. Prerequisite: German 201–202 or permission of instructor. Taught in German. W 2:30–4:30. I. Ezergailis. Reading and analysis of selected dramas, novellas, and essays.

359 Fin de Siècle Vienna Not offered 1985–86.

360 Naturalism and Feminism Not offered 1985–86.

362 Modern German Literature II: Twentieth-Century Prose Not offered 1985–86.

363 Contemporary Literature Not offered 1985–86.

365 German Poetry of the Twentieth Century Spring. 4 credits. Prerequisite: German 201–202 or permission of instructor. M W F 10:10. L. Olschner. The seminar will focus on close readings of selected exemplary texts, George, Hofmannsthal, and especially Rilke will provide the foundations upon which aspects of tradition, modernism, avant-gardism, and hermeticism can be defined and differentiated. Expressionists, dada, surrealism, traditional and recent nature poetry, political 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 214, but with occasional meetings devoted to discussion of individual texts. (Also see Music 374.)

Courses in English Translation

283 Contemporary European Society and Politics (also History 283) Spring. 4 credits. Not offered 1985–86. Hours to be arranged. S. Tarrow, J. Weiss. An introduction to European societies, their development, and current dynamics. Topic for 1984–85: the formation of Europeans. Education, community, and culture in Western Europe, with an emphasis upon how concepts of identity, community, class, and culture are acquired by young Europeans and developed in the worlds of family, school, work, and politics. The course is designed for students with an interest in, or experience of, various European countries, who wish to increase their knowledge of Western Europe. There are no formal prerequisites.


This course is designed for students with an interest in, or experience of, various European countries, who wish to increase their knowledge of Western Europe. There are no formal prerequisites. This course provides a general introduction to modern European society and politics. Focusing on Britain and the countries of northern Europe, we will explore the meaning of current events and issues from a historical perspective. Topics for fall 1985 include the legacy of colonialism, class culture and the role of organized labor, immigrant workers and ethnic minorities, problems of national identities; new social movements (e.g., the ‘Greens’ in West Germany), and European perceptions of the United States. The course will pursue these themes and others through films, newspaper articles, and literature as well as critical writings.

314 Nietzsche, the Man and the Artist Spring. 4 credits. Not offered 1985–86. T R 2:30–3:45. S. L. Gilman. An intensive reading of selections from Nietzsche’s poetry, letters, and philosophical writings: The Birth of Tragedy, The Gay Science, Thus Spoke Zarathustra, Beyond Good and Evil, Ecce Homo. His work will be read in the intellectual context of his time and will be interpreted both as his intellectual development and as a manifestation of his literary genius. In discussing the literary aspect of his work, close attention will be paid to Nietzsche’s poetic style.

320 Postwar German Novel Spring. 4 credits. T R 12:20–1:35. I. Ezergailis. A reading, in English translation, of such post-1945 German novels as Grass, Böll, Johnson, and Christa Wolf.

327 Health and Disease (also Biology and Society 327 and Psychology 387) Fall. 4 credits. Not offered 1985–86. M 1:25–3:25. S. L. Gilman and others. Everyone knows what health and disease are. Or do they? This Common Learning course on health and disease will explore some of the cultural, psychological, philosophical, anthropological, medical, economic, and political dimensions of these concepts 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 medicalization of certain specific diseases. The course will draw on specialists from throughout the University.

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. The course will conclude with the participation of the students in a major conference on ‘Anti-Semitism in Times of Conflict,’ to be held in the late spring.

350 Yiddish Literature in English Translation Not offered 1985–86.

377 Topics in Yiddish Literature Not offered 1985–86.

381 Marxist Cultural Theory (also Comparative Literature 291) Fall. 2:30–3:45. 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: medium, and final. M W F 12:20; screening T 4:30. D. Bathrick. The goal of the course is to explore the form and content 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, 1918–1933; Nazi film 1933–1945; Postwar film, 1945–present. Readings and lectures will be devoted to formal and cultural analysis of the history of German film as well as interpretative 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.

497 Heidegger: Short Writings (also Comparative Literature 497 and Romance Studies 497) Fall. 3 credits. Open to upper-division undergraduates and graduate students. R 2:30–4:25. C. M. Amoy. A study of Heidegger’s essays on language, poetry, science, and technology. Readings include The Origin of the Work of Art, “What are Poets for?,” The Age of the World Picture, “The Question Concerning Technology,” Letter on Humanism, and other writings on language and human existence. Aesthetic and literary ideas will be tested through the analysis of literary texts. The course will explore the possibilities and meaning of interdisciplinary knowledge on the basis of a “step back” (Schnitt zurück) to topics that are predisciplinary.

Graduate and Advanced Undergraduate Courses

405–406 Introduction to Medieval German Literature 405, fall; 406, spring. 4 credits each term. Prerequisites: For German 405, reading knowledge of German. For German 406, reading knowledge of German; for German 405 or equivalent. M W F 9:05. Fall: B. Buettner; spring: A. Groos. 405 will emphasize learning Middle High German in a literary context, using the Nibelungenlied and a romance of Hartmann von Aue. 406 will survey the classical period, emphasizing Wolfram von Eschenbach’s Parzival, Gottfried von Strassburg’s Tristan und Isolde, and major poets of the Minnesang, especially Walther von der Vogelweide. 405 will emphasize learning Middle High German in a literary context, using the Nibelungenlied and a romance of Hartmann von Aue. 406 will survey the classical period, emphasizing Wolfram 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 1985–86.


438 German Drama after 1945 Not offered 1985–86.

451–452 Independent Study 451, fall; 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 or above consult the appropriate instructor.

451 Seminar in Old Icelandic Literature I (also English 602) Not offered 1985–86.

452 Seminar in Old Icelandic Literature II (also English 612) Not offered 1985–86.
623 Seminar in Medieval German Literature (also Medieval Studies 601) Fall. 4 credits. W 1:25–3:25. A. Groos. Topic: Postclassical Middle High German literature.

[624 Seminar in Medieval German Literature II Not offered 1985–86.]

625 The Northern Renaissance and Reformation Not offered 1985–86]

627 Baroque Not offered 1985–86.]

629 The Enlightenment Fall. 4 credits. Prerequisite: permission of instructor. T 1:25–3:25. P. U. Hohnendahl.

632 The Age of Goethe Not offered 1985–86.]

635 Backgrounds of German Realism Not offered 1985–86.]

636 Nineteenth-Century Poetry Not offered 1985–86.]

637 Seminar in Realism: Die Novelle Not offered 1985–86.]

638 Contemporary German Women Writers Not offered 1985–86.]

639 Modern Lyric Poetry Not offered 1985–86.]

641 The Modern German Novel Not offered 1985–86.]


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.

[682 Seminar on Richard Wagner (also Music 678) Not offered 1985–86.]

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.

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, Kierkegaard, W. G. Sebald, B. A. Martin. Topic for fall: Rilke. Topic for spring: German women writers of the fin de siècle.

Related Courses in Other Departments

Fall

Comparative Literature 690 Marxism and Contemporary Theory

History 352 The End of the Austro-Hungarian Monarchy, 1848–1919

History 379 War and Society: The Origins of the First World War, 1870–1919

Spring

Comparative Literature 477 The Bildungsroman in Modern Literature

Government 341 Politics and Society in Central Europe

History 358 Survey of German History, 1890 to the Present

History 450 Seminar in European Imperialism

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.

M–F 10:10. G. Kelley. A semi-intensive course for beginners. Special attention will be given to the reading, speaking, and writing of modern Hindi and Urdu used in the fields of business, government, economics, etc., instead of literature.

201–202 Hindi Reading 201, fall; 202, spring. 3 credits each term. Prerequisite for Hindi 202: Hindi 201 or permission of instructor.

M W F 11:15. 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 201 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 202; for Hindi 302, Hindi 301 or equivalent.

Hours to be arranged. G. Kelley.

303–304 Advanced Composition and Conversation 303, fall; 304, spring. 4 credits each term. Prerequisites: for Hindi 303, Hindi 204 or equivalent; for Hindi 304, Hindi 303 or equivalent. Hours to be arranged. G. Kelley.

305–306 Advanced Hindi Readings 305, fall; 306, spring. 4 credits each term. Prerequisites: for Hindi 305, Hindi 202 or equivalent; for Hindi 306, Hindi 305 or equivalent. Hours to be arranged. G. Kelley.

Intended for those who wish to do readings in history, government, economics, etc.; instead of literature.

401 History of Hindi Fall or spring. 4 credits. Prerequisite: Hindi 101–102 or equivalent, or Linguistics 102.

425 History of Modern Hindi Fall or spring. 3 credits. Prerequisite: permission of instructor. Hours to be arranged. J. W. Gair and G. Kelley.

Hungarian

[131 Introduction to the Hungarian Language Fall. 3 credits. Offered alternate years. Not offered 1985–86. Hours to be arranged. E. W. Browne. Introduction to the basic structure of the Hungarian language (phonology, morphology, syntax). Work with native speaker.]

[132 Introduction to the Hungarian Language (Continued) Spring. 3 credits. Offered alternate years. Not offered 1985–86. Hours to be arranged. E. W. Browne. Syntactic structure of Hungarian and extensive reading. Work with native speaker.]

Indonesian

101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Indonesian 102: Indonesian 101. M–F 8, plus 2 hours to be arranged. J. U. Wolff. A semi-intensive course for beginners.

201–202 Indonesian Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Indonesian 201, qualification in Indonesian; for Indonesian 202, Indonesian 201 or permission of instructor.

Hours to be arranged. J. U. Wolff.

203–204 Composition and Conversation 203, fall; 204, spring. 3 credits each term. Prerequisite for Indonesian 204: Indonesian 203 or permission of instructor.

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. Hours to be arranged. J. U. Wolff.

303–304 Advanced Indonesian Conversation and Composition 303, fall; 304, spring. 4 credits each term. Prerequisites: for Indonesian 303, Indonesian 204; 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. Hours to be arranged. J. U. Wolff.
A practical language course on an advanced level in which the students will read materials in their own field of interest, write reports, and meet with the instructor for 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 302 or equivalent; for Indonesian 402, Indonesian 401 or equivalent. Hours to be arranged. J. U. Wolff and staff.

FALCON

161—162 Intensive Course 161, fall; 162, spring. 8 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) 401, fall; 402, spring. 4 credits each term. Prerequisites: for Italian 203, qualification in Italian; for Italian 204, 203 or equivalent. M W F 12:00, 1:25, or 2:30. M. Swenson. Guided conversation, composition, reading, pronunciation, and cultural review emphasizing the development of accurate and idiomatic expression in the language.

123 Continuing Italian Fall. 4 credits. Limited to students who have previously studied Italian and have 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. Lect. T 10:10, 12:20, or 2:30 drills, M W R F 8, 9:05, 10:10, 11:15, 12:20, 1:25, or 2:30. J. Scarpella, 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.

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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 Accelerated Introductory Japanese Fall 6 credits. Prerequisite: placement by the instructor during registration.
Lecs, MWF 10:10 (with Japanese 101); drills, MWF 12:20. Staff.
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.

301–302 Intermediate Japanese Reading II 301, fall; 302, spring, 4 credits each term. Prerequisites: 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, to be arranged. Staff.
Reading of selected modern texts with emphasis on expository style.

401–402 Advanced Japanese Reading 401, fall; 402, spring, 4 credits each term. Prerequisites: for Japanese 401, Japanese 302 or placement by the instructor during registration; for Japanese 402, Japanese 401 or placement by the instructor during registration.
MWF 2:30, to be arranged. Staff.
Reading of selected modern texts with emphasis on expository style.

541–542 Introductory Japanese for Business Purposes For graduate students only; undergraduates register for Japanese 141–142.
M–F 1:25.
For description see Japanese 141–142.

405 Introduction to Modern Literary Japanese Fall 4 credits. Prerequisite: Japanese 302 or permission of instructor.
B. deBary
Readings of selected works of modern Japanese literature.

399 Cinema to Literature Spring, 4 credits. 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. The films will be screened on Tuesdays and discussed on Thursdays.

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.

429–430 Honors in Italian Literature (also Italian 628) 429, fall; 430, spring, 4 credits each term.
Limited to seniors. Prerequisite: permission of instructor.

437 Petrarch: Canzoniere Not offered 1985–86.


488 Giacomo Leopardi and Modern Italian Poetry in the Nineteenth Century Not offered 1985–86.

496 Futurism in Italy and Europe Not offered 1985–86.

The course will focus on the highlights of a century of modern Italian poetry. Between its two best-known figures, opposed to each other in their poetry and politics, other poets weave their work in and out of the numerous "isms" of the time. Readings will include, in addition to selected works of D'Annunzio and Montale, those of Campana, Gozzano, Palazzeschi, Saba, Quasimodo, Ungaretti, and Zanzotto.

536 Narrative and Ideology in Contemporary Literature (also Italian 393 and Comparative Literature 393) Not offered 1985–86.

537 Vico and Gramsci and the Development of Modern Italian Thought (also Italian 394 and Comparative Literature 394) Not offered 1985–86.

639–640 Special Topics in Italian Literature 639, fall; 640, spring, 4 credits each term.
Staff.

656 Medieval Italian Lyric Not offered 1985–86.

Related Course in Another Department

Petrarch, Ronsard, Donne (Comparative Literature 458)

Japanese

Language and Linguistics

101–102 Elementary Course 101, fall; 102, spring, 6 credits each term. Prerequisite for Japanese 102: Japanese 101 or placement by the instructor during registration. Intended for beginners or for those who have been placed in the course by exam.
Lecs, MWF 10:10, drills, M–F 9:05, 11:15, 12:20, or 2:30. Staff.
A thorough grounding is given in all the language skills: listening, speaking, reading, and writing.

223 Transition to Intermediate Japanese Conversation Fall. 6 credits. Prerequisite: Japanese 160 (Cornell intensive summer course) or placement by the instructor during registration.
Lecs, MWF; hours to be arranged; drills, M T W R F; to be arranged. Staff.
Provides transition, primarily for summer course students, into regular program. After Japanese 223 the students will have covered same material that 203 students have covered. Japanese 223 satisfies prerequisite 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 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.)
Hours to be arranged. Staff.
Intermediate Japanese for students in international business and economics.
406 Introduction to Classical Japanese  Spring. 4 credits. Prerequisite: Japanese 405 or permission of instructor.
K. Brazell.
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 402 or equivalent; for Japanese 422, Japanese 421 or equivalent. Hours to be arranged. Staff. Topics are selected on 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 Intermediate 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. 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 in a non-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 540, or the history of a specific language or family
   e) 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
   f) 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 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 Harbert, 213 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 3.6 (A) 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.

100 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 12:00. 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 French, German, Italian, Russian, or Spanish. Weekly homework assignments; no prelims; no final examinations.

101–102 Theory and Practice of Linguistics  101, Fall; 102, spring. 4 credits each term. M.W.F 9:05; disc to be arranged. H. L. Kufner.

An introductory course designed to provide an overview of the science of language. Linguistics 101 plus any other course in linguistics or 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 1985–86. M.W.F 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.


An introductory sociolinguistics course on the speech of the Hispanic bilingual in the United States. Fall semester topics include the relationship between standard languages and dialects, ebonics, 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.


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.

201 Phonetics  Fall. 3 credits. T.R. 8:30–9:45. J. E. Grimes.

Introductory-level study of practical and theoretical aspects of phonetics; emphasis on identifying, producing, and transcribing speech sounds.

202 Instrumental Phonetics  Spring. 3 credits. Prerequisites: Linguistics 201. T.R. 8:30–9:45. J. E. Grimes.

Intermediate-level study of practical, experimental, and theoretical aspects of articulatory and acoustic phonetics.


TV images convey connotative and denotative 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 semantics (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 1985–86. 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. Not offered 1985–86. T R 2:30–3:45. J. S. Bowes. 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 mental performance, universal grammar and the modularity hypothesis, and language and cognition.]

300 Multilingual Societies and Cultural Policy Spring. 4 credits. T R 2:30–4. D. F. Soia. 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. 301, fall; 302, spring. 4 credits each term. Prerequisite for 302: Linguistics 301 or permission of instructor. T R 10:10–11:25. G. N. Clements. 301 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 principles of phonological acquisition.

303–304 Syntax I, II Spring. 303, fall; 304, spring. 4 credits each term. Prerequisite for 304: Linguistics 303 or permission of instructor. T R 10:10–11:25. M. Harwood. 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.

306 Functional Syntax Fall. 4 credits. Prerequisite: Linguistics 102 or permission of instructor. M W F 9:05. D. F. Solà. A general survey of syntactic theories that highlight grammatical function and reveal its role in discourse structure.

[308 Dialectology Spring. 4 credits. Offered alternate years. Not offered 1985–86. Hours to be arranged. Staff. Methods and procedures of dialectal study with introduction to the major dialectal attasises.]

[310 Morphology Fall. 4 credits. Prerequisite: Linguistics 101 or 111 or the equivalent. Not offered 1985–86. Hours to be arranged. Staff. A general survey focusing on the relationship of meaning and form in morphology.]

[311–312 The Structure of English 311, fall; 312, 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. Not offered 1985–86. 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. M W F 11:15, plus one hour to be arranged. M. Martin. A course in modern English for teachers of nonnative speakers of English. Methods and techniques used in the teaching of English language skills to nonnative 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 1985–86. T R 11–12:15. G. M. Messing.]


322 Comparative Romanic Linguistics Spring. 4 credits. Prerequisite: Linguistics 101 or equivalent, and qualification in any Romance language. Not offered 1985–86. Hours to be arranged. 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 dialectology.

325 Pragmatics Fall. 4 credits. Prerequisite: Linguistics 102 or permission of instructor. M W F 9:05. S. McConnell-Ginet. 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.

[402 Languages in Contact Fall. 4 credits. Prerequisite: Linguistics 101–102 or permission of instructor. Offered alternate years. Not offered 1985–86. M W F 9:05. H. L. Safflan. Examination of the variation of areas where languages exhibit interference phenomena: diglossia, bilingualism, dialects, second-language acquisition.]

[403 Introduction to Applied Linguistics Fall. 4 credits. Prerequisite: a course in the structure of a language at the 400 level. Not offered 1985–86. M W F 1:15. J. S. Noblett. Examination of the theoretical bases of applied linguistics, including second-language learning and current language-teaching methodologies.]

404 Comparative Methodology Fall. 4 credits. Prerequisite: Linguistics 101 or permission of instructor. Hours to be arranged. R. B. Jones. Exemplification of the methods of comparative reconstruction of proto-languages, using problems selected from a variety of language families; methods of evaluating reconstructions.

405 Sociolinguistics Fall. 4 credits. Prerequisite: Linguistics 101–102 or permission of instructor. Not offered 1985–86. Social influences (ethnic, socioeconomic, educational) on linguistic behavior, shifts in register, style, dialect, or language in different speech situations.

410 Introduction to Historical Linguistics Spring. 4 credits. Prerequisite: Linguistics 102 or permission of instructor. Hours to be arranged. A. Nussbaum. 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 1985–86. Hours to be arranged. G. Kelley. The function of language in society; social constraints on linguistic behavior, including taboo, jargons, registers, social and socially perceived dialects.]

417 History of the English Language Fall. 4 credits. Prerequisite: permission of instructor. M W F 9:15. G. Kelley. 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. M W F 2:30–3:45. G. Chiarelli. 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.

[436 Language Development (also Psychology 436 and Human Development and Family Studies 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. Not offered 1985–86. M W F 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 on. The acquisition of communication systems in nonhuman species such as chimpanzees is addressed, but major emphasis is on the child. The fundamental issue of relationships between language and cognition is also discussed.]

440 Semiotics and Language Spring. 4 credits. Prerequisites: some background in linguistics, philosophy, psychology, anthropology, or literary theory, or permission of instructor. Not offered 1985–86. 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, Peirce, Jakobson) and to language as a semiotic system.

451 Language Typology Fall. 4 credits. Prerequisite: Linguistics 101–102 or equivalent. M W F 10:10. J. Gair. 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 inventory 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.
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.

494 Honors Thesis Research Fall. 4 credits. Hours to be arranged. Staff. May be taken before or after Linguistics 494; or may be taken independently.

495 Honors Thesis Research Spring. 4 credits. Hours to be arranged. Staff. May be taken as a continuation of, or before, Linguistics 493.

600 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.

602 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 minorin in linguistics or majoring in the linguistics of specific languages. M W F 10:10 and M 3:35. Staff. 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.

603 History of Linguistics Fall. 4 credits. Not offered 1985–86. TR 1–2:15. G. M. Messing. The history of linguistics from early Greek and Sanskrit grammarians to the modern period.

607 Schools of Linguistics Fall. 4 credits. Prerequisites: Linguistics 102 or 602 and permission of instructor. Not offered 1985–86. Hours to be arranged. J. E. Grimes. Readings and descriptions of major contemporary schools of linguistic thought in the twentieth century.

608 Discourse Analysis Fall. 4 credits. Prerequisite: permission of instructor. T 2:30–4:30. J. E. Grimes. Linguistic theory applied to relationships beyond the sentence.

620 Area Topics in Romance Linguistics Spring. 4 credits. May be repeated for credit. Offered alternate years. Not offered 1985–86. Hours to be arranged. J. S. Noblit. Topic for 1985: reading and linguistic analysis of the Old Provencal text Flamenca.

621–622 Hittite 621, fall; 622, spring. 4 credits each term. Prerequisites: for Linguistics 621, permission of instructor; for Linguistics 622, Linguistics 621 or permission of instructor. Not offered 1985–86. Hours to be arranged. J. Jasanoff.

623–624 Old Irish 623, fall; 624, spring. 4 credits each term. Prerequisite for 624: 623 or permission of instructor. Not offered 1985–86. Hours to be arranged. J. Jasanoff.

625–626 Middle Welsh 625, fall; 626, spring. 4 credits each term. Prerequisite: for Linguistics 625, knowledge of one ancient or medieval European language or permission of instructor; for Linguistics 626, Linguistics 625 or equivalent. Hours to be arranged. L. Joseph.

627 Advanced Old Irish Spring. 3 credits. Prerequisite: one year of Old Irish. Hours to be arranged. L. Joseph. 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 grammar and interpretation.

630 Early Irish Poetry Spring. 4 credits. Prerequisite: one semester of Old Irish. Not offered 1985–86. Hours to be arranged. L. Joseph. Irish verse is remarkable for the complexity of its structure, the compression of its language, and the archaism of its subject matter. We will read legal, heroic, religious, praise, and nature poetry from the archaic, classical, and later medieval periods.

631 Comparative Indo-European Linguistics Fall. 4 credits. Prerequisite: permission of instructor. Not offered 1985–86. Hours to be arranged. J. Jasanoff.

640 Elementary Pali Fall or spring, according to demand. 3 credits. Hours to be arranged. J. W. Gair. An introduction to the comparative grammar of the Indo-European languages.

641–642 Elementary Sanskrit 641, fall; 642, spring. 3 credits each term. Prerequisite for Linguistics 642. Linguistics 641. Hours to be arranged. G. Messing.

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. R. B. Jones. 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 Malayo-Polynesian 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 Austronesian Linguistics 657, fall; 658, spring. 4 credits each term. Prerequisites: Linguistics 102 and permission of instructor. Not offered 1985–86. Hours to be arranged. F. E. Huffman. Descriptive and comparative studies of Austronesian 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 ancient 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.

751 Thai Dialectology Fall. 4 credits. Prerequisites: Linguistics 303 and permission of instructor. Hours to be arranged. R. B. Jones. Geographical distribution of the Thai languages and methods of classifying and subgrouping.

752 Comparative Thai Spring. 4 credits. Prerequisites: Linguistics 404 or equivalent, and permission of instructor. Hours to be arranged. R. B. Jones. Comparative reconstruction of Proto-Thai, including various points of view and criteria for subgrouping.

753 Tibeto-Burman Linguistics Fall. 4 credits. Prerequisites: Linguistics 404 or equivalent, and permission of instructor. Hours to be arranged. R. B. Jones. Comparative reconstruction of Tibeto-Burman, with emphasis on the Lolo-Burmese branch and historical study of Burmese.

Nepali

101–102 Elementary Nepali 102, 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 Nepal Conversation 201, fall; 202, spring. 3 credits each term. Prerequisites: for Nepali 101, 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 202 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. Not offered 1985–86. Hours to be arranged. E. W. Browne.]

133–134 Intermediate Course 133, fall; 134, spring. 3 credits each term. Prerequisites: for Polish 133, Polish 132 or equivalent; for Polish 134, Polish 133 or equivalent. 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.
133–134 Intermediate 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. Hours to be arranged. D. F. Sola. An introductory conversation and reading course. Study of the Huarochni manuscript.

403 Linguistic Structure of Quechua Fall. 4 credits. Hours to be arranged. D. F. Sola. 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. Sola.

Linguistics

321 History of the Romance Languages Fall. 4 credits. Prerequisite: Linguistics 101 or equivalent, and qualification in any Romance language. Not offered 1985–86. W R F 12:00. C. Rosen. For description see Linguistics 321.

323 Comparative Romance Linguistics Spring. 4 credits. Prerequisite: Linguistics 101 or equivalent, and qualification in any Romance language. Not offered 1985–86. Hours to be arranged. C. Rosen. For description see Linguistics 323.

620 Area Topics in Romance Linguistics Spring. 4 credits. May be repeated for credit. Offered alternate years. Not offered 1985–86. Hours to be arranged. J. S. Noblitt. For description see Linguistics 620.

621 Problems and Methods in Romance Linguistics Spring. 4 credits. Prerequisite: one syntax course and qualification in two Romance languages. Not offered 1985–86. Hours to be arranged. C. Rosen. Central topics in Romance syntax in the light of current theories of universal grammar.

622 Romance Dialectology Spring. 4 credits. Offered every third year. Not offered 1985–86. Hours to be arranged. C. Rosen. Diachronic and synchronic survey of dialects of the Romance language areas; 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. 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 begins with presupposed 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) Spring. 4 credits.

The course will trace the development of the Cartesian cogito as the founding principle of modern subjectivity in both philosophy and literature through a reading of representative works from Descartes to Sartre. Readings will include Descartes, Kierkegaard, representative romantic and postromantic tales and autobiographical writings, Unamuno, Husserl, Heidegger, and Sartre.

459 Being, God, Mind: Key Terms of Western Thought from Plato to Vico (also Comparative Literature 359) Not offered 1985–86.

460 Biology and Theology: Approaches to the Origin of Life, Evolution, Heritage and Freedom, Sexuality and Death (also Comparative Literature 460) Not offered 1985–86.

497 Heidegger: Short Writings (also Comparative Literature 497 and German 497) Fall. 3 credits. R 2:30–4:25. C. Arroyo. A reading of Heidegger's essays on language, poetry, science, and technology. Readings include "The origin of the work of art," "What are poets for?" "The age of the world picture," "The question concerning technology," Letter on Humanism, and other writings on language and human existence. Aesthetic and literary ideas will be tested through the analysis of literary texts. In general terms, the course will explore the possibilities and meaning of interdisciplinary knowledge on the basis of a "step back" (Schritt zuriick) to topics that are precritical. Intended audience: juniors and seniors with interest in the theory of humanistic and scientific knowledge.

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 Elementary Course II 133, fall; 134, spring. Offered according to demand. 3 credits. Prerequisite for Romanian 134: Romanian 133 or equivalent.

Russian

497 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 Senderovich 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 language. Certain courses may, with 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, which 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 qualifications but who do not wish to enter the 200-level sequence the following fall semester. Lect, 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 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. Lect, F 1:25, drills, M T W R 9:05, 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.

123 Continuing Russian Fall. 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. Lect, F 3:35, drills, M T W R 12:20 or 3:35. Staff.

A prequalification 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; 204, spring; 3 credits each term. Prerequisite: qualification in Russian. Prerequisite for Russian 204: Russian 203 or equivalent. Drills, M T R F 10:10, 11:15, or 2:30. Staff.

Guided conversation, composition, reading, pronunciation, and grammar review, emphasizing the development of accurate and idiomatic expression in the language.

Note: Students placed in the 200-level courses also have the option of taking courses in introductory literature. See separate listings under Russian 200, 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. Prerequisites: for Russian 303, Russian 204 or equivalent; for Russian 304, Russian 303–304 or equivalent; for Russian 306, Russian 305. T R 12:30. Staff.

This is a practical language course on an advanced level and is designed to improve oral control of colloquial Russian.


A synchronic study and analysis of Russian linguistic structure. Russian 403 deals primarily with phonology and morphology and 404 with syntax.


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 403 or permission of instructor; for Russian 406, Russian 405. Offered alternate years. Not offered 1985–86; next offered 1987–88. T R 2:30–4. L. H. Babby. This course is intended primarily to increase the student’s active 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. Not offered 1985–86. Hours to be arranged. R. L. Leed.

Application of linguistics to language teaching; teaching methods; comparative analysis of English and Russian; and practice teaching.

601 Old Church Slavic Fall. 4 credits. This course is prerequisite to Russian 602. Offered alternate years. Hours to be arranged. E. W. Browne.

Grammar and reading of basic texts.


Grammatical analysis and close reading of Old Russian texts.

633–634 Russian for Graduate Specialists 633, fall; 634, spring; 2 credits each term. Prerequisites: for Russian 633, 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. Hours to be arranged. E. W. Browne.

Sounds and forms of the Slavic languages and of prescientific 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. 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, whither 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 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 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 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 Freshman Seminar: Twentieth-Century Russian Literary Masterpieces Fall or 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 styly 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 persisted in collaborating on camps in the 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 dissident 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 12:20. Staff.

Why do we write or read? The centrality of reading and writing in our lives evidences our dependence on language. Both processes are means to 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 valorizations by 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. Offered to freshmen. Formal requirements: daily homework sheets, occasional quizzes on vocabulary with questions on the texts in Russian and English, a final exam, and one semester paper (10–12 pages) to be written in English on a topic of the student's choice.

300 The Soviet Union: Politics, Economics, and Culture (also Economics 330 and Government 330) Spring. 4 credits.

331 Russian Poetry Spring. 4 credits. Prerequisites: 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 1985–86.

334 The Russian Short Story Not offered 1985–86.

Gogol Not offered 1985–86.

350 Tolstoy and the Disciplines (also College Scholar 350) Not offered 1985–86.

367 The Russian Novel Spring. 4 credits. Also open to graduate students. There will be a special discussion section for students who read Russian.

Study of the major Russian prose writers of the nineteenth and twentieth centuries. Novels and short stories by Gogol, Turgeniev, Tolstoy, Dostoevsky, Chekhov, Solzhenitsyn, and others.

388 Soviet Literature Spring. 4 credits. Also open to graduate students. There will be a special section for students who read Russian.
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. Mayakovskii, Babel, Pasternak, Solzhenitsyn, and others. In English translation.

Dostoevsky (also Comparative Literature 338) 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 Brothers Karamazov will be read and discussed in terms of their literary qualities and their significance for the cultural history of Russia.

Chekhov Fall. 4 credits. A special section is offered for students who read Russian.
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.

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 Lermontov's Hero of Our Time. We will compare Hoffmann's bizarre premise 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.

388 Politics and the Novel (also Comparative Literature 388) Not offered 1985–86.

389 Modern Literature in Poland, Czechoslovakia, and Yugoslavia (also Comparative Literature 389) Not offered 1985–86.

W 2:30–4:30. G. Gibian and others.
The course will deal with various aspects of the general subject of national feeling. In addition to studying the political phenomenon of nationalism, we will also study the roles played by national awareness in the perception of one's identity, images of national character, stereotypes of national qualities, and the relation between a sense of belonging to a nation and various other groups. Case studies of various states.

400 Reading the Great Tradition 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.
T R 2:30–3:45. Staff.
The course is designed to improve the reading facility of advanced undergraduates and beginning graduate students by readers selected 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 disapproved, those in the Soviet Union and those in emigration, will be read.

416 Pedagogy and the Nineteenth-Century Novel (also Comparative Literature 418 and Society for the Humanities 418) Spring. 4 credits. Not offered 1985–86.
M 2:30–4:30, plus 1 hour to be arranged, P. Carden.
Platonic thought affiliates basic philosophical questions to pedagogy. How do we know? How do we learn? What education will produce worthy citizens and rulers? Rousseau in his Emile and Flaubert's Madame Bovary are two of the most significant psychological 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's Meno, Phaedo, Symposium, and Republic and as it is reintroduced 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 Flaubert's A Sentimental Education, to see how the premises 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.

431 Short Russian Prose Not offered 1985–86.

Pushkin Spring. 4 credits. Prerequisite: Russian 202 or equivalent, and permission of instructor. 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 for the Russian major. Not offered 1985–86.
T R 2:30–3:45. S. Senderovich.
Reading the original Russian language and discussion of selected works by Pushkin: lyrics, narrative poems, prose, plays, and Eugene Onegin.
Fall or spring. 1-4 credits each term. Prerequisite: permission of instructor.

To be arranged. Staff.

This course is to be taken in conjunction with any Russian literature course in English translation. Students will receive one credit for reading and discussing works in Russian in addition to their normal course work.


611 Supervised Reading and Research Fall or spring. 2–4 credits. Prerequisite: permission of the department. Hours to be arranged. Staff.


620 Twentieth-Century Russian Poetry Spring. 4 credits. Open to advanced undergraduates with permission of instructor. Taught in Russian. T 4–6. S. Senderovich. Selected topics.

[621] Russian Literature from the Beginnings to 1700 Not offered 1985–86.]


[623 Early Nineteenth-Century Literature Not offered 1985–86.]

624 Russian Romanticism Not offered 1985–86.]

625 Russian Realism Fall. 4 credits. Also open to advanced undergraduates with permission of instructor. R 3:35–5:35. P. Carden. 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 will 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 Lydya Ginzburg.

670 Bakhtin and the Russian Formalists (also Comparative Literature 670) Spring. 4 credits. Open to advanced undergraduates with permission of instructor. All readings in English. W 3:35. C. G. Emerson. The Russian literary theorist Mikhail Bakhtin has become, in the past several years, an important new presence in Western criticism. Bakhtin's work on Dostoevsky, Rabelais, Goethe, the history of the novel, and the philosophy of language has proved remarkably transferable into other cultures 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 Stavrovich neocommunistitsa and contemporary semioticians.

[671] Seminar in Russian Literature Fall. 4 credits. Open to advanced undergraduates: Not offered 1985–86.]

[672] Pasternak Not offered 1985–86.]

[701] Proseminar: Methods in Research and Criticism Not offered 1985–86.]

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

307–308 Themes from Russian Culture

330 The Soviet Union: Politics, Economics, and Culture

367 The Russian Novel

368 Soviet Literature

369 Dostoevsky

373 Chekhov

379 The Russian Connection

670 Bakhtin and the Russian Formalists

Courses in Russian

201–202 Readings in Russian Literature

331 Russian Poetry

393 Honors Essay Tutorial

400 Reading, the Great Tradition

491 Reading Course: Russian Literature in the Original Language

492 Supervised Reading in Russian Literature

611 Supervised Reading and Research

620 Studies in Modern Poetry

622 Eighteenth-Century Russian Literature

625 Russian Realism

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 Intermediate 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. Not offered 1985–86. 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 Santl, for literature (267 Goldwin Smith Hall), or Professor Sufier, for language and linguistics (218 Morrill Hall)—who will admit them to the major, and choose an advisor from the Spanish faculty of either the Department of Romance Studies or the Department of Modern Languages and Linguistics. Spanish majors will then work out a plan of study in consultation with their advisors. 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) See also 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 M. Sufier).
3) A combination of literature and linguistics.
4) Any of the above options with certain courses in other disciplines counted towards the major. Whichever option a student chooses, he or she is encouraged to enrich the major program by including a variety of courses from related fields or by combining Spanish with related fields such as history, philosophy, sociology, anthropology, art, music, Classics, English, comparative literature, and other foreign languages and literatures.

Spanish majors are encouraged to spend all or part of the junior year in a Spanish-speaking country. Students interested in the Study Abroad Program should consult with the Center for International Studies for further information. The J. G. White Prize and Scholarships are available annually to students who achieve excellence in Spanish.

Honors. 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).

Feeds. 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 560 after Spanish 121–122 attain qualification and may enter the 200-level sequence; otherwise Spanish 123 is required for qualification.

123 Continuing Spanish Fall or spring. 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.

203 Intermediate Composition and Conversation Fall or spring. 3 credits. Prerequisite: qualification in Spanish. Students placed in the 200-level courses have the option of taking language and/or literature courses; see list under Spanish 201 for description of the literature course that may be taken concurrently with the 203–204 or 211–212 language courses described below.

204 Intermediate Composition and Conversation Fall or spring. 3 credits. Prerequisite: Spanish 203 or permission of instructor.

211 Intermediate Spanish Fall. 3 credits. Prerequisite: qualification in Spanish. Equivalent in linguistic difficulty to Spanish 203. Completion of this course satisfies the college's language requirement. Taught in Spanish. Offered by the Department of Romance Studies. MWF 11:15. C. Arroyo and staff.

212 Intermediate Spanish Spring. 3 credits. Prerequisite: Spanish 203 or permission of instructor. Equivalent in linguistic difficulty to Spanish 204. Offered by the Department of Romance Studies. TM 10:10–11:25. J. Titter.

310 Advanced Conversation and Pronunciation Spring. 2 credits. Prerequisite: Spanish 204 or equivalent.

311 Advanced Composition and Conversation Fall. 4 credits. Prerequisite: Spanish 204 or 212, or equivalent. Offered by the Department of Romance Studies. MWF 11:15 or 12:20. M. Randel and staff.

312 Advanced Composition and Conversation Spring. 4 credits. Continuation of Spanish 311 but may be taken separately Required of Spanish majors. Offered by the Department of Romance Studies. MWF 10:10 or 1:25. M. Randel and staff.

401 History of the Spanish Language Spring. 4 credits. Prerequisite: Linguistics 101 and qualification in Spanish, or permission of the instructor. MWF 9:05. Staff.

402 Linguistic Structure of Ibero-Romance Survey of dialects of Latin America and the Caribbean. Fall or spring, according to demand. 4 credits. Not offered 1985–86. Hours to be arranged. Staff.

407 Applied Linguistics: Spanish Analytical study of the language, including a variety of courses from related fields or treatment of specific problems in grammar, exposition writing, and readings in contemporary prose.
texts by authors such as Borges, Cortázar, Fuentes, García Márquez, García Lorca, and Cela are considered.

313 Spanish Civilization: Spain after Franco Spring. 4 credits. Taught in Spanish.
TR 12:20-1:35. C. Arroyo.
A study of the present situation of Spain and its historical background since the Civil War (1936-39). The socialist government and its problems and accomplishments in politics, economies, and culture. The transition from the Franco period and the role of King Juan Carlos since 1975. Historical background of the transition: liberal thought and economic and social trends.

317 Readings in Spanish-American Literature Spring. 4 credits.
MWF 11:15. J. Kronik, or TR 12:20-1:35, E. Santí.
Readings and discussion of representative texts from Spain from the romance period to the present: Bécquer, Galdós, Unamuno, García Lorca, Cela, and others.

323 Readings in Latin American Civilization Fall. 4 credits.
MWF 10:10. E. Santí.
The first half of the course will examine the chronological development of Latin American society, its culture, and institutions; the second half will be devoted to oral presentations and in-depth discussion of topics of contemporary interest that students will have chosen and researched (for example, the political and economic crisis in Central America, Caribbean literature, Mexican revolution, etc.). The final paper will be based on that presentation. Note: The prerequisite for the following courses, unless otherwise indicated, is Spanish 315, 316, or 317 or permission of instructor.

332 The Modern Drama in Spanish America Not offered 1985-86.

333 The Spanish-American Short Story Not offered 1985-86.

345 The Contemporary Spanish-American Novel Spring. 4 credits.
Reading and discussion of selected works of narrative fiction by today's leading authors: Cabrera Infante, Cortázar, Donoso, Fuentes, García Márquez, Vargas Llosa, and others.

346 Hispanic Caribbean Culture and Literature Spring. 4 credits. Not offered 1985-86.

351 Spanish Drama of the Golden Age Not offered 1985-86.

355 Cervantes: Don Quijote Not offered 1985-86.


369 Archetypes of Spanish Literature Spring. 4 credits.
A study of the great heroes and antiheroes of Spanish classical literature: the bawd (Celestina), the picaro (Lazarillo), Don Quixote, Don Juan, and Segismundo (La vida es sueno). Readings and discussion will consider the emergence of these figures in the Spanish golden age and their subsequent transformation into archetypal characters in the Hispanic and Western traditions.

375 The Picaresque Novel in European Perspective Not offered 1985-86.

376 The Contemporary Spanish Novel Not offered 1985-86.

389 The Generation of 1898 Not offered 1985-86.

391 The Post-Civil War Drama in Spain Not offered 1985-86.

393 The Reader in the Novel (also Comparative Literature 393) Fall. 4 credits.
Devoted to an examination of the image of the reader and the act of reading as themes in classic and contemporary texts and the implications for our own reading experience. Works in translation by Cervantes, Fielding, Diderot, Nabokov, and others.

395 The Novel in Spain after the Civil War Not offered 1985-86.

399 Novel Into Film: The Modern Spanish Narrative Spring. 4 credits.
MWF 1-25, plus film showings to be arranged. J. Kronik, K. Vernon.
A study of narrative form as expressed through the written medium of fiction and the images of film. The focus will be on Spanish novels that have been made into films, including works by Galdós, Unamuno, Cela, Delibes, and others. Readings and class discussions will be supplemented by film viewings. Films by Burbete, Saura, and others.

419-420 Special Topics in Hispanic Literature 419, fall; 420, spring. 2-4 credits each term. Prerequisite: permission of instructor.
Staff
Guided independent study of specific topics. For undergraduates interested in special problems not covered in courses.

429-430 Honors Work in Hispanic Literature 429, fall; 430, spring. 4 credits each term. Limited to seniors. Prerequisite: permission of instructor.
Staff

469 Mystics and Moralists Not offered 1985-86.

479 Colonial Spanish-American Literature Not offered 1985-86.

481 Eighteenth- and Nineteenth-Century Spanish Drama Not offered 1985-86.

485 The Nineteenth-Century Spanish Novel: Goldós and Clarín Fall. 4 credits.
T 2:30-4:25. J. Kronik.
The course will focus on the two major novels of Spanish realism, Clarín’s La Regenta and Goldós’s Fortunata y Jacinta. Class discussion will consider their social dimensions, their narrative techniques, and the critical approaches they invite. Open to both graduates and undergraduates, with extra readings for graduates.

489 Hispanic Romanticism Not offered 1985-86.

493 Contemporary Spanish America: Historical Origin and Culture (also Society for the Humanities 418) Spring. 4 credits. Taught in English.
W 2:30-4:15. C. Fuentes.
Many things happening in the Latin-American world today began with the discovery, conquest, and colonization of the New World. By studying the founding and the presence of the West in the New World, as well as the assimilation and deformation of European values in the Americas, we will address both the thematic question of the encounter between the West and other societies and the more contemporary question of contextual interpretation of contemporary events. Readings include such early texts of the Renaissance and of the invention of the New World as Bernal Diaz’s Conquest of New Spain, Maquiaveli’s The Prince, Erasmus’s The Praise of Folly, and Thomas More’s Utopia. Discussion of such topics as revolution, models of development, Latin America’s position in the international community, the development of a Latin American contribution to international law, the persistence of “two nations” in each Latin-American republic, and the obstacles to change in light of the founding events, cultural traditions, and intellectual disturbances of the continent.

496 The Work of Carlos Fuentes (also Spanish 696 and Comparative Literature 484) Spring. 4 credits. Conducted in English.
This course, for both undergraduates and graduates, is designed to coincide with the visit to Cornell of Carlos Fuentes. It will cover his novels, theater, and criticism, from a variety of perspectives. Readings in English or Spanish.

498 Cuban Poetry Fall. 4 credits.
Consult the Department of Romance Studies.

499 Borges (also Comparative Literature 499) Fall. 4 credits.
A detailed reading of Borges’s stories, essays, and poems, with particular attention to his standing in world literature, his affinities with other modern literary figures (Kafka, Nabokov), and his favorite themes: the tensions between literature and philosophy, theory of fiction and violence. Readings and discussion in English. Knowledge of Spanish helpful but not essential.

639-640 Special Topics in Hispanic Literature 639, fall; 640, spring. 4 credits each term.
Staff.

667 Seminar in Golden Age Literature: Golden Age Poetry and Poetics Fall. 4 credits.
Intensive reading of major texts of sixteenth- and seventeenth-century Spanish poetry (Garcilaso, Herrera, Lope de Vega, Góngora, Quevedo). The seminar will seek to situate these works in the context of a contemporary critical and theoretical dialogue that grew out of poetry and in turn contributed to it. We will examine golden age concepts of genre, rhetoric, imitation, and reading, attending both to theories of poetic language and to the language of these theories.

696 The Work of Carlos Fuentes (also Spanish 496 and Comparative Literature 494) Spring. 4 credits.
See Spanish 496 for description.

Swahili
See Africana Studies and Research Center.

Tagalog
101-102 Elementary Course 101, 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.
[311–132 Introduction to the Turkish Language] 131, fall; 132, spring. 3 credits each term. Offered alternate years. Not offered 1985–86. Hours to be arranged. L. H. Babiy.

Turkish

Ukrainian

[131–132 Elementary Course] 131, fall; 132, spring. 3 credits each term. Prerequisite for Ukrainian 132, Ukrainian 131 or equivalent. Not offered 1985–86. Hours to be arranged. E. W. Browne.

Vietnamese

101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Vietnamese 102, Vietnamese 101 or equivalent. Intended for beginners or students placed by examination.

M–F 9:05; to be arranged. F. E. Huffman.

201–202 Vietnamese Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Vietnamese 201, qualification in Vietnamese; for Vietnamese 202, Vietnamese 201.

Hours to be arranged. F. E. Huffman.

203–204 Composition and Conversation 203, fall; 204, spring. 3 credits each term. Prerequisites: for Vietnamese 203, qualification in Vietnamese; for Vietnamese 204, Vietnamese 203.

Hours to be arranged. F. E. Huffman.

301–302 Advanced Vietnamese 301, fall; 302, spring. 4 credits each term. Prerequisite: Vietnamese 201–202 or equivalent.

Hours to be arranged. F. E. Huffman.

401–402 Directed Individual Study 401, fall; 402, spring. 4 credits each term. Prerequisite: permission of instructor. Intended for advanced students.

Hours to be arranged. F. E. Huffman.

Yiddish

See listings under Near Eastern Studies.

Music

T. A. Sokel, chairman; M. Hatch, director of undergraduate studies (B-20 Lincoln Hall, 256-5049); W. Austin, M. Blumberg, L. Coral, S. Davinoy-Wynne, J. Hsu, K. Husa, S. Monosoff, E. Murray, R. Parker, D. R. M. Paterson, D. M. Randal, M. W. Stith, S. Stucky, J. Webster, N. Zaslav

Musical Performance and Concerts

Musical performance is an integral part of Cornell's cultural life and is an essential part of the undergraduate academic programs in music. The department encourages music making through its offerings in individual instruction and through musical organizations and ensembles, which are directed and trained 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
College Museum
Cornell Eighteenth-Century Orchestra
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 conditions 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 these concerts are free and open to the public. These 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 (256-4097), or to the director of undergraduate studies, Professor D. R. M. Paterson, 213 Lincoln Hall (256-3531).

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 eventual 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 from the director of undergraduate studies, Professor D. R. M. Paterson, 213 Lincoln Hall (256-3531), or from the chairman, Professor James Webster, 124 Lincoln Hall (256-3671). 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, at latest by the end of the sophomore year (the freshman year is preferable), with a final grade of C or better, including an average grade of C or better in all the musicianship components of Music 152 and failure of all courses must be drawn from the three-course sequence Music 381–383. Before entering Cornell, prerequisite is the successful completion of Music 152 and failure in the performance major. An Option II major is the Option II program are previous acceptance as an Option II 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 II 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.

Option II majors 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 eventual graduate or professional work in music.

Option I presupposes some musical background before entering Cornell. Prerequisites for admission to the major are the satisfactory completion of Music 152, at latest by the end of the sophomore year (the freshman year is preferable), with a final grade of C or better, including an average grade of C or better in all the musicianship components of Music 152 and failure of all courses must be drawn from the three-course sequence Music 381–383. Before entering Cornell, prerequisite is the successful completion of Music 152 and failure in the performance major. An Option II major is the Option II program are previous acceptance as an Option II 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 II 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.

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 from the director of undergraduate studies, Professor D. R. M. Paterson, 213 Lincoln Hall (256-3531), or from the chairman, Professor James Webster, 124 Lincoln Hall (256-3671). 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, at latest by the end of the sophomore year (the freshman year is preferable), with a final grade of C or better, including an average grade of C or better in all the musicianship components of Music 152 and failure of all courses must be drawn from the three-course sequence Music 381–383. Before entering Cornell, prerequisite is the successful completion of Music 152 and failure in the performance major. An Option II major is the Option II program are previous acceptance as an Option II 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 II 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.

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 from the director of undergraduate studies, Professor D. R. M. Paterson, 213 Lincoln Hall (256-3531), or from the chairman, Professor James Webster, 124 Lincoln Hall (256-3671). All students are expected to have chosen an adviser from among the department faculty at the time of application for major status.
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) 450 may be used to satisfy this requirement.
   b) 12 credits in a musical specialization that will allow them to demonstrate their total musical ability. The level of honors conferred will be based on the candidate's performance.
   c) completion of all the requirements for Option I, except as noted above.

Honors. The honors program in music is intended to provide special opportunities for motivated 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. When invited, the student will enroll in Music 401-402, with the chairperson of the honors committee as instructor. Candidates will be encouraged to formulate programs of study that will allow them to demonstrate their total musical ability. The level of honors conferred will be based on the range of the independent work in this program, of which the senior 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 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, libretti, and recordings from all periods; twentieth-century scores and recordings; and the large microfilm collection of Renaissance sources, both theoretical and musical. In addition, the Department of Rare Books, in Olin Library, houses a collection of early printed books on music and musical manuscripts.

Musical Instruments. The Verne S. Swan collection of about thirty musical instruments is especially rich in old stringed instruments. A small Challis harpsichord and clavichord are available for practice; a Dowd harpsichord and a Hubbard harpsichord, and replicas of a Stein fortepiano and a Grazi fortepiano are reserved for advanced students and concerts. Among the recital pianos available for use are Steinway and Mason & Hamlin concert grands and a Beethoven Imperial. There is an Aeolian-Skinner organ in Sage Chapel, a Schlicker organ at Barnes Hall, and a Helmuth Wolff Hamlin concert grands and a Boesendorfer Imperial.

111 Sound, Sense, and Ideas Fall or spring. 3 credits. Each section limited to 18 students. No prerequisites; students do not need to have studied music. May not be counted for the distribution requirement in the expressive arts.

Fall: M W F 10:10, C. Eisen; or M W F 11:15, P. Will. Spring: M W F 9:05, C. Eisen.

Ways of listening, thinking, talking, and writing about music. Non-Western and popular music are considered, as well as Western classical music. Student performances in class are welcome.

113 Opera Spring. 3 credits. Not offered 1985-86.

[Contemporary Music. Spring. 3 credits. Limited to 18 students. No prerequisites; students do not need to have studied music. May not be counted for the distribution requirement in the expressive arts. Not offered 1985-86.]

116 Music and the American Media Spring. 3 credits. Limited to 18 students. No prerequisites; students do not need to have studied music. May not be counted for the distribution requirement in the expressive arts.

M W F 11:15. P. Will.

Introductory Courses

101 The Art of Music Fall. 3 credits.

TR 11:15-11:45, 1-hour disc to be arranged. W. Austin and staff.

Emphasis, chiefly through study of phonograph records, designed to speed up the continuing development of various independent tastes. Each student chooses individually what to study from among diverse styles of music. Students help refine these choices through the term; everyone studies a few assigned works; especially J. S. Bach, Ludwig van Beethoven, and Béla Bartók, to provide a common focus for tracing and discussing historical continuities and changes. Diversions are represented in the lectures by live performances as well as recordings. The lectures are organized to survey melody, rhythms, chords, and musical forms, suggesting ways to study any music—beyond the course as well as within it.

103 Introduction to the Musicologies of the World Fall. 3 credits. No previous training in music is required.


A survey of folk, popular, and art music in several regions of the world. Topics include pitch, scale, rhythm, meter, timbre, and form in instrumental and vocal music. Remaining weeks are devoted to the material for study; labs present opportunities to begin performance on instruments from the regions covered, which in fall 1985 will be South and Southeast Asia.

105-106 Introduction to Music Theory 105, fall; 106, spring. 3 credits each term. Some familiarity with music is desirable. Prerequisite for Music 106: 105 with grade of B- or better. Music 106 is limited to 50 students.

M W F 9:05-9:55. 2 disc hours to be arranged. D. Randel.

An elementary, self-contained introduction to music theory, emphasizing fundamental musical techniques, theoretical concepts, and their application. Music 105: ear training; notation, pitch, meter, intervals, scales, triads; basic concepts of tonality; extensive listening to music in various styles; analysis of representative works of Bach, Mozart, Beethoven, and Debussy. Music 106: systematic introduction to counterpoint; original composition of four-part chorales or short keyboard pieces.

108 Bach to Debussy Spring. 3 credits.

Prerequisite: Music 105 or permission of instructor.

TR 9:05-9:55, 1-hour disc to be arranged. D. Randel.

A chronological review of the major works in the Western concert repertory in all genres, from works of Bach and Handel that embody the newly consolidated language of tonality to works of Mahler and Debussy that signal the beginning of new strategies for many composers of the twentieth century.

122 Elementary Musicanship Spring. 2 credits.

Limited to 8 students per section. Prerequisite: permission of instructor. May not be counted for distribution in the expressive arts.

Sec. 1, M W F 10:10-10:50; Sec. 2, M T R 3:30-4:20. Staff.

Designed primarily to prepare students who wish to enroll in Music 151 to meet its prerequisite in practical musicianship. Intensive drill in matching pitches, singing melodies, writing melodies, sight-reading, introduction to keyboard instrumentalists, and reading treble and bass clefs together. A final grade of B- in Music 122, with failure in no individual component, satisfies the prerequisite for Music 151.

Music Theory

151-152 Elementary Tonal Theory 151, fall; 152, spring. 5 credits each term. Prerequisite for Music 151: knowledge of the rudiments of music and some ability to perform demonstrated through proficiency tests given on the first two days of the term (registration is provisional, contingent on passing this test); or Music 122 with a grade of B- or better and failure in no individual component. Prerequisite for Music 152: 151 or equivalent. Intended for students expecting to major in music and other qualified students. Required for admission to the music major. Credit is not given to major in music, especially those intending to elect Option II, should if possible enroll in Music 151-152 during the freshman year.

M W F 9:05-9:55, 2 discs to be arranged. E. Murray and staff.

Detailed study of the fundamental elements of tonal music: rhythm, scales, intervals, triads; melodic movement, two-part counterpoint, harmonic progression in the choral style of J. S. Bach; and introduction to analysis of small forms. Drill in aural discrimination, sight singing, keyboard harmony, and elementary figured bass, rhythm, melodic, and harmonic dictation; and score reading.

245-246 Theory and Practice of Gamelan 245, fall; 246, spring. 2 credits each term. No previous knowledge of musical notation or performance experience necessary. Music 245 is not a prerequisite to 246.

M W F 12:00-12:50, R 7:30-9:30 p.m. plus 1 additional hour. M. Hatch.

Concentrated instruction in the repertories and practices of Indonesian gamelan traditions. Related aspects of culture—dance, literature, and oral poetry—will be studied in their influence on musical practices. Research into performance styles and the history of instruments.

251-252 Intermediate Tonal Theory 251, fall; 252, spring. 5 credits each term. Prerequisite for Music 251: 152 or the equivalent or a suitable level of performance on a proficiency test given by the department during orientation each fall term. Prerequisite for Music 252: 251.

M W F 10:10-10:50; disc to be arranged. D. R. M. Patterson; 252, S. Stucky.

Introduction to writing two- and three-part counterpoint in the style of J. S. Bach. Continuation of the study of harmony by composition and analysis, including seventh chords, secondary dominants, and chromatic harmonies.

Students are expected to write several pieces in eighteenth- and nineteenth-century styles and forms, such as two-part inventions and minuets scored for string quartet. Continuation of analysis of forms, with emphasis on large forms, e.g., sonata form.

Ear training, keyboard harmony, figured bass, sight singing, dictation, and score reading.

Advanced Tonal Theory Fall. 4 credits.

Prerequisite: Music 252 or equivalent.


Inventions, chromatic harmony, analysis of larger forms and nineteenth-century music, ear training, score reading, and advanced keyboard studies, including figured bass.
Introduction to the techniques of composers from 1900 to 1950, including expanded tonal resources, atonality, and new approaches to form and rhythm. Analysis of representative smaller works by Bartok, Hindemith, Schoenberg, Stravinsky, Webern, and some American composers. Writing assignments in various styles.

[451 Counterpoint Spring. 4 credits. Prerequisite: Music 351 or equivalent. Not offered 1985–86.]

[452 Form and Analysis Spring. 4 credits. Prerequisite: Music 351 or equivalent. Not offered 1985–86.]

[456 Orchestration Spring. 4 credits. Prerequisite: Music 252 or permission of instructor. Not offered 1985–86.]

[460 Electronic Music Composition Fall. 3 credits. Limited to 10 students. Prerequisites: Music 252 and permission of instructor. Not offered 1985–86.]

[462 Orchestral Conducting Fall. 2 credits. Prerequisite: Music 352. T 10:10–12:05, K. Husa. The fundamentals of score reading and conducting technique; study of orchestral scores from baroque, classical, romantic, and contemporary periods. Occasionally the class will visit rehearsals of Cornell musical organizations.]

[463 Choral Conducting Spring. 2 credits. Prerequisite: Music 252 or permission of instructor. Not offered 1985–86. F 2:30–4:10, T. A. Sokol.]

[464 Choral Style Spring. 2 credits. Prerequisite: Music 252 or permission of instructor. Not offered 1985–86. F 2:30–4:10, T. A. Sokol.]

Music History

218 Chopin, Chailkovski, Musorgskii Spring. 3 credits. Students may wish to register concurrently in Music 219. T R 11:15; disc to be arranged. W. W. Austin, G. Gibian, and staff. Chief works of the three composers, including symphonies, concertos, and operas, are studied through phonograph records. Piano music and chamber music are presented in live performance. The biographical, social, and intellectual contexts of the music are considered in relation to concerns of the present. Students' essays may deal with such concerns more than any technical aspect of the music, though techniques are not neglected.

219 Chopin, Chailkovski, Musorgskii Spring. 1 credit. Prerequisite: reading knowledge of Russian. Limited to students concurrently enrolled in Music 218. Seminar to be arranged. See description for Music 218.

[221 Popular Music Spring. 3 credits. No previous formal training in music is required. Not offered 1985–86.]

222 Jazz Spring. 3 credits. No previous formal training in music is required. M W F 11:15; 1 disc to be arranged. M. Hatch. Lectures will introduce various jazz styles and techniques from around 1900 to the 1970s. Sections will present progressive exercises in analysis of fundamental aspects of jazz, including rhythm, meter, melody, harmony, timbre, and form. Focus: the recorded anthology Smithsonian Collection of Classical Jazz.

247 Opera Fall. 3 credits. M W 12:20. A. Groos, R. Parker. 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. (See also Music 374 and German Literature 374.)

[277 Baroque Instrumental Music Fall. 3 credits. Prerequisite: any 3- or 4-credit course in music, or permission of instructor. Not offered 1985–86.]

281 Music of the Baroque Period Fall or spring. every third semester. 3 credits. Prerequisite: any 3- or 4-credit course in music, or permission of instructor. Spring 1986: M W 1:25, N. Zaslav. The history of music from the rise of opera and instrumental art-music in the seventeenth century through the culmination of baroque style in the first half of the eighteenth. Emphasis on music of Monteverdi, Schütz, Purcell, J. S. Bach, and Handel.

[282 Music of the Classical Period Fall or spring, every third semester. 3 credits. Prerequisite: any course in music, or permission of instructor. M W 1:25, J. Webster. Not offered 1985–86.]

283 Music of the Romantic Era Fall or spring, every third semester. 3 credits. Prerequisite: any 3- or 4-credit course in music, or permission of instructor. Fall 1985: M W 1:25, R. Parker. The history of music from Schubert to Mahler, with a preliminary consideration of Beethoven. The course will concentrate on major figures and the following genres: solo song, piano music, chamber music, orchestral music, and opera.

369 Debussy to the Present Fall. 4 credits. Prerequisite: Music 152 or permission of instructor. M W F 11:15, W. Austin. S. Stucky. Study of selected pieces illustrating the diversity of twentieth-century musical techniques and purposes, the connections among composers through several generations; the unpredictability of their stylistic developments, and the freedom of students to develop their own connected interpretations of history. Techniques of composition and analysis (see Music 352, 654, 669, 670) are subordinated in this course to critical biography in social perspectives. Composers considered will include Copland, Cage, Crumb, Reich, and Dylan, as well as many Europeans.

[373 Music and Poetry in France: Late Middle Ages and Renaissance (also French 617) 4 credits. Not offered 1985–86.]

374 Opera Fall. 4 credits. Prerequisite: Music 152 or equivalent. M W 12:20, plus 1 disc to be arranged. A. Groos, R. Parker. The same as Music 274, but with one additional meeting each week devoted to technical discussion of individual works.

[377 Mozart: His Life, Works, and Times (also German 387) 4 credits. Not offered 1985–86.]

381 Music of the Baroque Period Fall or spring, every third semester. 4 credits. Prerequisite: Music 152 or equivalent. Spring 1986: M 1:25, W 1:25–3:20, N. Zaslav. The same as Music 281, but with an additional hour each week devoted to technical discussion of individual works.

[382 Music of the Classical Period Fall or spring, every third semester. 4 credits. Prerequisite: Music 152 or equivalent. Not offered 1985–86. M 1:25, W 1:25–3:20, J. Webster.]

383 Music of the Romantic Era Fall or spring, every third semester. 4 credits. Prerequisite: Music 152 or equivalent. M W 1:25, W 1:25–3:20, R. Parker. The same as Music 283, but with an additional hour each week devoted to technical discussion of individual works.

[389 The Study of Non-Western Musics 4 credits. Prerequisite: Music 152 or permission of instructor. Not offered 1985–86. M. Hatch.]


[481 Music in Western Europe to Josquin des Pre to Josquin des Pre to Monteverdi Spring. 4 credits. Prerequisite: Music 381, 382, or 363, or permission of instructor. Not offered 1985–86. T R 10:10–11:25, D. Randel.]

482 Josquin des Pre to Monteverdi Spring. 2 credits. Prerequisite: Music 381, 382, or 363, or permission of instructor. T R 10:10–11:25, N. Zaslav. A survey of the music of the high Renaissance and the later sixteenth century, concentrating on the major composers and the principal styles and genres.

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 strictly 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-rooms 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-half-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 321–322, 331–332, 333 through 338, 391–392, or 441 through 445); 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 $135. Practice-rooms fees for twelve hours weekly are $33 per term for a room with a piano; $10 for a room without a piano; $6750 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.

### 321–322a Individual Instruction in Voice
- **321a:** fall; 322a, spring. 2 credits each term. Hours to be arranged. S. Davenwy Wyner.
- **321b:** fall; 322b, spring. 2 credits each term. Hours to be arranged. D. R. M. Paterson.
- **321c:** fall; 322c, spring. 1–2 credits each term. Hours to be arranged. M. Bilson and staff.
- **334a:** fall; 334b, spring. 1 credit. Prerequisite: permission of instructor. Hours to be arranged. B. Adams.
- **335–336 Cornell Orchestra**
  - 335: fall; 336, spring. 1 credit. Prerequisite: permission of instructor. Rehearsals for the Cornell Symphony Orchestra: W 7:30–10 p.m. E. Murray.

### 337–338 University Bands
- **337:** fall; 338, spring. 1 credit. Symphonic band: fall or spring. T and W 4:30–5:45. Wind ensemble: fall. M 7:30–9:30 p.m.; spring. M 7:30–9:30 p.m. and R 4:30–5:45. M. Stith. Students interested in participating in the Big Red Marching Band may inquire at the Department of Athletics, Teagle Hall.

### 441–442 Chamber Music Ensemble
- **441:** fall; 442, spring. 1 credit. Study and performance of chamber music literature; string and wind groups; piano trios and quartets, trio sonatas, etc. Emphasis on musical problems, with some practice in sight reading.

### 443–444 Chamber Singers
- **443:** fall; 444, spring. 1 credit. Study and performance of selected vocal music for small choir.

### 445–446 Cornell Gamelan Ensemble
- **445:** fall; 446, spring. 1 credit. Study of representative contemporary works. Scoring and instrumentation.

### 447–448 Collegium Musicum
- **447:** fall; 448, spring. 1 credit. Study of the operas of Rameau.

### 180–181 Advanced Individual Instruction
- **180:** fall; 181, spring. 1 credit each term. Hours to be arranged. D. Stoffel.

### 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 toward the cost of lessons; $135 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.
- **392:** fall; 392, spring. 4 credits each term. Hours to be arranged. S. Monosoff.

### 393–394 Advanced Individual Instruction
- **393:** fall; 394, 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 toward the cost of lessons; $135 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.

### Musical Organizations and Ensembles

Students may participate in musical organizations and ensembles 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 prior 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 credits in these courses. Membership in these musical organizations and ensembles is also open to qualified students who wish to participate without earning credit.

### 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

#### 603 Editorial Practice (also Music 685)
- Fall. 4 credits. T 2:30–4:25. N. Zaslaw.


#### 623 Topics in Twentieth-Century Theory and Analysis
- Spring. 4 credits. Not offered 1985–86.

#### 653 Modern Orchestration
- Fall. 4 credits. Not offered 1985–86.

#### 675 Topics in Baroque Music
- Fall. 4 credits. Not offered 1985–86.

#### 680 Topics in 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 1985–86.

#### 683–684 Seminar in Renaissance Music
- Fall. 4 credits. Not offered 1985–86.

#### 690 Topics in Baroque Music (685: also Music 603)
- Fall. 4 credits each term. Not offered 1985–86.

#### 693 Topics in Music and Poetry in France: Late Middle Ages and Renaissance (also Music 337 and French 417)
- Fall. 4 credits. Not offered 1985–86.

#### 697 Mozarts: His Life, Works, and Times (also German 757)
- Fall. 4 credits. Not offered 1985–86.

#### 698 Study of Javanese gamelan
- Fall. 4 credits. Open to graduate students in anthropology, linguistics, psychology, sociology, and other cognate fields with the permission of the instructor. Not offered 1985–86.

#### 700 Topics in Twentieth-Century Theory and Analysis
- Fall. 4 credits. Not offered 1985–86.

#### 701–702 Topics in Baroque Music
- Fall. 4 credits. Not offered 1985–86.

#### 703–704 Seminar in Baroque Music
- Fall. 4 credits each term. Not offered 1985–86.

#### 705–706 Seminar in Baroque Music
- Fall. 4 credits each term. Not offered 1985–86.

#### 707–708 Seminar in Baroque Music
- Fall. 4 credits each term. Not offered 1985–86.

#### 709–710 Seminar in Baroque Music
- Fall. 4 credits each term. Not offered 1985–86.

#### 711–712 Seminar in Baroque Music
- Fall. 4 credits. Not offered 1985–86.

#### 713 Seminar in Baroque Music
- Fall. 4 credits each term. Not offered 1985–86.

#### 714 Seminar in Baroque Music
- Fall. 4 credits each term. Not offered 1985–86.

#### 715 Seminar in Baroque Music
- Fall. 4 credits each term. Not offered 1985–86.

#### 716 Seminar in Baroque Music
- Fall. 4 credits each term. Not offered 1985–86.

#### 717 Seminar in Baroque Music
- Fall. 4 credits. Not offered 1985–86.

#### 718 Seminar in Baroque Music
- Fall. 4 credits. Not offered 1985–86.
Study abroad. There are many opportunities for study in the Near East. Cornell has agreements with the University of Haifa, 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 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 Elat Study Center of the Kibbutz Movement in Tel Aviv. Application deadline is April 15, 1986. 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 499, in the first 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. After consulting their 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, philology, 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

126 Society, Economy, and Religion in Ancient Israel: King David's Jerusalem
Fall. 3 credits.
M W F 11:15. 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 of the Old Testament and historical books. Topics include occupations, institutions, contemporary literature, and various other domestic and administrative features of Israelite society.

154 Harems, Houris, and Hashish: Western Perceptions of the Middle East
Spring. 3 credits.

Societies acquire their identities, in part, by defining themselves against foreign, strangers, aliens, or enemies; we divide the world into the familiar (Europe, the West, “us”) and the strange (the Orient, the East, “them”). In this course we will explore how contemporary Western perceptions of the Middle East have been shaped by the imperial and colonial experience of the past 150 years, paying special attention to the role of power and politics in the production of culture and knowledge.

Language Courses

101–102 Elementary Modern Hebrew I and II
Fall. 101, fall; 102, spring. 6 credits each term. Prerequisite for NES 102: 101 or permission of instructor. Satisfactory completion of NES 102 fulfills the qualification portion of the language requirement.

111–112 Elementary Arabic
Fall. 111, fall; 112, spring. 6 credits each term. Not offered 1986—87.

121–122 Elementary Classical Hebrew
Fall. 121, fall; 122, spring. 4 credits each term. Prerequisite for NES 122: 121 or equivalent with permission of instructor. M W F 12:20, plus fourth hour to be arranged. M. Amihai Collins.

131–132 Introduction to the Turkish Language (also Turkish 131–132)
Fall. 131, fall; 132, spring. 3 credits each term. Not offered 1985—86.

171–172 Elementary Yiddish
Fall. 171, fall; 172, spring. 4 credits each term. Not offered 1985—86.

201–202 Intermediate Modern Hebrew I and II
Fall. 201, fall; 202, spring. 3 credits each term. Prerequisites for NES 201, 101 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 W F 12:20. N. Scharf.

Second-year modern Hebrew. Continued development of reading, writing, composition, listening, and speaking skills.

211–212 Intermediate Arabic
Fall. 211, fall; 212, spring. 3 credits each term. Prerequisites: for NES 211, one year of Arabic or permission of instructor; for NES 212, 211 or permission of instructor. TR 12:20, and W to be announced. Fall. D. Powers; spring. S. Mehrez.

The basic structures of literary Arabic are reviewed and reinforced. An appreciation for syntax is developed through readings in classical and modern texts.

213–214 Egyptian Arabic (also Arabic 213–214)
Fall. 213, fall; 214, spring. 4 credits each term. 213: no prerequisite. Prerequisite for NES 214: 213 or permission of instructor. All texts in Roman alphabet. TR 10:10. W to be arranged. S. Mehrez.

This course focuses on developing conversational abilities. Classes are supplemented with audiosales material. The students learn the basic structure of Egyptian spoken Arabic. Students are required to spend one to two hours per week in the language lab with sessions monitored by the instructor.

221 Readings in Classical Hebrew Literature: The Art of Biblical Narrative
Fall. 3 credits. Prerequisite: one year of Hebrew, modern or biblical.

For description see under literature

222 Reading in Classical Hebrew Literature
Spring. 3 credits. Not offered 1985—86.

238 Aramaic
Spring. 3 credits. Not offered 1985—86.

301–302 Advanced Modern Hebrew I and II
Fall. 301, fall; 302, spring. 4 credits each term. Not offered 1985—86.

311 Advanced Arabic
Fall. 4 credits. Not offered 1985—86.
Job to the liturgical poets

wine poetry, as well as mystical texts.

more recent periods in both the Near East and Western
discussed. Parallels will be drawn with developments in
development of trade routes will be evaluated and
and manufactured goods and their relationship to the

on the study of international treaties, economic sources,
A seminar on the dynamics of international trade based

4 credits.

204 Masterpieces of Jewish Literature I (also
Comparative Literature 204) Spring. 4 credits. No
prerequisites. Open to freshmen.

A reading of the major works of Hebrew literature from the
Bible to the Middle Ages in English translation, as well as
selections from Jewish biblical and postbiblical
literature in other languages such as Greek and
Aramaic. This course combines historical, literary, and
comparative perspectives on readings in various
genres of prose and poetry from the Book of Genesis to
Rabbinic Midrash and the Talmud, and from the Book of
Job to the liturgical poets (p'ayyamin). All readings are
in English translation. Students have the option of
reading the texts in the original languages.

205 Masterpieces of Jewish Literature (also
Comparative Literature 205) Spring. 4 credits. Not
offered 1985–86.

207 Modern Hebrew Literature in Translation:
The Poetry of Yehuda Amichai Fall. 3 credits. Open
to freshmen. Not offered 1985–86.

208 Modern Hebrew Literature in Translation
Spring. 3 credits. Open to freshmen. Not offered 1985–
86.

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.

Intensive reading of selected narrative prose texts.
Emphasis on fluency in reading and translating with
special attention to Hebrew style and expression,
lectures on language structures employed in
storytelling, and discussions of the stories as literature.
This course provides the basis for the analysis of
narrative art throughout the history of Hebrew literature.

222 Readings in Classical Hebrew Literature:
The Art of Biblical Poetry Spring. 3 credits. Not
offered 1985–86.

225 Judaic Literature in Late Antiquity: Dead
Sea Scrolls and Sectarian Literature Spring.
3 credits. Not offered 1985–86.

251 The Modern Arabic Novel Spring. 3 credits.
Not offered 1985–86.

254 Society, Politics, and the Modern Arabic
Novel Fall. 3 credits. Not offered 1985–86.

256 Modern Arabic Literature: The Short Story
Spring. 3 credits.
M W F 11:15. S. Mehrez.

Analysis of representative modern Arabic short stories.

291 Women in Jewish Literature: Tradition and
the Literary Imagination (also Women's Studies
Spring. 3 credits. Open to freshmen. Not offered 1985–
86.

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.

This course features stories about women in the
Hebrew Bible. Through literary and feminist readings of
these texts we attempt to understand the portrayal of
women (characteristics and roles assigned by male
writers); the social reality represented (sex-gender and
tribal systems); the role of narrative in the promotion of
patricial, ethnocentric, and religious ideologies;
the transformation of descriptive literary features into
prescriptive behavioral norms for Jewish women; and
our relationship as readers to ancient traditions that we
have inherited. Topics include sexuality, godliness,
witchcraft, war, power, violence, rape, foreigners,
prostitutes; well-known figures include Lilith, Eve,
Rahab, Deborah, Delilah, the Witch of En-Dor, Tamar,
Jezebel, and Esther. All texts in English translation;
Hebrew texts optional.

297 Beyond the Stereotype: Images of Women in
the Middle East Spring. 3 credits.
TR 1:25 – 2:40. S. Mehrez.

We will be reading fictional works on women as well as
works of fiction on and by women in an attempt to
revalue certain stereotypic functions 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.

303 Seminar in Modern Hebrew Literature: The
Short Story Fall. 4 credits. Not offered 1985–86.

304 Seminar in Modern Hebrew Literature: The
Novel Spring. 4 credits. Not offered 1985–86.

322 Undergraduate Seminar in Biblical
Literature: Prophecy in Ancient Israel Spring.
4 credits. Not offered 1985–86.

332 Ancient Near Eastern Literature Spring.
4 credits. Not offered 1985–86.

342 Biblical Interpretation in Rabbinic Literature
Spring. 4 credits. Not offered 1985–86.

375 The Shetel in Modern Yiddish Fiction in
English Translation (also German Literature 375)
Fall. 4 credits. Not offered 1985–86.

377 Topics in Yiddish Literature (also German
Literature 377) Spring. 4 credits. Not offered
1985–86.

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

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
(Anthropology 110)

Early People (Archaeology 203)

Approaches to Archaeology (Archaeology 302)

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)

[The Ethnic Dimensions in Politics (Government
336) Not offered 1985–86.]

Politics of the Military (Government 349)

Comparative Revolutions (Government 350)
America in the World Economy (Government 354)

Theories of International Relations (Government 383)

[Contemporary American Foreign Policy (Government 385) Not offered 1985–86.]

Sociology of War and Peace (Sociology 310)

History

History of American Foreign Policy (History 314)

Survey of German History (History 358)

Russian History since 1800 (History 363)

[Church and State During the Middle Ages (History 367) Not offered 1985–86.]


[European Workers in Europe and America (Industrial and Labor Relations 381) Not offered 1985–86.]

Literature

Christianity and Judaism (Comparative Literature 326) Not offered 1985–86.

Literature of the Old Testament (Comparative Literature 328)


New Testament Seminar (Comparative Literature 426)

Seminar on Biblical Law (Comparative Literature 427)

[Difference (Comparative Literature 485) Not offered 1985–86.]

Management

The Environment of International Business in the Middle East (NBA 583)

Nepali

See Modern Languages, Literatures, and Linguistics.

Philosophy

C. A. C. Din, chairperson; R. N. Boyd, G. Fine,
H. Hodes, T. H. Irwin, N. Kretzmann, D. Lyons,
R. W. Miller, S. Shoemaker (director of undergraduate
studies), 221 Goldwin Smith Hall, 256-5000),
R. C. Stainaker, N. L. Sturgeon, M. Wachsbeg,
A. W. Wodm

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 enroll in the Freshman Seminar are invited to attend seminars in 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 course work in related subjects approved by their major advisers. Occasionally majors may serve as teaching or research aids, working with faculty members familiar with their work.

Honor.

A candidate for honors in philosophy must be a philosophy major with a B– or better for all work in the College and 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 Goldwin 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.


101 Introduction to Philosophy

Fall or spring.

Fall: T R 10:10, S. Shoemaker, MWF 9:05, C. N. Sturgeon. Readings in classical works of philosophy (such as those of Plato, Aquinas, Descartes, Hume, Mill, Russell) concerned with some of the 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 1985–86.]

201 Philosophical Problems

Fall. 4 credits. T R 12:30–1:25. C. Ginet.

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 1985–86.]

211 Ancient Philosophy

Fall. 4 credits. T R 12:30. 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 divine free will.

212 Modern Philosophy

Spring. 4 credits. T R 1–2:15. G. Fine.


213 Existentialism

Fall. 4 credits. T R 2:30. 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, Dostoyevsky, and Sartre.

214 Philosophical Issues in Christian Thought

Spring. 4 credits. T R 10:10. N. Kretzmann.

Philosophical issues concerning such characteristically Christian concepts as the Trinity, the incarnation, redemption, predestination, personal immortality, hell, and revelation and faith, as treated by philosophers and theologians from the beginnings of Christianity until the present. Readings from the first fifteen hundred years of Christian thought, supplemented by contemporary scholarly and critical literature.

215 Medieval Philosophy

Fall. 4 credits. T R 12:30. N. Kretzmann.

An introduction to medieval philosophy, concentrating on such topics as the relationship of faith and reason, the nature of truth, the existence of God, universals in knowledge and reality, and the freedom of the will in the writings of such philosophers as Augustine, Boethius, Anselm, Aquinas, Scotus, and Ockham. Some attention to the historical development of philosophy from the end of antiquity through the fourteenth century.

231 Introduction to Formal Logic

Fall or spring. 4 credits. Fall: MWF 11:15, H. Hodes; spring: MWF 10:10, C. Ginet.

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. MWF 1:25. T. H. Irwin.

Introduction to the philosophical study of major ethical questions. Are all values relative, or are there some objective values? Can ethics be a science? Is human nature inevitably selfish? Have we ever had any good reasons to care about the interests of other people? When, if ever, does the end justify the means? Why should we care about morality anyway? The course discusses these general theoretical issues and also...
practical moral problems, especially questions of life and death (e.g., war, abortion, euthanasia) and dilemmas about justice (e.g., equality of opportunity and reverse discrimination). Readings from classical ethical writers (e.g., Plato, Kierkegaard, Nietzsche, Sartre) and from contemporary sources.

Intermediate Courses

Some of these courses have prerequisites.

309 Plato Fall. 4 credits. Prerequisite: at least one previous course in philosophy.
T R 2:30. G. Fine.
A study of Plato's major dialogues, ranging from the early Socratic dialogues through the Republic and such later dialogues as the Theaetetus and Sophist. The focus of the course will be on metaphysics and epistemology, but some attention will also be paid to Plato's ethical theory, especially as it occurs in the Republic. Central topics to be considered include the following: the nature and limits of knowledge and of sense perception; the Theory of Forms; justice and happiness. No knowledge of Greek or of Greek philosophy is required or expected.

310 Aristotle Not offered 1985–86.]

311 Modern Rationalism Fall. 4 credits. P. Hoffman.

312 Modern Empiricism Fall. 4 credits. M W F 11:15. N. Sturgeon.
Locke, Berkeley, and Hume. Substance, causality, and necessity; meaning, the possibility of scientific and moral knowledge. Historical and critical emphasis, with some illustrations of influences on more recent empiricist theories.

314 Topics in Ancient Philosophy 4 credits. Not offered 1985–86.]

315 Special Topics in the History of Philosophy Not offered 1985–86.

316 Kant Spring. 4 credits. M W F 2:30. T. H. Irwin.
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 scientific law, determinism, and the possibility of free will; free will, reason, and the basis of morality.

317 Hegel 4 credits. Not offered 1985–86.]


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 sociology, 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, their implications for issues in moral philosophy, and their relevance to contemporary moral and political controversies concerning war, racism, nationalism, political repression, and social inequality.

331 Formal Logic Spring. 4 credits. Prerequisite: Philosophy 231 or equivalent.
T R 3:30. 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 formulation of elementary logic. Further topics will be covered if time permits.

332 Semantics Spring. 4 credits.
T R 10: H. Hodes.
Reference, quantification, propositional attitudes, and perhaps other topics on the semantics of formal and natural languages. Some background in logic is recommended.

341 Ethical Theory Fall. 4 credits. T R 2:20. D. Lyons.

342 Law, Society, and Morality(also Law 666) Spring. 4 credits.
M W F 2:30. D. Lyons.
An examination of theories about the nature of law, many of which emphasize its relation to morality: law as divine commands, commands of an earthly sovereign, the exercise of power by the state, a species of rule-governed social behavior, legal regulation, and the exercise of eminent domain; moral obligations to the poor and to future generations; and the exercise of power by individual judges. Readings from Aquinas, Bentham, Austin, Gray, Holmes, Hart, Dworkin, and others.


361 Modern Rationalism Fall. 4 credits. M W F 2:30. T. H. Irwin.
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 scientific law, determinism, and the possibility of free will; free will, reason, and the basis of morality.

A study of the major current theories of how hypotheses are tested in the natural and the social sciences, how events and laws are explained, what causation is, how probability affects scientific inference, 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, probabilistic analyses of testing, relativist accounts of the limits of scientific reasoning, counterfactual theories of causation, 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, Darwin's The Origin of Species (and Einstein's nonmetrical writings).

363 Philosophy of Science: Knowledge and Objectivity Fall. 4 credits.
M W F 9:30 a.m. R. Boyd.
An examination of central epistemological and metaphysical issues raised by scientific theorizing, the nature of evidence, scientific objectivity, the nature of theories, models and paradigms, and the character of scientific revolutions. Readings from Aquinas, Berkeley, Hume, and Descartes.

364 Philosophy and Mathematics Not offered 1985–86.

365 Philosophy of Mathematics Not offered 1985–86.

366 Philosophy of Science: Knowledge and Objectivity Fall. 4 credits.
M W F 9:30 a.m. R. Boyd.
An examination of central epistemological and metaphysical issues raised by scientific theorizing, the nature of evidence, scientific objectivity, the nature of theories, models and paradigms, and the character of scientific revolutions. Readings from Aquinas, Berkeley, Hume, and Descartes.

367 Philosophy of Mathematics Not offered 1985–86.

368 Social Theory Not offered 1985–86.

369 Philosophy of Science: Evidence and Explanation Spring. 4 credits. Students should have some prior background in philosophy, a natural science, or a social science. M W F 1:25. R. Miller.
A study of the major current theories of how hypotheses are tested in the natural and the social sciences, how events and laws are explained, what causation is, how probability affects scientific inference, 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, probabilistic analyses of testing, relativist accounts of the limits of scientific reasoning, counterfactual theories of causation, 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, Darwin's The Origin of Species (and Einstein's nonmetrical writings).

370 Ethics and Social Change Spring. 4 credits.
M W F 2:30. D. Lyons.
An examination of the conceptual framework in which ethical problems in biology and medicine are to be understood, debated, and solved. Problems include experimentation on living subjects; reproductive technologies (eugenics, population control); contraception; abortion; and induced suicide; the allocation of scarce medical resources; physician-patient relationships; and health care systems.
Advanced Courses and Seminars

These courses are offered primarily for majors and graduate students.

412 Medieval Philosophy 4 credits. Not offered 1985–86

Prerequisites: at least two previous courses in philosophy.

413 Plato and Aristotle Spring. 4 credits.

414 German Philosophy after Kant Fall. 4 credits.

612 Medieval Philosophy Spring. 4 credits.

614 German Philosophy after Kant Fall. 4 credits.

441 Contemporary Ethical Theory Spring. 4 credits.

442 Ethics and the Philosophy of Mind Spring. 4 credits.

444 Contemporary Legal Theory (also Law 710) 4 credits. Spring.

446 Topics in Social and Political Philosophy Not offered 1985–86

461 Metaphysics 4 credits. Not offered 1985–86

462 Theory of Knowledge Fall. 4 credits. T 2:30–4:25, R. Miller.

481 Problems in the Philosophy of Science Not offered 1985–86

490 Special Studies in Philosophy Fall or spring. 4 credits. Open only to honors students in their senior year.

604 Ethics and Value Theory Fall. 4 credits. M 3:45, R. Miller.

615 Theory of Knowledge Fall. 4 credits. W 3:45–5:40, G. C. Ginet.

622 Philosophy of Mind Fall. 4 credits. W 3:45–5:40, G. Ginet.

682 Philosophy of Social Science Not offered 1985–86

700 Informal Study Fall or spring. Credit to be arranged. To be taken by graduate students only in exceptional circumstances and by arrangement made by the student with his or her Special Committee and the faculty member who has agreed to direct the study.

Related Courses in Other Departments

The Plural Society Revisited (Asian Studies 607–608)

Nietzsche, the Man and the Artist (German Literature 314)

Understanding African Thought (Society for the Humanities 412)

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 Witterwull, 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, 116–217–218 (-315), 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 111 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 112–213–214–315 or 16–217–218–315 is recommended for engineers and physics majors.

Courses beyond the introductory level that might be of interest to nonmajors are Physics 315, Phenomena of Microphysics; Physics 330, Modern Experimental Optics, and Physics 360, Electronic Circuits.

Advanced placement and credit are offered as outlined in "Advanced Placement of Freshmen," or students may consult Professor Cotts, 522 Clark Hall. Transfer students requesting credit for physics courses taken at another college should consult the department office.

The Major

Various options permit the student to concentrate heavily on physics or to take less physics and pursue an accompanying constellation of courses in a related area. Those desiring a physics concentration as preparation for professional or graduate work should complete Physics 112–213–214 or 16–217–218, and, if possible, 315 by the end of the sophomore year. A basic preparation for a less intensive physics program may include Physics 112–213–214 or 207–208–214. In either case, it is necessary to complete a concurrent sequence of mathematics courses.

Mathematics 191–292–293–294 are usually recommended, except for students especially interested in continuing the study of mathematics, for whom Mathematics 111–221–222–222 (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
Courses

100–102 General Physics 101, fall; 102, spring (101–102 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 122. Includes more modern physics and less mathematical analysis than Physics 207–208 but more rigorous than Physics 201–206. (Students planning to major in a physical science should elect Physics 207–208 or 121–123–214.) A mostly self-paced, mastery-oriented tutoral format; students will be proctored at hours of their choice. Repeated tests on each unit are given until mastery is demonstrated. One opening lecture 7:30 p.m., R Aug. 29 or M Sept. 2 (fall); M Jan. 23 (spring). Basic principles treated quantitatively 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 (may also be offered during summer). 4 credits. Primarily for students who are not yet prepared for specific physics majors. Prerequisites: coregistration in Mathematics 192 (or 194 or 112) or substantial previous contact with introductory calculus, combined with coregistration in Mathematics 193 or 113. Lecs, MWF 10:10 or 12:20; 2 recs each week; one 2-hour lab alternate weeks. Evening exams: fall, Oct. 8, Oct. 29, Nov. 26; spring, Feb. 20, Mar. 13, Apr. 10, M Kit. Fall, K. Ford; spring, F Ambegaokar. Mechanics of particles: kinematics, dynamics, conservation laws, central force fields, periodic motion. Mechanics of many-particle systems: center of mass, rotational mechanics of a rigid body, static equilibrium. Introduction to thermodynamics. At the level of University Physics, part I, 6th edition, by Sears, Zemansky, and Young.

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. Corrective transfers between Physics 116 and Physics 112 are possible. Emphasis is directed upon what we hear, and some aspects of the design upon what we hear, and some aspects of the

201–202 Energy: An Introduction to Physics 201, fall; 202, 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. Lecs, MWF 2:30; disc, T 12:20 or T 2:30. Fall, R. Richard; spring, M. Gilchriese. The concept of energy and the principles that govern the conversion of one form of energy into another (the first and second laws of thermodynamics) are among the most fundamental and fruitful organizing principles in all of science. This course tracks this concept through a variety of areas of physics. Insights into the nature of scientific theories and applications to practical issues are both addressed. Emphasis is directed toward developing quantitative reasoning skills as well as knowledgeability about the subject matter. Text: Romer, Energy, an Introduction to Physics.

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.

Lecs, M W F 2:30; disc, W 3:30. 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.

Not offered 1985–86.

Lecs, M W F 2:30; R. Stilbee. Many features of the production, propagation, and perception of sound may be understood in terms of important concepts in physics. Topics covered will include the mechanism of tone production in musical instruments, the distinctions in tone quality among different instruments, the influence of concert-hall design upon what we hear, and some aspects of the mechanism of hearing.

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 2:30; disc to be arranged. V. Ambegaokar. An attempt to explain how and when natural scientists can cope rationally with chance. Starting from simple questions such as "If one flips a fair coin, does one necessarily get the same number of heads and tails in 100 flips as in 500 flips?" or "If one meets someone with the same birthday, is it likely, unlikely, or just incomprehensible, the course will attempt to reach an understanding of more subtle points: Why it is, for example, that in large systems likely events can become overwhelmingly likely. From these last considerations, it may be possible to introduce the interested student into one to the second law of thermodynamics, that putative bridge between C. P. Snow's two cultures, another physical theory, quantum mechanics, in which chance occurs—though in a somewhat mysterious way—may be touched on.

206 War and Peace in the Nuclear Age Spring. 4 credits. Intended for nonscientists; does not serve as a prerequisite to further science courses. Assumes no scientific background but will use high school mathematics. Not offered 1985–86.

Lecs, M W F 2:30; 1 rec each week. P. Stein. This course is intended for any student who wishes to understand the fundamental physical principles, types, and effects of nuclear weapons; existing and proposed arsenals and delivery systems; the evolution and present state of the nuclear military strategy of the nuclear powers; and the history of, and current issues in, nuclear arms-control negotiations. Additionally, the course will examine critically the important concepts involved in military strategy and arms control. Attention will also be given to the moral and ethical questions involved. Assignments emphasize development of quantitative reasoning skills as well as knowledgeability about technical aspects of the subject matter.

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 113) and at least one prerequisite in Mathematics 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. 10, Nov. 14; spring, Mar. 6, Apr. 10, Fall, M. Gilchriese; spring, P. Lepage.

Distribution Requirement

The requirement in physical sciences is met by any two general education courses from the following: Physics 110, 111, 112, 116, 117, 118, 190, 214–218 (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 from 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, 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 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.

Prerequisites are specified in physics course descriptions to illustrate the materials that students should have mastered. Students who wish to plan programs are strongly urged to consult the prerequisites ordering are urged to discuss their preparation and background with a physics adviser or with the instructors in the course. In many cases an appropriate individual program can be worked out without exact adherence to the stated prerequisites.
213 Physics II: Electricity and Magnetism Fall or spring (may also be offered during summer). 4 credits. Primarily for students of engineering and for prospective physics majors. Prerequisites: Physics 112 and coregistration with a 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.


214 Physics III: Optics, Waves, and Particles Fall or spring (may also be offered during 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. 3, Nov. 5, spring, Feb. 25, Apr. 17. Fall, staff; spring, R. Galik. Physics of wave phenomena, electromagnetic waves, interference and diffraction effects, optics, wave properties of particles, introduction to quantum physics.

217 Physics II: Electricity and Magnetism Fall or spring. 4 credits. Intended for students who have done very well in Physics 112 and 116 and in mathematics and who desire a more analytic treatment than that of Physics 213. Perspective physics majors are encouraged to select Physics 217. Prerequisites: approval of student's adviser and permission from the instructor. Placement quiz may be given early in the semester, permitting those students who find Physics 217 too abstract or analytical to transfer into Physics 214. Conditions governing enrollment are similar to those of Physics 217.

Lecs, T R 9:15; 1 rec; 1 three-hour lab alternate weeks. Evening exams may be scheduled. Staff. A more rigorous version of Physics 215, 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.

Lecs, T R 9:15; 1 rec; 1 three-hour lab alternate weeks. (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 or 310. Prerequisites may be scheduled. C. Franck; spring, staff.

A more rigorous version of Physics 214.

310 Intermediate Experimental Physics Fall or spring. 3 credits. Prerequisite: Physics 208 or 213. 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 Microwaves Fall or spring. 4 credits. Primarily for students of engineering and 'prospective physics majors. Prerequisites: Physics 214 and Mathematics 294.


Introduction to the physics of atoms, solids, nuclei, and elementary particles, including a 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 Eiseberg and Resnick.

318 Analytical Mechanics Fall, 4 credits. Prerequisites: Physics 206 or 214 plus one of Mathematics 421, 422, or 423, or permission of instructor. Primarily 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 11:5–1:15, W F 11:15, N. D. Mermin. Newtonian mechanics of particles and systems of particles, including rigid bodies; oscillating systems; gravitation and planetary motion; moving coordinate systems; Euler's equations; Lagrange'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. Primarily for physics majors concentrating in physics. Similar material is covered in Physics 432 at a less demanding analytical level.


326 Electromagnetic Waves and Physical Optics Spring. 4 credits. Prerequisite: Physics 325.

Lecs, T R 9:05; W 1:25. B. Gillette.

Electromagnetic field 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.


A practical laboratory course in basic and modern optics. Students spend two-thirds of the course experimenting with apparatus and 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.


360 Electronic Circuits (also Applied and Engineering Physics 363) Fall or spring. 4 credits. Prerequisite: Physics 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.

Lecs, M 2:30–4:25; labs, T R or W F 1:25–4:25. Fall, W. Ho; spring, H. Fleischmann.

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 their applications. Discrete devices (diodes, bipolar transistors, and field-effect transistors) are covered briefly. In digital circuits, some time is spent on combinational logic. This experience is then applied to problems in programming and interfacing a simple microcomputer.

400 Informal Advanced Laboratory Fall or spring; (may also be offered during summer). 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 318 and 325, or permission of instructor.


Selected topics in experimental concepts and techniques. About seventy different experiments are available in acoustics, solid state physics, surface physics, circuits, electronics and ions, magnetic resonance, X-rays, low temperature, solid state, cosmic rays, nuclear physics. The student performs three to six experiments, depending on difficulty, selected from a list of 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 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 physics.

Lecs, M W F 10:10 and F 1:25. Fall, staff; spring, R. Siemann.

433 statistical 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. At the level of electromagnetic, magnetostatic, boundary value problems, dielectric and magnetic fields. Maxwell's equations and 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.

Introduction to 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.
Behavior of high-energy particles and radiation; elementary particles; basic properties of nuclei; nuclear reactions; nucleon-nucleon; nuclear symmetries and conservation laws. At the level of Subatomic Physics, by Frauenfelder and Henley.

454 Introductory Solid-State Physics
Spring. 4 credits. Prerequisite: Physics 443 or Chemistry 793, or permission of instructor.
An introduction to modern solid-state physics, including lattice structure, lattice vibrations, thermal properties, electron theory of metals and semiconductors, magnetic properties, and superconductivity.

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 or spring. Variable credit.

506 Design of Electronic Circuitry
Spring. 3 credits.
M W 9:05 plus lab hours to be arranged. D. Hertlit.
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 or spring. 3 credits.
Lecs, M W F 9:05. R. Pohl 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 or spring. 1–3 credits. To be supervised by faculty member. Students must advise department course coordinator and 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 intensive in experimental work than is possible in Physics 510.

525 Physics of Black Holes, White Dwarfs, and Neutron Stars (also Astronomy 511, High-Energy Astrophysics)
Spring. 4 credits.
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. Pulsar 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.
Prerequisites: A good knowledge of mechanics at the level of the books of V. I. Arnol'd and J. S. Netherly, or familiarity with modern mathematics at the level of Mathematics 515–516.
Lecs, T R 10:10–12, R 2:30. E. Siglina.
Classical mechanics, with an introduction to dynamical systems, at the level of V. I. Arnol’d’s text. Mathematical Methods of Classical Mechanics. In addition to the standard treatments of Lagrangian methods and rotating systems, periodically forced systems are treated. Development will be such that least possible prerequisites are covered. Some discussion of averaging and Kolmogorov-Arnold-Moser theory will conclude the course. The necessary mathematics of manifolds and differential forms is developed in the course.

553–554 General Relativity (also Astronomy 509–510)
553, fall; 554, spring. 4 credits.
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 general covariance, 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 to cosmology and cosmology. Topics include relativistic stars, gravitational collapse and black holes, gravitational waves, cosmology.

561 Classical Electrodynamics
Fall. 3 credits.
Lecs, M W F 11:15. K. Gottfried.
Ensembles and partition functions; fluctuations; thermodynamic properties of ideal gases and crystals, Third Law; chemical equilibrium. Imperfect gases; correlation functions; liquids. Ideal quantum gases; Bose-Einstein condensation. Phase transitions, phase models and lattice gases. At the level of Classical Electrodynamics, by Jackson.

562 Statistical Mechanics (also Chemistry 796)
Spring. 4 credits. Primarily for graduate students.
Prerequisite: Chemistry 793 or equivalent.
Assemblies and partition functions; fluctuations; thermodynamic properties of ideal gases and crystals, Third Law; chemical equilibrium. Imperfect gases; correlation functions; liquids. Ideal quantum gases; Bose-Einstein condensation. Phase transitions-Phase models and lattice gases. At the level of Classical Electrodynamics, by Jackson.

572 Quantum Mechanics I
Fall or spring. 4 credits.
Lecs, fall, M W F 9:05, F 1:25. S. Leppage; 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.
Lecs, M W F 11:15. Discussion of various 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 Intermediate Quantum Mechanics, by Bethe and Jackiw.

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 510 and some prior exposure to solid-state physics, such as Physics 454.
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.
Concepts developed in Physics 635 are extended and applied in a survey of the following: equilibrium and nonequilibrium properties of real materials, localized states, magnetism, neutron and light scattering, phenomenological superconductivity, and other topics of current interest in condensed-matter physics.

645 High-Energy Particle Physics
Fall. 3 credits.
Lecs, M W F 11:15. D. Cassel.

646 High-Energy Particle Physics
Spring. 3 credits.
Topics of current interest, such as high-energy electron and neutrino 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.
Relativistic quantum mechanics with emphasis on perturbation techniques. Extensive applications to quantum electrodynamics. Introduction to renormalization theory. At a level somewhat above that of Relativistic Quantum Mechanics, by Bjorken and Drell.

652 Quantum Field Theory
Spring. 3 credits. S-U grades only.
Canonical field theory. Analytic property of scattering amplitudes and dispersion relations. Renormalization and renormalization group. Symmetry and spontaneous symmetry breaking. Gauge theories. At the level of Quantum Field Theory, by Itzykson and Zuber.

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 thermodynamics. S-U grades only.
Lecs, M W F 9:05. M. Nelkin.
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 superconductors; kinetic theory and the Boltzmann equation; statistical mechanics; phase transitions; scaling laws and phase transitions. The contents of the course vary with the current interests of the
The areas are very broadly defined, 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 linguistics. Personality and social psychology is represented by courses and fieldwork in psychotherapy as well as courses in social psychology and personality (such as theories of personality, beliefs and attitudes, and sex roles). 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 is recommended), and
2) demonstration of proficiency in statistics before the beginning of the senior year. (See the section below on the statistics requirement.)

Usually it is expected that all undergraduate psychology majors will take at least one course in each of the following 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.


Note: Course requirements for the biopsychology area and/or introductory biology among their prerequisites.

3) Social, personality, and abnormal psychology: Psychology 206, 275, 277, 278, 325, 327, 328, 379, 380, 381, 383, 384, 385, 402, 426, 457, 467, 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 or Psychology 471.
2) Passing an approved course or course sequence in statistics in some other department at Cornell. 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, university, 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 exemption 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 set 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 who will design their courses with the adviser on an integrated program in biopsychology built around courses in physiological, 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 concentration 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 those exceptionally able students who wish to pursue an intensive and somewhat independent program of research in psychology. Successful participation in this program serves as evidence of the student's facility in 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 research career in psychology or other academic fields should consider the honors program seriously. The program offers most students the closest contact and consultation with faculty that they will receive during their time at Cornell.
Students may enroll in the honors program either in the spring semester of their junior year or the fall semester of their senior year. The main focus of the program is the research project each student carries out in the senior year. Students must discuss their projects in the year before they apply to Senior Honors (Psychology 494), write a report of their research, and pass an oral defense of their thesis. Junior Honors (Psychology 494) serves as preparation for those activities. Students who are uncertain of the topic they wish to research or who have yet to find an appropriate faculty advisor for their project may spend the spring semester of their junior year reading about, formulating, and discussing possible research topics. The credit option involves a written report of the student's progress due at the end of the semester.

Students planning on enrolling in Junior Honors must apply in the fall semester of their junior year. Applicants must have a minimum grade-point average of 3.3 in all psychology courses to be admitted to the program. Students who choose to enroll in Junior Honors gain admission to Senior Honors on the basis of satisfactory performance in the junior honors seminar. Students applying to Senior Honors without having been in Junior Honors must apply for admission by the second week of the fall semester of their senior year. Such students must submit an application and letters of recommendation from two faculty members.

Final honors standing is indicated on the student's diploma. The T. A. Ryan award, accompanied by a small cash prize, is given to the student who completes the best honors project.

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, 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. 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.


The study of human behavior. Topics include brain functioning, sleep and dream, physiological and psychological testing, perception, learning, 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. Prerequisite: concurrent enrollment in Psychology 101. Hours to be arranged; 32 different time options. A weekly seminar that may be taken in addition to Psychology 101 to provide an in-depth exploration of selected areas in the field of psychology. Includes 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. E. Adkins Regan and staff.

A survey of behavior emphasizing evolutionary and physiological approaches, designed to introduce students to the basic concepts of brain and human behavior. Both human and nonhuman behavior are included, together with theoretical issues pertaining to the application of biological principles to human behavior.

190  Thought and Intelligence  

The concepts underlying the measurement of intelligence and the problems involved in interpreting such measures are considered in the context of psychological studies of problem solving and thinking. Topics include introspective accounts of thought, experiments on problem solving and concept formation, cross-cultural studies of thinking, the history of intelligence and the problems involved in interpreting intelligence and validity of tests, heritability of intelligence, and recent relevant research.

201  Introduction to Psychology as a Laboratory Science  
Fall. 3 credits. Prerequisite: one course in psychology (normally Psychology 101, 123, or 190). High school credit in psychology may meet this prerequisite with permission of instructor. Not offered 1985–86. Staff.

205  Perception  
Fall. 3 credits. Open to first-year students. M W F 9:05. J. Cutting.

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.

206  Psychology in Business and Industry (also Hotel Administration 314)  
Spring. 3 credits. Limited to 35 psychology students. Prerequisites: Psychology 101, 123, or 190, or permission of instructor. Not recommended for upperclass students in ILR. Not offered 1985–86. T 12:20, R 12:20–2. Staff.

The principles of psychology applied to industrial and business systems: selection, placement and training, problems of people at work, including evaluation, motivation, efficiency, and fatigue, and the social psychology of the work organization.

207  Motivation Theory: Contemporary Approaches and Applications  
Spring. 4 credits. Prerequisite: an introductory psychology course; Psychology 201 is recommended but not required. Not offered 1985–86. M W F 11:15. Staff.

Models and research in human motivation are examined and integrated. Theoretical approaches are used as departure points for the study of more current themes such as intrinsic motivation and achievement motivation. Attention is given to how pertinent themes are to real-life behavioral settings.

209  Developmental Psychology  
Spring. 3 or 4 credits. Prerequisite: an introductory psychology course. M 12:20–1:45; sec to be arranged. F. Keil.

A comprehensive introduction to current thinking and research in developmental psychology. Topics include perceptual and cognitive development in infancy and childhood, attachment, language development, Piagetian theory and research, moral development, cross-cultural perspectives, and socialization.

214  Introduction to Cognitive Psychology  
Spring. 3 credits. Prerequisite: one course in psychology. T R 10:10. C. Krumhansl.

An introduction to psychology, emphasizing the perceptual and cognitive processes that underlie human behavior. The course is designed to introduce the student to topics such as perception, memory, language, thinking, development, problem solving, and decision making, and provide a basis for investigating problems in these areas are discussed.

215  Language and Communication  
Fall. 3 or 4 credits. Prerequisite: one term of biology or psychology. Limited to 40 students. Open to first-year students. Not offered 1985–86. M W F 1:25. Staff.

Topics include the nature of language, its origin and acquisition, the relation between language structures and psychological processes; also animal communication; sign language; aphasia; black English, and reading.

275  Introduction to Personality Psychology  
Fall. 3 or 4 credits; the additional (or fourth) credit is given for attendance at the optional section meeting and a term paper. Prerequisite: an introductory psychology course.

T R 10:10 to 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 optional term paper. Prerequisite: an 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, esthetics. Evidence 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, equalitarian marriage relationships, gender-liberated child-rearing, female sexuality, homosexuality, and transsexuality.

280  Introduction to Social Psychology (also Sociology 280)  
Spring. 3 or 4 credits; the additional (or fourth) credit is given for the completion of a group research project and write-up. Prerequisite: an introductory psychology course.

T R 8:40–9:55. T. Giovovich and D. Regan.

An introduction to research and theory in social psychology. Topics include processing of social information; social influence, persuasion, and attitude change; social interaction and group phenomena. The application of social psychological knowledge to current events will also be discussed.

305  Visual Perception  
Spring. 3 or 4 credits, depending on whether the student elects to do an independent laboratory project or to enroll in an independent research project limited to 20 students. Prerequisite: Psychology 205 or permission of instructor. Not offered 1985–86. T R 10:10. 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.

307  Chemosensory Perception  
Fall. 3 or 4 credits; the optional (or fourth) credit is for an independent laboratory project; registration for the 4-credit option requires permission of the instructor; students will read, analyze, and discuss difficult original literature in the areas covered. Offered alternate years.

T R 9:05. B. P. Halpern.

An examination of basic theory, data, and processes for perception of the chemosensory environment. Topics include psychophysical and nonhuman studies, stimulus control, chemosensory function and development in neonates, role of chemosensory function in food choices, chemosensory communication, effects of pollution of the chemosensory environment, and possible consequences of chemosensory dysfunctions. At the level of The Perception of Odors, by T. Engen; Food Taste Chemistry, edited by J. C. Boudreau; and Clinical Measurement of Taste and Smell, edited by H. L. Meiselman and R. S. Rivlin.
Prerequisite: either Psychology 205, 209, or 305, or permission of instructor. Not offered 1985–86.

A critical examination of basic theories and empirical findings regarding visual perceptual development. Topics to be covered include the development of perception of objects, the spatial layout, events, pictures, and symbols. We will read, discuss, and critically analyze original experimental reports and theoretical articles. In our analysis we will try to determine what is the perceptual world of the young infant and growing child like? What specific perceptual abilities does the young infant already have, and what other abilities must be developed? Are there guiding principles of perceptual development, and if so, what are they? What implications does our understanding of perceptual development have for theories of adult perception?

The Psychology of Language Spring. 4 credits. Prerequisites: either Psychology 205, 214, 215, or 305, or permission of instructor. Not offered 1985–86.

TR 10:10–11:25. J. Freyd. Students not currently in a field placement who want to advance for this course. Students in Psychology 327 (for 3 credits in 325 and 2 credits in 327) with permission of instructor. Not be taken more than twice. Students do not enroll in 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 and 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 supervision and for academic credit. A limited number of students will be selected to begin their fieldwork with Psychology 328 but only with permission of the instructor.

Psychology 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.

TR 1:25–4:25. T. DeVugod. 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.

Evolution of Human Behavior Fall. 3 or 4 credits. Prerequisite: Psychology 123, an introductory biology course, or an introductory anthropology course.

Mind 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 evolutionary theories will be discussed and evaluated.

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 enroll 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.

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.

TR 10–11:30. E. Adjikin 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.

Biopsychotherapy 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.

TR 1:25–4:25. T. DeVugod. 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.

Evolution of Human Behavior Fall. 3 or 4 credits. Prerequisite: Psychology 123, an introductory biology course, or an introductory anthropology course.

Mind 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 evolutionary theories will be discussed and evaluated.

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 enroll 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.

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.

TR 10–11:30. E. Adjikin 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.

Biopsychotherapy 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.

TR 1:25–4:25. T. DeVugod. 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.

Evolution of Human Behavior Fall. 3 or 4 credits. Prerequisite: Psychology 123, an introductory biology course, or an introductory anthropology course.

Mind 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 evolutionary theories will be discussed and evaluated.

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 enroll 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.

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.

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Evolution of Human Behavior Fall. 3 or 4 credits. Prerequisite: Psychology 123, an introductory biology course, or an introductory anthropology course.

Mind 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 evolutionary theories will be discussed and evaluated.

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 enroll 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.

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.

TR 10–11:30. E. Adjikin 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.
380 Beliefs and Attitudes (also Sociology 380) Spring. 4 credits. Prerequisites: some familiarity with the topic of attitudes from prior courses, or permission of instructor. Not offered 1985–86.
An intermediate course in social psychology. Attitudes are viewed as emotionally charged beliefs that underlie ideologies, values, interpersonal feelings, and religion. 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 Azjen (how beliefs develop from information, how attitudes develop from beliefs, how these in turn lead to intention and behavior); (2) the balance theory of Fritz Heider and its several derivatives (how beliefs and attitudes form in harmony with our 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.)

381 Person Perception and Expression Spring. 4 credits. Prerequisite: one course in social psychology or personality, or one course in psychology and one course in sociology, or permission of instructor. Not offered 1985–86.
Hours to be arranged. Staff.
An intermediate course in social psychology, focusing on people's judgments of one another and on their attempts to manipulate how others judge them. Impressions, attributions, biases, self-concept, self-disclosure, self-presentation, deception, body language, conversational style, and facial expressions are relevant topics.

383 Social Interaction (also Sociology 383) Spring. 4 credits. Prerequisite: a course in social psychology or personality. M W 2:30–4:25. 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 Sociology 384) Spring. 4 credits. Prerequisite: a course in psychology and one in either sociology or social or cultural anthropology, or permission of instructor. M W F 11:15. W. W. Lambert.
A critical survey of approaches, methods, discoveries, and applications in the attempts to study human nature, experience, and behavior cross-culturally. Focus on studies of cognition, values, socialization, sociolinguistics, personality, attitudes, stereotype, ideology, societal development, and mental illness. Problems of how one can learn another culture will also be dealt with.

385 Theories of Personality (also Sociology 385) Fall 4 credits. Prerequisite: Psychology 101, 214, or 275, or permission of instructor. Not offered 1985–86.
T R 1–2. W. W. Lambert.
An intermediate analysis of comparative features of the historically and currently important theories of personality, with an evaluation of their systematic empirical contributions to modern personality study, to psychology, and to other behavioral sciences.

386 Issues in Black Personality Fall. 3 credits. Prerequisite: one course in introductory psychology or African Studies 171 or permission of instructor. Letter grades only. Limit of two juniors and seniors.
M W 12:00–1:35. G. McQuate.
Students in this senior seminar will review the psychological and educational literature on achievement, self-concept, locus of control, and delay of gratification as they pertain to Black populations. The IQ controversy and the Black family structure will also be discussed. The methods and frameworks utilized to study these critically important variables will be examined. Course requirements include active participation in class discussions, one midterm paper, and a final paper.

387 Health and Disease (also Biology and Society 327 and German Literature 327) Fall. 4 credits. Limited to 20 students. Not offered 1985–86. Hours to be arranged. S. L. Gilman and faculty team.
Even if you know what health and disease are. Or do they? This Common Learning course on health and disease will explore some of the cultural, psychological, philosophical, anthropological, medical, economic, and political dimensions of these concepts 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 disease and human nature; 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 credits with term paper). Registration for the 4-credit option requires permission of instructor. Prerequisite: an introductory course in biology or biopsychology, plus a second course in neurobiology or behavior. Perceptual or cognitive biology. 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.
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 literature dealing with both those characteristics of sensory systems which are common across living organisms and those sensory properties which represent adaptations of animals to particular habitats and environments. The particular 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. At the level of An Introduction to the Physiology of Hearing, 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. Fay; and "Information Processing in Cutaneous Mechanoreceptors," Fed. Proc., 42: 1983.

402 Current Research on Psychopathology Fall. 4 credits. Prerequisite: Psychology 325.
T R 12:20–2:15; sec to be arranged. K. Keil.
An advanced treatment of the nature of the human capacity for language. Topics include the nature of linguistic theory, syntax and semantics, aspects of language use, constructions, knowledge, thought and action, communication, and language acquisition.

418 Psychology of Music Spring. 3 or 4 credits, depending on whether student elects to do an independent project. Prerequisites: junior or senior music major; psychology majors with backgrounds in literature or music and some background in both, or permission of instructor. Not offered 1985–86.
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.

420 Human Factors Spring. 4 credits. Prerequisite: Psychology 205 or 313, or permission of instructor. Not offered 1985–86.
M W F 9:05. B. Finlay.
This course considers the application of basic psychological principles to the design and utilization of machines and work settings. Topics include the design of displays and controls, the effects of noise and fatigue on human performance, and the nature of person-computer interactions.

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).
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; finding targets, and establish connections; the growth and development of reflex 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 Spring. 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). Not offered 1985–86; next offered 1986–87.
M W F 9:05. B. Finlay.
We will study the relation between structure and function in the central nervous system. Human
neuropsychology and the contribution of work 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
Fall, Spring. 4 credits. Limited to 16 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 1985–86.

A seminar and practicum course for advanced students who have mastered the fundamental concepts of personality and psychopathology. An opportunity to explore issues in personality and psychopathology, particularly as they relate to issues of development, fantasy, attachment, and sex roles. Includes an experimental 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 Olfaction and Taste: Structure and Function (also Biological Sciences 429)
Fall. 3 or 4 credits (4-credit option requires a term paper or research project). Preference given to junior and senior psychology and biology students. Prerequisite: One 300-level course in biopsychology or equivalent. Not offered 1985–86, next offered 1986–87.

TR 9:05–10:05. B. Halpern.

The structural and functional characteristics of olfaction and taste will be explored by reading and discussing current literature in these areas. Structure will be examined at the light and electron microscope levels as well as at the molecular level. Functional studies will be primarily neurophysiological and biochemical aspects. The emphasis will be on vertebrates, especially air-breathing vertebrates in the case of olfaction, but there will be some coverage of invertebrate forms.

436 Language Development (also Human Development and Family Studies 436 and Linguistics 436)
Spring. 4 credits. Prerequisite: at least one course in developmental psychology, cognitive psychology, cognitive development, or linguistics. Recommended: a course in linguistics. S/U grades optional. Offered alternate years. Not offered 1985–86.

TR 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 also addressed, but major emphasis is on the child. The fundamental issue of relationships between language and cognition is also discussed.

440 Sleep and Dreaming
Spring. 4 credits. Limited to 15 students. Prerequisites: advanced undergraduate or graduate standing and permission of instructor. Not offered 1985–86.

443 The Politics of IQ.
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. Not offered 1985–86.


The research on individual differences in intelligence will be discussed as a primary example of how social and political considerations influence research. Of particular interest is how social and political factors shape the choice of research topics, methods of investigation, and the interpretation of results. The writings of Jensen, Herrnstein, Burt, Eysenck, Kamin, and their critics will be studied. The genetics of intelligence will not be covered.

450 Seminar in the Psychology of Gender (also Women's Studies 450)
Fall. 4 credits. Limited to 15 junior and senior psychology majors. Prerequisite: Psychology 277 and permission of instructor. Students will be asked to fill out a written application form; the form will be used to select participants and give permission to enroll.

Hours to be arranged. S. Bem.

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. In 1985 the topic will be the development of children's thinking about gender.

451 Quasi Experimentation
Spring, weeks 1–7. 2 credits. Prerequisite: Psychology 350 or equivalent. Offered in odd-numbered years. Not offered 1985–86.


Methods for approximating the rigor of laboratory experiments in field settings.

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 1985–86.

TR 10:10–11:40. Staff.

Mathematical approaches to psychological theory are discussed. Possible topics include choice and decision theory, signal detectability, measurement theory, scaling, stochastic models, and computer simulation.

467 Seminar: The Examined Self—A Psychohistorical View
Spring. 4 credits. Prerequisites: Psychology 325 or equivalent, and permission of instructor before course enrollment.

Spring, weeks 8–14. 2 credits. 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 historical context. Students should be prepared to write and talk about their own lives as well as the historical figures selected for study.

468 American Madness
Spring. 4 credits. Limited to 15 students. Prerequisites: Psychology 325 and permission of instructor. Not offered 1985–86.


This seminar will be devoted to an analysis of insanity as a psychological and historical phenomenon. Selected writings by the mentally ill and their defenders will be studied.

469 Psychotherapy: Its Nature and Influence
Spring. 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.

A seminar on the nature of psychotherapy. Issues related to therapeutic goals, differing views of the nature of man, ethical concerns, and research problems are also considered. Presentations by therapists of differing orientations and experiential and role-play exercises are an integral part of the seminar experience.

470 Undergraduate Research in Psychology
Fall or spring. 1–4 credits. S/U grades optional. Written permission from the staff member who will supervise the work and assign the grade must be included with the course enrollment material. Students should enroll in the section listed for that staff member. A section list is available from the Department of Psychology.

Fall, weeks 8–14. 2 credits. E. Pedhazur.

Practice in planning, conducting, and reporting independent laboratory, field, and/or library research.

471 Statistical Methods in Psychology I
Fall. 4 credits. Not offered 1985–86.

3.5 credits. W M F W 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.

472 Statistical Methods in Psychology II
Spring, weeks 1–7. 2 credits. Prerequisite: Psychology 471 or 350 or permission of instructor.


Multiple regression, at the level of Multiple Regression in Behavioral Research, by E. Pedhazur.

473 Statistical Methods in Psychology III
Spring, weeks 8–14. 2 credits. Prerequisite: Psychology 472 or permission of instructor. Offered in even-numbered years. Not offered 1985–86.


Factor analysis and other multivariate correlational methods.

474 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 1985–86.

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 graphical-analytic theory.

477 The General Linear Model
Fall, weeks 8–14. 2 credits. Prerequisite: Psychology 473 or equivalent. Offered in even-numbered years. Not offered 1985–86.


Applications of multiple regression to problems in analysis of variance, analysis of covariance, and nonlinear relationships.

478 Psychometric Theory
Fall, weeks 8–14. 2 credits. Prerequisite: Psychology 473 or permission of instructor.


Statistical methods relevant to the use, construction, and evaluation of psychological tests.

479 Multisample Secondary Analysis
Fall, weeks 11–14. 1 credit. Prerequisite: Psychology 350 or equivalent.


Statistical methods for analyzing and integrating the results of many independent studies on related topics.

481 Experimental Social Psychology (also Sociology 481)
Fall. 4 credits. Limited to 30 students. Prerequisite: a course in social psychology or permission of instructor. Not offered 1985–86.


Selected topics in social psychology are examined in depth, with heavy emphasis on experimental research. 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.

482 Death and Dying
Spring. 4 credits. Limited to 20 juniors and seniors. Prerequisites: 6 credits in sociology or psychology


Issues of death and dying in modern American society are explored from the perspectives of psychology, sociology, and the health-related professions. Possible topics include the nature of death and dying in historical context, sociocultural dissonance, attrition processes, judgmental heuristics and biases, and research methods in social psychology.
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 1985–86. T R 12:20–2:15. W. W. Lambert. Representative theories of research on socialization at different ages are analyzed, focusing particularly on the underlying hypotheses. The newer topic of personal and sociocultural maturity is also analyzed, and its relation to socialization processes is evaluated in terms of recent evidence.

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). 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 research methods for studying close relationships. Students will individually generate hypotheses about aspects of relationships and develop research strategies for testing them.

Human Development in Post-Industrialized Societies (also Human Development and Family Studies 485) Spring. 4 credits. Limited to 20 juniors and seniors. No prerequisites. Common Learning course. 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 these 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 Ancient and European history (Stuart Blumin 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.

Interpersonal and Social Stress and Coping (also Sociology 486) Fall. 4 credits. Limited to upperclass students. Prerequisites: background in psychology and introductory statistics, or permission of instructor. T 2:30–4:25. W. W. Lambert. A critical review of work in intrapsychic, interpersonal, situational, and sociocultural sources of stress and the major psychophysiological concomitants of such stress: resounding coping strategies and aids to coping. Data from laboratory, industry, and other cultures will be analyzed.

Development in Context (also Human Development and Family Studies 486) Fall. 4 credits. Prerequisites: upperclass majors in human development or psychology, and one course in statistics, or permission of instructor. W F 1:25–3:20. 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.

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 1985–86. T 2:30. Staff. The specific topics of discussion vary, but the general emphasis is on a critical examination of the study of individuals in social contexts.

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. M W F 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 psychologists, psychoanalysis, and cognitive psychology. Emphasis will be on the ideas that have shaped modern psychology.

Sensory Function (also Biological Sciences 492) Spring. 4 credits. Prerequisites: A 300-level course in biopsychology, or Biological Sciences 222 or 311, and permission of the instructors. Students are expected to have a knowledge of elementary physics, chemistry, and behavior. S-U grades optional. Offered alternate years. Not offered 1985–86. M W F 10:10–11:05. S. Calhoun and P. Halpern. This course covers classical topics in sensory function such as vision, hearing, touch and balance, as well as some more recent 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 process of information flow 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. Cossen.

Junior Honors Spring. 4 credits. Prerequisite: admission to the departmental honors program. Staff.

Senior Honors Dissertation Fall. 4 credits. Prerequisite: admission to the departmental honors program. Staff.

Senior Honors Spring. 4 credits. Prerequisite: admission to the departmental honors program. Staff.

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 seminars to be offered 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.


Language and Thinking Psycholinguistics Cognition Psychobiology Topics in Perception and Cognition Physiological Psychology Sex Differences in Brain and Behavior Biological Sciences 524 Topics in Psychopathology and Personality Methods in Social Psychology Methods of Child Study Human Development and Behavior Proseminar in Human Experimental Psychology Fall or spring. 4 credits. Not offered 1985–86. M W F 11:10–12:40. Staff. Research and theory will be surveyed in the areas of perception, memory, attention, language development, cognition, and quantitative methods, with the goal of providing the graduate student with a broad framework of issues in contemporary human experimental psychology.

Proseminar in Social and Personality Psychology Spring. 4 credits. Not offered 1985–86. W 2:30–4. T 12:15–1:45. Staff. Research and theory in social and personality psychology will be surveyed with the goal of providing the graduate student with a broad understanding of contemporary issues in these fields.

Proseminar in Biopsychology Fall or spring. 4 credits. Not offered 1985–86. Hours to be arranged. Staff. Survey of research and thought on the evolution and mechanisms of behavior.

Experimental Social Psychology Sociocultural Stress, Personality, and Somatic Pathology Social Structure and Personality Social Interaction 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
128 Introduction to Psychology: Personality and Social Behavior
209 Developmental Psychology
215 Introduction to Linguistics and Psychology
281 Interpersonal Relations and Small Groups
325 Introductory Psychopathology
381 Social Psychology
385 Theories of Personality
469 Psychotherapy: Its Nature and Influence

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, spring, 1993 Goldwin Smith Hall, 256-4047), W. M. Pinter (chairperson), S. Senderovich (director of undergraduate studies, fall, 1994 Goldwin Smith Hall, 256-4047)

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 291—292, 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 theoretical insight and practical research skills appropriate for the study of social life. Graduates of the department take up careers in university, government, and private settings and in law, business, applied engineering, public policy planning, architecture, education, and offer 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) population studies; and (e) social psychology.

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) Sociology 101 and 201 with a 3.25 minimum grade-point average; (2) no later than the junior year, the 301—311 sequence and one semester of 491; (3) during the senior year, 495—496 and one additional 400-level or higher-level course; (4) 14 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. This major is intended for those who wish to graduate with honors earned through extensive research experience.

**Requirements for general sociology:** (1) Sociology 101 and 201 with a 2.5 minimum grade-point average; (2) the 301–311 analysis sequence; (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 220 for a description and a list of requirements.

**Requirements for all majors:** Calculus is not required, but is recommended for all majors. More advanced courses may be substituted for Sociology 301 or 311 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 change, and culture, or social psychology, 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 its 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.

**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 propose a project under the supervision of the faculty member. Opportunities are available to work on projects sponsored by the Center for International Studies, the International Peace, Security and Conflict Resolution Program, the 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 1985–86]**

MW 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 Hammett, Cain, and Chandler; sociological and biographical accounts of crime are compared to the fictional works.

**100.3 Sociology of Organizations** Fall or spring. 3 credits.

TR 8:40–9:55. D. Fish.

This seminar will explore a ubiquitous but often misunderstood phenomenon: organizations. Increasingly our daily lives may be depicted as a series of interactions with organizations, whether they be of a religious, political, educational, or economic nature. Our exploration of classical and current theories and applications of these theories will be framed by a larger concern with the development of a sociological imagination. From Weber on bureaucracy and Michels on oligarchy to Kanter on women and the structure of organizations and Rooney's analysis of skid row rescue missions, this course will examine a variety of organizational forms and perspectives on organizations. Essays will serve to deepen student appreciation of the expanding role of organizations in modern society as well as the historical emergence of this field.

**100.5 Work Life and Change in America** Fall or spring. 3 credits.


Work as an all-pervasive 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 has 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? Is there a 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.


Emphasis on training students in the proper writing skills for accurate and effective usage in the social sciences. Sociology includes culture, social change, intergroup relations, the urban experience, language, and bilingualism. Readings include second-language interference, dialects and "the language of the marketplace," the media and pop English, and ethnographic process of English. Biweekly assignments will be based on these topics. Extensive use of group discussions, guest speakers, voluntary oral presentations, and research techniques for written assignments.

**100.7 Hard Choices** Spring. 3 credits.


Many people believe that no restrictions should be placed on the pursuit and dissemination of scientific, medical, and technical knowledge. But what if a research technique may endanger public health and safety or published research findings can be exploited for bad ends? Are restrictions then appropriate? What form should they take? Who should decide? We will examine how such questions challenge many traditional attitudes toward knowledge and pose dilemmas for science, medicine, universities, and society. Discussion will be based on readings in drama, fiction, political philosophy, philosophy, sociology, and scientists' discussion and debate over genetic engineering.

**100.8 Rural Life as Metaphor** Fall. 3 credits.


There is a long and influential literary tradition of using images of rural life to express attitudes, beliefs, and even ideologies about the social order, culture, economics, politics, aesthetics, and morality. We will follow this tradition in English verse and look at its influence on painting, essays on politics and culture, and advertising in England and America. Our thematic focus will be on images of rural life in relation to rural poverty (especially in eighteenth- and nineteenth-century England) and to technology (especially, eighteenth- and twentieth-century America).

**100.10 Sociology of Latin America** Fall or spring. 3 credits.

MWF 1:25–5:15. S. Siskin.

Toxic wastes. Genetic engineering. Nuclear war. Health care. 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.

**Introductory Courses**

The recommended introductory sequence is Sociology 101–201, but either course may be taken alone. Sociology 101 provides a comprehensive survey of the discipline, and only a few credits are identical to Sociology 102, and may be substituted for it. Sociology 201 is somewhat more advanced; it introduces students to the discipline through an intensive analysis of case studies and research reports. Fewer topics are covered in Sociology 101 than in Sociology 201, but these are treated in greater detail. Either course may serve as prerequisite to most 200- and 300-level courses in the department.

**101 Introduction to Sociology** Fall or spring. 3 credits.

M W F 11:15–12:05 plus disc to be arranged; F classes will meet every second week. Fall: L. Metzler and staff; spring: B. Rubin and staff. In the fall, most of the professorial staff of the Department of Sociology participates in teaching this course, each professor lecturing on his or her own specialty. Topics covered include most of the following: socialization, culture, deviance, social control, interpersonal interaction, small groups, organizations, family, inequality, mobility, race and ethnic relations, population dynamics, urbanization, social change, social movements, modernization, methods of research, applications. Weekly section meetings actively involve students in the practical utilization of sociology. Case histories and application exercises are analyzed. Course assignments will be designed to encourage active participation of students in the writing of research papers. Partial credit will be given for group presentations and term papers.

**101 Sociology of Latin America** Fall or spring. 3 credits.

TR 12:20–1:35. M. Hannon and staff. With its emphasis on the evaluation of case studies and research reports, this course aids in the development of analytical skills and critical thinking in the foundations of sociological analysis. Each module concentrates on one social issue of vital concern while illustrating the distinctive ways in which sociologists differentiate. Rural Sociology 101 is virtually identical to Sociology 101 and may be substituted for it. Sociology 201 is somewhat more advanced; it introduces students to the discipline through an intensive analysis of case studies and research reports. Fewer topics are covered in Sociology 101 than in Sociology 201, but these are treated in greater detail. Either course may serve as prerequisite to most 200- and 300-level courses in the department.

**201 Sociological Analysis (also Human Development and Family Studies 201)** Fall or spring. 3 credits.

TR 12:20–1:35. M. Hannon and staff. With its emphasis on the evaluation of case studies and research reports, this course aids in the development of analytical skills and critical thinking in the foundations of sociological analysis. Each module concentrates on one social issue of vital concern while illustrating the distinctive ways in which sociologists differentiate. Rural Sociology 101 is virtually identical to Sociology 101 and may be substituted for it. Sociology 201 is somewhat more advanced; it introduces students to the discipline through an intensive analysis of case studies and research reports. Fewer topics are covered in Sociology 101 than in Sociology 201, but these are treated in greater detail. Either course may serve as prerequisite to most 200- and 300-level courses in the department.

**General Education Courses**

**202 Writing in Social Science (also Writing 202)** Fall or spring. 3 credits.


**with a good measure of clarity, and the contribution 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 after the problems selected for investigation and analysis, and changes in the ways we think about social problems.**

**100.11 Science in the Political Arena** Spring. 3 credits. Not offered 1985–86.

Hours to be arranged. S. Hilgartner.

Toxic wastes. Genetic engineering. Nuclear war. Health care. 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.
[207] Ideology and Social Concerns Fall. 3 credits (4-credit option available). Not offered 1985–86.
MWF 11:15. R. M. Williams, Jr.
Analysis of social and cultural bases of public policies at national, state, and local levels. Relations of demographic, social, and cultural factors to the changing recognition of problems and to shifting modes of collective action such as direct mobilization, legislation, court action, and adjudication. Public issues examined include affirmative action, civil rights, environmental regulation, military affairs, social security and income maintenance, health, medicine, biotechnology, and the environment. 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 1985–86.
MWF 11:15. R. M. Williams, Jr.
Are human societies fundamentally cooperative or conflictive? In what ways? Why? And with what consequences? Examination of contemporary sociological analyses and the views of such precursors as Hobbes, Marx, Sunner, and Simmel. Data from recent studies of conflict and conflict reduction are discussed.

214 Sociological Perspectives on Housing (also Consumer Economics and Housing 148) Spring. 3 credits (4-credit option available). Not offered 1985–86.
MWF 11:15. H. Velez.
An introductory sociological course analyzing the distribution of housing and population within urban areas. Students focus on the link this urban social and spatial structure has to the quality of urban life. Topics include urban ecology, mobility and migration patterns, suburbanization, segregation, urban social stratification, community power, crime, and poverty.

[230] Population Problems Spring. 3 credits (4-credit option available). Not offered 1985–86.
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). TR 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, femininity, and sex roles, industrialism, economic development, and psychocultural conflict.

[241] Applied Sociology Fall. 3 credits. (4-credit option available). Not offered 1985–86.
MWF 11:25. S. Caldwell.
Established professions—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). Fall. 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 these systems, and examine various structures designed to reduce or eliminate inequality.

257 Japan: A Sociological Analysis Spring. 4 credits.
TR 8:40–9:55. L. Cornell.
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, equal 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).
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 the 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.

263 Black Americans: Recent Social Changes Fall. 3 credits (4-credit option available). Prerequisite: one course in sociology or Africana studies.
TR 12:45–2:15. T. Williams.
A critical synthesis of research evidence on the status of Black Americans since World War II. Primary emphasis is on changes in four major institutional sectors: economic, political, education, and social and cultural integration, and separation. The latter sector includes residence and housing, voluntary associations, religious organizations, mass communications, expressive culture and ideologies. The processes and societal functions of small groups: (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 related to the psychology of sex roles, including psychological androgyny, women's conflict over achievement, the male sex role, equilatarian marriage relationships, gender-liberated child-rearing, female sexuality, homosexuality, and transsexualism.

280 Introduction to Social Psychology (also Psychology 280) Spring. 3 credits (4-credit option available). TR 8:40–9:55. T. Gilovich.
An introduction to research and theory in social psychology. Topics include human processing of social information; social influence, persuasion, and attitude change; social interaction and group phenomena. The application of social psychological knowledge to current social problems will also be discussed.

283 Groups and Relationships Fall. 3 credits. M 8:30–10 a.m. B. B. Betzer.
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 effects we have on others, and an understanding of how these phenomena relate to larger societal phenomena.

Intermediate Courses

301 Evaluating Statistical Evidence Spring. 4 credits.
MWF 11:15. S. Caldwell.
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.

310 Sociology of War and Peace Fall. 4 credits. V. Nee.
Every human group, community, or society presents many examples of altruism, helping, cooperation, aggression, and social hostility. Each grouping or society also manifests numerous examples of competition, rivalry, opposition, 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 community accepted but erroneous notions of the causes and consequences of war and deference. It deals with the major theories concerning the sources of war in international and intrasociocultural systems. The last half of the course analyzes the modes, techniques, and outcomes of efforts to restrict, regulate, and resolve international conflicts.
course, then, is to explore, and thereby increase our
organized, rewards are distributed, and (though
trapped in jobs that deaden the senses, cramp
crime, and provide only a paycheck as a reward.
Nevertheless, the centrality of work in most of our lives
is taken for granted; so too are the ways in which work is
organizations, communities, and nations.

328 Sociology of Work
Spring. 4 credits. Prerequisite: a course in statistics is strongly
recommended.

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 hours working. Some will spend
that time engaged in activity they enjoy. Others will be
whipped in jobs that deplete the senses, cramp
creative productivity, and provide only a paycheck as a reward.
With the exception of those too rich, too ill, too young, or
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that time engaged in activity they enjoy. Others will be
whipped in jobs that deplete the senses, cramp
creative productivity, and provide only a paycheck as a reward.

341 American Society
Spring. 4 credits. Prerequisite: a course in sociology or permission of
instructor. Not offered 1985–86.

Analysis of a broad social system. Critical study of the
institutions of kinship, stratification, the economy,
the police, education, and religion. Special attention is
given to values and their interrelations and to deviance and
deviation. Emphasis on the roles of the groups and associations
marking up a pluralistic nation is included.

342 Women and Development in East Asia
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. M W F 10:10. C. Bohmer.
Legal doctrines are social 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)
A view of science less as an autonomous activity than as
a social and political institution. We will discuss
socializations of sociology of science, science, and
scientific communities and 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. Prerequisite: a course in the social sciences.
Health, illness, death, and health institutions from a
sociocultural perspective. Factors affecting health care;
organization of the medical professions; 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 option. Prerequisites: HDF 150 or one 200-
level social science course. This course introduces students to the dynamics of family life in capitalist
America.

363 Political Sociology
Spring. 4 credits.

M T R 10:10–11:30. V. Nee.
Analysis of state and society relations in socialist societies that examines the tensions between planning
and market, and equality and equity, center and locality,
bureaucratic domination and individual choice, ideology and the dynamics 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.

364 Race and Ethnicity
Fall. 4 credits.

An examination of the social and cultural context of race and ethnic relations in the United States and other societies.
Alternative explanations—melting pot assimilation theories, internal colonialism, and Marxist
perspectives—are compared and 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 multicultural societies, such as South Africa and Malaysia, are also studied.

367 Latin American Society
Spring. 2–3 credits (third credit earned by doing a research paper).
Latin American revolutions examined in the context of
long-term processes of social and economic change.
Focus on Mexico, Cuba, and Central America. Topics include development strategies, the relationship
between economic growth and distribution, class
conflict in urban and rural settings, demographic
change, and the influence of foreign investors and their
governments.

375 Economic Sociology
Fall. 4 credits.


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 in harmony with our values, how 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 as members of a society).

380 Beliefs and Attitudes (also Psychology 380)
Spring. 4 credits. Prerequisite: some familiarity with the topic of attitudes from prior courses, or permission of
instructor. Not offered 1985–86.

M W F 1:15. L. Meltzer.
An intermediate course in social psychology. Attitudes are viewed as emotionally charged beliefs that underlie
ideologies, values, interpersonal feelings, and religious
beliefs. 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 in harmony with our values, how 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 as members of a society).

383 Social Interaction (also Psychology 383)
Spring. 4 credits. Prerequisite: a course in social psychology.

Fine-grains 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. Prerequisites: a course in psychology and one in either social or cultural anthropology, or permission of instructor.

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, stereotypes, ideology, sociocultural development, and mental illness.
Problems of how one can learn 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 1985–
86.

T R 1–2:15. W. W. Lambert.
An intermediate analysis of comparative features of the
historically and currently important theories 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 with substantial preparation as well as
for graduate students in sociology and related disciplines. Students who are not sure 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.

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 (Marx, Weber, Durkheim,
de Tocqueville) and contemporary counterparts; (3)
application of the classical ideas in contemporary

403 Social Networks and Social Structures
Fall. 4 credits. Not offered 1985–86.

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 organizational relations, community
studies, social mobility, 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) Spring. 4 credits. Prerequisite: Sociology 230 or permission of instructor. Not offered 1985–86.


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) Spring. 4 credits. Prerequisite: graduate standing or permission of instructor. Not offered 1985–86.


Elementary matrix algebra, probability theory, and calculus.

[420] Mathematics for Social Scientists Fall. 2–4 credits.


The ways in which societies try to affect demographic theories and operational research procedures. Special focus is on government policies and programs to reduce fertility.


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 Fall. 4 credits. Prerequisites: junior class standing or permission of instructor.

M W F 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.

M W F 9:05. R. Avery.

A description of the nature of demographic data and the specific techniques used in their analysis. Mortality, fertility, migration, and population projection are covered, as well as applications of demographic techniques to other types of data.

[439] Social and Demographic Changes in Southeast Asia Spring. 4 credits.

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 contemporary studies of demographic change in Southeast Asia.

[442] Family and Population in History Fall. 4 credits.

R 2:30–5. L. Cornett.

This course analyzes fertility and mortality patterns and their effect on household structure 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.


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).

[447] Social Aspects of Housing and Neighborhood (also Consumer Economics and Housing 443) Fall. 3 credits. Prerequisites: Consumer Economics and Housing 148 or Sociology 214. S-U grades optional.


The relationships between housing and social behavior and organization are examined. Levels of analysis include the physical features of housing that influence human behavior and the quality of life, the housing composition of neighborhoods, and the congruency between local housing and population.

[468] Women and Achievement Fall. 4 credits.


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.

[481] Experimental Social Psychology (also Psychology 481) Fall. 4 credits. Limited to 30 students.

T R 2:30–3:45. D. Regan.

Selected topics in social psychology are examined in depth, with heavy emphasis on experimental research. Readings are usually original research reports. Topics discussed may include social comparison theory, cognitive determinants of the emotions, cognitive dissonance, attribution processes, judgmental heuristics and biases, and research methods in social psychology.

[483] Socialization and Maturity (also Psychology 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 1985–86.


Reproduction and socialization 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 and graduate students.


A critical review of work in intrapersonal, interpersonal, situational, and sociocultural sources of stress; the prevalence of family limitation, changing 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 Lis Halls. 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 enter enrollment 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. W. L. Lambert.

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 with 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. Olzak.

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.

[502] Basic Problems in Sociology II Spring. 4 credits.

Hours to be arranged. Staff.

[505] Research Methods I: Logic of Social Inference Fall. 4 credits. Prerequisite: a first course in statistics and probability.

T R 10:10–12:05 plus 1 lab to be arranged. S. Caldwell.

The statistical 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: conceptualization, design, specifying, exploring, testing and evaluating models; dissemination and influence of results. Scope includes survey, comparative-historical, and experimental styles. Work load includes weekly exercises with data, attention to subject-matter 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 models for analyzing continuous (interval or ratio scale) outcome variables, emphasizing the general linear model. Model assumptions, consequences of violation, 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 555.


Treatment of models and methods for analyzing qualitative (discrete) outcomes. Attention is given to both static and dynamic models and methods. Topics covered include log-linear models for 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 who have permission of the instructor. Which seminars are to be offered any term is determined in part by the interests of the students, but it is unlikely 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 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.

515 The Politics of Technical Decisions I (also City and Regional Planning 541, Management MBA 686, and Government 628) Fall. 4 credits. W 2:30–4:30. D. Nelin. 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, and Government 628) Spring. 4 credits. Prerequisite: The Politics of Technical Decisions I. Hours to be arranged. D. Nelin. 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.

520 Field Research in Sociology Spring. 4 credits. 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 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 tasks that are 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 1985–86. Hours to be arranged. Staff. Multivariate statistical methods with explicit treatment of measurement error. Classical test theory, path analysis of unmeasured variables, econometric "errors-in-variables" models, confirmatory factor analysis, and Joreskog's general model for estimating linear structural relations (LSREL). Introduction to latent variable analysis. Emphasis on applications.

541 Sociological Theory Spring. 4 credits. Prerequisite: graduate standing or permission of instructor. Not offered 1985–86. M W 1:25–3:20. R. M. Williams, Jr. 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 structures, cultural content, 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 Spring. 4 credits. T 2:30–5. M. Hannan. Considers 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 1985–86. R 2:30–4:25. B. C. Rosen. 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 1985–86. R 3:30–5:30. C. Hirschman. Survey of Malaysian society from prehistoric 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 racial tensions, Malay social structure, the "Emergency," postindependence politics and parties, economic planning and the New Economic Policy, and demographic changes. Students will write research papers.


616 Business, Labor, and the State Fall. 4 credits. M 7:30–9 p.m. B. Rubin. An advanced seminar in the political economy of capitalism. Political economy is an approach to the study of social structure that emphasizes the interrelations of political forces and economic structures in a given historical context. The underlying concerns of the course and the issues that will structure most of the reading and discussions are the differential consequences of advanced capitalism. For example: Who benefits from certain economic processes (inflation, unemployment, and economic growth)? Does state intervention in the economy freeze existing distributinal structures? Does state activity redistribute the economic pie from one group to another? Has the working class materially benefited from unionization and militancy.

624 Advanced Methods of Epidemiology (also Veterinary Medicine 665) Fall. 4 credits. Not offered 1985–86. R 3:30–5. B. Edmonston. This course will emphasize knowledge essential for epidemiologic research. It will cover key issues in the planning, management, analysis, and interpretation of epidemiologic research. These topics include design options, sampling strategies, measures of disease frequency and association, risk assessment, validity, selection, information and misclassification bias, confounding interaction and effect modification, stratified analysis; matched analysis; and application of multivariate statistical modeling (including logistic and survival analysis). This course will prepare students to appreciate and conduct epidemiologic research.

645 Comparative Race and Ethnic Relations Spring. 4 credits. R 2:30–5. S. Ozok. Evaluation of recent research and theory in the study of race and ethnic relations, including analysis of the stability and dynamics of ethnic boundaries, causes of ethnic solidarity, and ethnic collective action. We will also examine causes of ethnic stratification, mobilization, separation, and other forms of ethnic social movements and protest.


670 Community, Housing, and Local Political Processes (also Consumer Economics and Housing 670) Spring. 3 credits. S-U grades optional. Not offered 1985–86. T 1:25–4:25. A. Shlay. A seminar directed at establishing linkages between the organization of space, political power, and social welfare. Part one examines theoretical and empirical perspectives on power, community power, models of residential differentiation, and political outcomes. Part two examines the politics of metropolitan organization and the linkages between spatial form, social reproduction, and social control. Part three works towards defining the parameters whereby community (spatially proximate people) is or can become a viable arena for social change.

671 Power, Participation, and Public Policy (also Consumer Economics and Housing 671) Spring. 3 credits. S-U grades optional. Offered alternate years. T 1:25–4:25. A. Shlay. This course explores the sources of American political stability by concentrating on the ways in which political power and participation are managed within the public policy arena. The first part of the course focuses on competing theories of political stability and legitimacy. The second part focuses on political processes and modes of political action. The third part examines power structuration, focusing on the empirical work that looks at the link between the activity of power wielding and class structure.

683 Social Interaction (also Psychology 683) Fall. 4 credits. M 2:30–5. D. Hayes. Topic for 1985–86: microsociology—including topics such as face-to-face interaction, small groups, roles, and socialization—and the relevance of microsociology to macroscopic processes.

685 Sex Differences and Sex Roles (also Psychology 685) Fall. 4 credits. Not offered 1985–86. Hours to be arranged. S. Bem.


891–892 Graduate Research 891: Fall; 892: spring. Up to 4 credits each term, to be arranged. Prerequisite: graduate status and permission of a faculty member willing to supervise the project.

895–896 Thesis Research 895: Fall; 896: spring. Up to 6 credits each term, to be arranged. Prerequisite: permission of thesis director.

Swhahili
See Africana Studies and Research Center.

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 major in dance. These majors provide students with an education in theatre, 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 374 with a grade of C or better.
3) A grade of C or better in the following courses:
   a) Two courses chosen from Theatre Arts 375, 376, 378, and 379.
   b) Theatre Arts 377.
   c) Theatre Arts 475 or 477.
4) Six credits in other theatre arts courses.
5) Twelve 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, 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 technique only (see Theatre Arts 304, 306, 308). 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. Repertory 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 shown 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) Additional credits in related fields chosen in consultation with advisers.

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 over all credits 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 which fulfills the 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. Laboratories should be taken concurrently with allied content courses.

2) Rehearsal and performance laboratory: Students may enroll in Theatre Arts 156, 751, or 762 after being assigned roles through auditions in theatre or dance productions.

All production laboratory courses listed above may be repeated for credit and may be added without penalty at any time during the term with the permission of the instructor. Students are also encouraged to participate in Theatre Cornell productions at any time on an extracurricular noncredit basis.

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 an independent 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 or spring. 3 credits. Not offered in Theatre Arts 1985-86. TR 12:00-1:30. This course is meant to serve not 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. WF 1:125 or TR 10:45-12. 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. MW 9:05 or 10:10. 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...
211 Beginning Dance Composition and Music Resources
Spring. 4 credits. Prerequisite: Theatre Arts 210.
M W 6:30-8 p.m. P. Lawler, D. Borden.
Continuation of Theatre Arts 210.

230 Introduction to Theatre History
Fall. 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 a performance art 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.
M W F 12:00. A. Groos, R. Parker.
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 or summer.
3 credits.
M W F 11:15. Fall: J. Haackst.
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. Not open to first-term freshmen. Limited to 20 students.
Lectures, M W 3:30-4:25. Staff.
An introduction to design and technical processes in the theatre, with particular attention to the unique collaboration of playwright, director, designer, and performer. 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. The course is prerequisite to all higher-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 Willard Straight Theatre at 7:30 p.m. on the first Tuesday of classes.
Staff.
Specialized instruction and specific responsibilities in production positions such as light-board operator, wardrobe mistress, and set or properties-crew head, to prepare students for work in professional theatre. There will be lectures, demonstrations, and extensive practical work in departments别的 courses.

282 Introduction to Voice and Speech for Performance
Fall. 2 credits. Limited to 12 students. Primarily for department majors. Prerequisite: Theatre Arts 282.
Registration only through department roster in 104 Lincoln Hall.
Development of vocal technique with additional emphasis on articulation and basic skills of standard American English pronunciation.

283 Voice and Speech for Performance
Spring. 2 credits. Limited to 12 students. Primarily for department majors. Prerequisite: Theatre Arts 282.
Registration only through department roster in 104 Lincoln Hall.
Development of vocal technique with additional emphasis on articulation and basic skills of standard American English pronunciation.

284 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 134)
Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Physical Education 431 or permission of instructor.
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 136)
Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Physical Education 432 or permission of instructor.
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. 3 credits. May be repeated for credit.
M W F 1:25.
Readings, lectures, and practice sessions. Tuesdays and Thursdays.
The Monday and Wednesday classes will consist of learning basic movement vocabulary and dances. No previous experience in dance is necessary.

310 Advanced Dance Composition
Fall or spring. 4 credits. Prerequisite: Theatre Arts 210 or 211.
Hours to be arranged. Staff.
Further problems in composition for groups.

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 104 Lincoln Hall.
Study and practice in the development of vocal technique with emphasis on tone quality, breathing, alignment of the body, and speech practice of standard American English pronunciation.

283 Voice and Speech for Performance
Spring. 2 credits. Limited to 12 students. Primarily for department majors. Prerequisite: Theatre Arts 282.
Registration only through department roster in 104 Lincoln Hall.
Development of vocal technique with additional emphasis on articulation and basic skills of standard American English pronunciation.

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 134)
Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Physical Education 431 or permission of instructor.
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 136)
Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Physical Education 432 or permission of instructor.
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. 3 credits. May be repeated for credit.
M W F 1:25.
Readings, lectures, and practice sessions. Fridays and Tuesdays.
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 138)
Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Physical Education 436 or Physical Education 436 or permission of instructor.
Continuation of Theatre Arts 306.

310 Advanced Dance Composition
Fall or spring. 4 credits. Prerequisite: Theatre Arts 210 or 211.
Hours to be arranged. Staff.
Further problems in composition for groups.

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 104 Lincoln Hall.
Study and practice in the development of vocal technique with emphasis on tone quality, breathing, alignment of the body, and speech practice of standard American English pronunciation.

283 Voice and Speech for Performance
Spring. 2 credits. Limited to 12 students. Primarily for department majors. Prerequisite: Theatre Arts 282.
Registration only through department roster in 104 Lincoln Hall.
Development of vocal technique with additional emphasis on articulation and basic skills of standard American English pronunciation.

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.

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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. 3 credits. May be repeated for credit.
M W F 1:25.
Readings, lectures, and practice sessions. Fridays and Tuesdays.
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 138)
Fall or spring. 1 credit. May be repeated for up to 4 credits. Prerequisite: Physical Education 436 or Physical Education 436 or permission of instructor.
Continuation of Theatre Arts 306.

310 Advanced Dance Composition
Fall or spring. 4 credits. Prerequisite: Theatre Arts 210 or 211.
Hours to be arranged. Staff.
Further problems in composition for groups.

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.
312 Physical Analysis of Movement
Spring. 3 credits.
This course is an examination of human movement with particular attention to dance movement. Readings in Schweigard's Human Movement Potential. Guest lectures by experts in anatomy and health areas. Practical and laboratory work.

314 History of Dance
Fall. 3 credits.
T R 12:20–1:50. S. Barnes, Mellow Postdoctoral Fellow.
A look at the revolution in modern dance that began with Judson Dance Theatre in the 1960s. 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 1985–86.
Hours to be arranged.
A survey of the history of Western theatrical dance from the Renaissance to contemporary times.

318 Historical Dances
Spring. 2 credits.
Prerequisite: Ballet I or Modern Dance II. Not offered 1985–86.
P. Lawler.
A sampling of the social dances from the Renaissance to the present, with emphasis on pinpointing basic differences in movement styles and customs in the various periods. A major part of class time will be spent learning and performing the dances.

325 Classic and Renaissance Drama (also Comparative Literature 352)
Fall. 4 credits. Not offered 1985–86.
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)
Spring. 4 credits. Not offered 1985–86.
Readings from major dramatists from Corneille to Chekhov, including such authors as Molière, Congreve, Marivaux, Goldoni, Gozzi, Schiller, Kleist, Gogol, Ostrovsky, and Ibsen.

327 Modern Drama (also Comparative Literature 354)
Spring. 4 credits.
MWF 11:15. R. Gross.
Readings from major twentieth-century European dramatists from Claudel and Pirandello to Beckett and Müller.

331 The Classical Theatre
Fall. 4 credits.
Prerequisite: Theatre Arts 230 or permission of instructor.
An examination of major developments in the theatre—acting, staging, dramaturgy—and the historical background to the developments in Greek and Roman society. Representative plays will be read and discussed in their theatrical context.

332 The Medieval and Renaissance Theatre
Spring. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor. Not offered 1985–86.
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, 1642–1800
Fall. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor. Not offered 1985–86.
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. Special focus to be placed on the theatrical work of Molière, Goldoni, Garrick, Schroder, and Goethe and on the designers of the Bibbiena family. Representative plays of the period will be read and discussed in their theatrical context.

334 Romantic and Early Modern Theatre
Spring. 4 credits. Prerequisites: Theatre Arts 230 or permission of instructor.
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 1867 and 1914.

335 The Modern and Contemporary Theatre
Spring. 4 credits. Prerequisites: Theatre Arts 230 or permission of instructor. Not offered 1985–86.
The history of theatres and theatrical productions in Europe from the early modern theatre to the present day. Special consideration will be given to such central figures as Vsevolod Meyerhold, Leopold Jessner, Bertolt Brecht, Antonin Artaud, Louis Jouvet, Wieland Wagner, Peter Brook, and Josef Svoboda. The development of ensemble acting and the growth of the theatre profession as it is known today. Special attention will be given to the work of the Bibbiena family. Representative plays of the period will be read and discussed in their theatrical context.

336 American Drama and Theatre
Fall. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor.
T R 2:30–3:45. R. Paska.
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.
A study of traditional forms of Japanese theater. 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 techniques of performer training.

348 Playwriting
Fall. 4 credits. Prerequisite: permission of instructor.
T R 2:30–3:45. P. O'Driscoll.
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.
T R 2:30–3:45. P. O'Driscoll.
A continuation of Theatre Arts 348, culminating in the composition of a full-length play.

351 Production Laboratory III
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. 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.
Lectures, discussion, and projects on theatre architecture and equipment; scenic construction, mechanisms, 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. Prerequisite: Theatre Arts 250 or permission of instructor.
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 and 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 stylistic style, and an understanding of the theatrical process. Project work includes both the rendering of design projects and actual costume construction.

370 Stage Management
Fall. 1 credit.
Prerequisites: Theatre Arts 240 or 250.
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 greater understanding of the production process as experienced in the position of stage manager or assistant.

372 English Drama (also English 372)
Spring. 4 credits. Not offered 1985–86.
Major events in the English theatre from the Middle Ages to the beginning of the twentieth century. Plays by Shakespeare, Jonson, the Restored Master, Dryden, Wycherly, Congreve, Sheridan, Shelley, Shaw, and others. Dramatic texts, theatrical conventions, social conditions, and their interrelationships.

374 Introduction to Film Analysis: Meaning and Value
Summer or 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.

375 History and Theory of the Commercial Narrative Film
Fall. 4 credits. Fee for screening expenses, $10 (this fee is paid in class). Not offered 1985–86; next offered 1986–87.
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 artists. Emphasis on 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). T R 2:30–5:30 D. Fredericksen. Documentary figures covered include Vertov, Flaherty, Grierson, Ivens, Lanzmann, Reference, Capra, and Jennings. Within the history of the experimental and personal film, emphasis are the avant-garde of the twenties, the movement toward documentary in the thirties, the development of personal and experimental 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. T R 2:30–5:30 D. Fredericksen. The mechanics and expressive potential of 16-mm filmmaking, including nonsynchronous sound. Each student completes four short film exercises and a longer, sound film that will be shown publicly. Students retain ownership of all films they produce. No prior filmmaking experience is assumed.


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). T R 2:30–5:30 D. Fredericksen. Emphasizes on the contemporary documentary film as a sociopolitical force, as an ethnocentric tool within and without a filmmaker’s own culture, and as an artistic form with a distinct history and set of theoretical questions. Major figures, structures, and movements covered include Jennings, Rouquier, Leacock, Malle, Roux, Solanas, national film boards. Challenge for Change, direct cinema, cinema verite, and revolutionary documentary of the Third World.

380 Acting II—Characterization Fall or spring. 3 credits. Limited to 12 students. Prerequisites: Theatre Arts 291 and permission only through department roster in 104 Lincoln Hall. T R 10:10–12:05 F. Cole; spring, staff. Scene study and improvisational work designed to develop consistency in the student’s use of communicative action and emotional support in creating a role. Emphasis on text analysis, use of imagery in handling dramatic language, and exercises in emotional and sense memory.

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. T R 10:10–12:05 J. Thorp. Practice and application of skills and methods to various styles of acting, practical exploration of historical and social influences as determinants of style.

385 Skills, Techniques, and Approaches to Performance Spring. 2 credits. Prerequisites: Theatre Arts 301 or permission of instructor. Hours to be arranged. D. Feldshuh. This course will use the talents of visiting theatrical artists to present and put the student to 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.

396 German Film (German Literature 396 and Comparative Literature 596) Spring. 4 credits. Requirements: participation in class discussion; one paper, midterm, and final. M W F 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, 1918–1933; 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.

397 Fundamentals of Directing I Fall or spring. 3 credits. Fall: M W 11:15–1:15; spring: M W 2:30–4:30. D. Feldshuh. Discrete practical exercises that teach the student how to bring a written text to 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 composition.

418 Seminar in History of Dance Spring. 3 credits. Prerequisite: Theatre Arts 315 or permission of instructor. Not offered 1985–86.

431 Theory of the Theatre and Drama I Fall. 4 credits. Prerequisite: Theor or permission of instructor. Not offered 1985–86. 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: Theatre Arts history and dramatic literature work at the 300 level or permission of instructor. Not offered 1985–86. An intensive study of the plays of Corneille and Racine and of their theatrical and social background. The course will cover the principles of dramaticity, and all students will be expected to complete a dramatical assignment.

433 Dramaturgy: Play and Period Spring. 4 credits. Prerequisites: some theatre history and dramatic literature work at the 300 level or permission of instructor. Not offered 1985–86. An intensive study of the plays of Corneille and Racine and of their theatrical and social background. The course will cover the principles of dramaticity, and all students will be expected to complete a dramatical assignment.

434 Theatre and Society (also English 454) Spring. 4 credits. Prerequisite: some theatre history or dramatic literature work at the 300 level or permission of the instructor. Not offered 1985–86. An examination of the role theatre has played in society.

This year the course will focus on the English "Blue-Book" dramatists of the nineteenth century and in particular on the work of "Tolstoy.”

435 Special Topics Spring. 4 credits. Prerequisite: some theatre history or dramatic literature work at the 300 level or permission of instructor. T R 2–3. J. Thorp. Readings in Restoration and eighteenth-century drama.

451 Production Laboratory IV Fall or spring. 1–4 credits. May 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.

Preparation 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 382 and permission of instructor. Not offered 1985–86. M W F 10:10–12:05. H. Cole. 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 1985–86. M W 12:20–2:15. J. Thorp. Selected topics in the history of design style, the changing nature and functioning of stage spaces, and the role of the scenic space in the establishment of a dramatic strategy for the play in production.

466 Seminar in Costume Design Fall. 4 credits. May be repeated for credit. Prerequisite: Theatre Arts 366 and permission of instructor. Not offered 1985–86. M W 12:20–2:15. H. Cole, S. Perkins. This course builds on the Costume Design I topics (script analysis, period research, the use of the elements of design, developing figure drawing and painting, and understanding the theatrical process) by stressing the practical production situations that influence design and the relationship between designer, director, and the scenic geometry. Theatrical styles and actual production work are explored in more depth. Extensive project work includes both the rendering of design projects and actual costume construction.

475 Seminar in the Cinema I (also College Scholar Seminar) Spring. 4 credits. T R 10:10–12:05. D. Fredericksen. Topic for 1985-1986: Imagery is psyche. "Know thyself": this has been our culture’s most enduring psychological need, and it has been frequently offered as the raison d'être for liberal studies. C. G. Jung’s answer to how you might "know thyself" is based upon his claim that "image is psyche" and its informing metaphor is depth. The seminar will trace the elaborations of this position in Jung, James Hillman, Edward Alexander, Mount, Watkins, and others; it will also test the critical capacities of this position with respect to film images given us by Bergman, Fellini, Brakhage, Roeg, Gunvor Nelson, Suzan Pitt, Larry Jordan, Bruce Baillie, and others. The seminar’s claim might provide an archetypal and imaginative alternative to current approaches to liberal studies will be asked throughout the seminar; the nature of education will thereby become a central theme of the semester’s work.

477 Intermediate Film Projects Spring. 4 credits. Limited to 4 students. Prerequisites: Theatre Arts 377 or equivalent, and 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 $300. Students retain ownership of their films.

M W 10:10–12:05. M. Rivchin. The development and completion of individual projects,
with emphases on personal and documentary modes. Includes preparation of an original script or storyboard, direction, cinematography, synchronous sound recording, editing, and follow-through to a composite print.

495 Honors Research Tutorial Fall or spring. 1–4 credits. Prerequisites: senior standing and departmental acceptance as an honors candidate. Hours to be announced. Staff. Methods and modes of research for honors projects.

496 Honors Thesis Project Fall or spring. 1–4 credits. Prerequisites: senior standing and departmental acceptance as an honors candidate. Hours to be announced. Staff. Preparation and presentation of honors thesis or practicum.

498 Fundamentals of Directing II Fall or spring. 4 credits. Prerequisite: Theatre Arts 398. Fall: M W 2:30–4:25; spring: M W 11:15–1:15. Plus lab to be arranged. D. Feldshuh. This course builds on the exercises 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 Theatre Cornell group'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. 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. 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 104 Lincoln Hall. T 2–3:30. P. Curtis and other teachers from the American Mime Theatre. This seminar will give the student the opportunity to participate in a unique performing art created by a particular balance of playwriting, acting, moving, pantomime, and theatrical equipment. It is a complete theatre medium defined by its own aesthetic laws, terminology, script, material, and teaching methods, in which non-speaking actors, in characterization, perform the symbolic activities of American Mime 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 104 Lincoln Hall. F 2–4:25. P. Curtis and other teachers from the American Mime Theatre. A continuation of Theatre Arts 575.


636 Seminar in Dramatic Criticism Fall. 4 credits. Prerequisite: permission. Topic: the plays of Philip Barry, S. N. Behrman, and Robert Sherwood.


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. T 1:25–4:25. R. Ascher. In myth, stories 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. This technique is used in Foylaway 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 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.

672 Philosophy and Theory of Tragedy (also English 678) Fall. Not offered 1985–86. T. Murray.

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. M 2:30–4:30. B. Battick. 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 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 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. Enrolment limited to students in Theatre Arts 633 or 636. M 2:30–5. M. Hays. A study of methods and materials relevant to the solution of problems in theatre arts, including introduction to standard research techniques, 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. M–F 9:05–10:30. P. Saul. 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 foil, epee, sabre, 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 playwright'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. Hours to be arranged. Staff. Study, development, and performance of assigned roles.
Africana Studies and Research Center

J. Turner, director; Y. Ben-Jochannan, W. Cross, (director of undergraduate studies); 310 Trachammer Road, 256-4625); L. Edmondson, A. Graves, R. Harris, C. Mbabta, A. Nanji.

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 attractive alternative 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 on occasion arranged study tours 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 major's graduate 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- average in the center's courses in order to fulfill the major program. The Africana major must complete 36 credits in courses offered by the center, to include the following four core courses: AS&RC 231, 280, 360, and 431. Beyond these core courses, the student must take 8 credits of center courses numbered 200 or above and 16 credits numbered 300 or above. Within this selection the student must complete at least one of the following AS&RC courses: 302, 303, 304, 305, 306, and 307. 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 to 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 advisor and one additional faculty member, who 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 used in fulfillment of one of the following distribution requirements:


Language Requirement

Swahili fulfills the College of Arts and Sciences language requirement. Successful completion of AS&RC 131, 132, 133, and 134 provides qualification in Swahili. 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. Hours to be arranged. A. Nanji.

132 Swahili Spring, 4 credits. Prerequisite: Swahili 131 or permission of instructor. A. Nanji.

133 Swahili Fall and Spring, 4 credits. Prerequisites: Swahili 131 and 132.

134 Swahili Spring, 4 credits. Prerequisites: Swahili 131, 132, and 133 or permission of instructor. A. Nanji.

Notes:

Swahili fulfills the College of Arts and Sciences language requirement. Successful completion of AS&RC 131, 132, and 134 provides qualification in Swahili. 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.

171 Infancy, Family, and the Community Fall, 4 credits.

172 Teaching and Learning in Black Schools Spring, 4 credits.


202 Swahili Language Fall, 4 credits. Prerequisite: Swahili 134. Offered on demand. A. Nanji.

203 History and Politics of Racism and Segregation Spring, 4 credits. M T 12:20–1:25, C. Mbabta.

210 Afro-American Writing and Expression Fall, 4 credits. T R 10:10, A. Graves.

211 Afro-American Writing and Expression Fall, 4 credits. T R 10:10, A. Graves.


217 Teaching and Learning in Black Schools Spring, 3 credits. T R 10:10, A. Graves.

218 Afro-American Writing and Expression Fall, 4 credits. T R 10:10, A. Graves.

219 Afro-American Writing and Expression 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 children from 1960 to the present. Students write a pamphlet containing their own poems, fiction, and poetry and compile a bibliography of literature for Black children.


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 Drama Spring. 3 credits. This course is intended to serve as an introduction to the history of Black drama and to provide the means through which students can cultivate their interests in dramatic theory and production techniques. Each student in the course will read a number of Black plays, write a critical paper on Black drama, and participate in the production of a play.

290 The Sociology of the Black Experience Fall. 3 credits. M W 3:10. J. Turner. An introductory course to the sociology of the Black experience and to the field of Afro-American studies. Required for all undergraduate students majoring at the Africana Center.

301 Seminar: Psychological Aspects of the Black Experience Spring. 4 credits. Prerequisite: permission of instructor. M 1. W 2:30-4:15. Existing research is used to raise specific questions about new cultural political awareness in the Black community. The focus is on individual conversion experiences within the context of social movements. The transformative roles of political groups (for example, Black Panther party) and outstanding activists and intellectuals (such as Malcolm X) are used as reference points for analytical discussion of 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. Not offered 1985–86. The focus is on the general theory of communications, the function of the mass media, 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.

344 Neocolonialism and Government in Africa (The Politics of Public Administration) Fall. 4 credits. Offered alternate years. TR 1:25–2:15. The course is designed to explain why Africa's public administrations in the postcolonial era have generally failed to move from the colonialist ethos to becoming primary instruments for initiating and guiding the processes of development. The reality of colonialism was bureaucratic centralism—the closest approximation to the ideal 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 various expressions 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 ASARC 171. Offered alternate years. L. Fitzgerald.

346 African Socialism and Nation Building Spring. 4 credits. An exploratory 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. Hours to be arranged. This course will address the social organizations, political protests, and political ideologies written by or about Black women in the United States, from slavery to the 1960s. Topics will include the special role of Black women in slavery, the political protest thought of Black women writers in the nineteenth and twentieth centuries (e.g., Ida B. Wells, Mary Church Terrell, Ella Baker, Mary McLeod Bethune, Eleanor Holmes Norton, Angela Davis), the emergence of Black feminism, and the various social-political controversies surrounding the relationship of Black women to both the civil rights and Black power movements.

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 domestic and international experiences of Caribbean societies. Special attention will be given to conflicting definitions and perceptions of the Caribbean; contrasting theories of Caribbean social structure and models of development; the continuing salience of struggles for change and transformation; prospects of regional integration; and Caribbean societies in 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.


361 Afro-American History (African Background to the Twentieth Century) Fall. 3 credits. M W F 10:10. R. Harris. The course surveys the transition of Africans to America through the process of enslavement and their transformation into Afro-Americans. Explores the transition from slavery to freedom through the process of emancipation to the development of Black Americans from chattel slaves into rural peasants. Its purpose is to understand the internal dynamics of the Black experience from African origins to the age of segregation.

370 Afro-American History (the Twentieth Century) Spring. 3 credits. M W F 12:20–1:55. C. Mbata. 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 and the transformation of the Afro-Americans from second-class into first-class citizens. Its purpose is to understand historical antecedents for the current socioeconomic, political, and cultural status of Afro-Americans.

381 Contemporary African History Spring. 3 credits. M W 12:20-1:25. C. Mbata. A survey of the present problems on the African continent as they appear from 1950 to the present time. Important 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.

392 Comparative Slave Trade of Africans in the Americas Fall. 3 credits. TR 1:25–2:30.
to literary themes and attitudes current in specific periods and movements—from post–World War I to the present.

455 Modern Caribbean Literature Spring. 4 credits.
W 2–4:25. A. Graves. A 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 recurrences 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 other boundaries to uncover the underlying shared experience.

460 History of African Origins of Major Western Religions Fall or spring. Offered alternate years. 4 credits. Prerequisite: sophomores or permission of instructor. Y. Ben-Jochannan. This course is designed to develop an understanding of the basic origins of the philosophical, theosophical, and magical-religious teachings responsible for Judaism, Christianity, and Islam.

475 Black Leaders and Movements in Afro-American History Spring. 4 credits. TR 3:35–5:00. R. Harris. Analyzes the personalities, ideas, and activities central to the struggle for African-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. Offered alternate years.
A study of selected themes in African history, making use of work done in related disciplines. Until further notice the selected topics will be women in African history.

484 Politics, Conflict, and Social Change in South Africa Spring. 4 credits. W 1:25–4:25. L. Edmondson. A cross-national examination of past-to-present systems of white domination on the one hand and African liberation processes on the other. Southern Africa will further be analyzed as an international subsystem, with special attention paid to evolving region-wide patterns of conflict and cooperation. Also explored are the region's interactions with the wider world. The latter include the involvement of other African states, the impact of the United States and other Western foreign policies and nongovernmental interests, the involvement of the Soviet Union and other socialist states, and the role of the United Nations.

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. May be taken to fulfill requirements for a major in African or Afro-American studies.
M W 1:25. C. Mbata. 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 comprehensible conclusions and generalizations out of it.

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 the 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.

496–499 Independent Study 496, fall; 499, spring. Hours to be arranged. Africana Studies Center. For students working on special topics, with selected reading, research projects, etc., under the supervision of a member of the Africana Studies and Research Center faculty.

500 Political Theory, Planning, and Development in Africa Spring. 4 credits. TR 11:15–12:45. The course explores the processes of underdevelopment of Africa from the epoch of slavery through colonial and neocolonial phases of domination, drawing on the assumptions of "underdevelopment" theory. If time permits, it then turns up the differential content and emphasis on socialistic and capitalism 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 4 credits. Prerequisites: AS&RC 203 and 204 or 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 9:30–11:00. R. Harris. Studies 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 4 credits. Prerequisites: upperclass or graduate standing or permission of instructor. T 9:30–11:00. R. Harris. Studies the 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.

520 Historical Method, Sources, and Interpretation Fall. 4 credits. Prerequisite: upperclass or graduate standing or two of the following courses: AS&RC 203, 204, 283, 360, 361, 475, 484, 490. Offered alternate years.

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 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 Offered according to demand. 4 credits. Prerequisite: upperclass or graduate standing or permission of instructor. H.L. Edmondson. For description see AS&RC 351.

571 Seminar: Psychological Issues in the Black Community Fall. 4 credits. Prerequisite: permission of instructor. R 9:05–12:05. W. Cross. A critical examination of existing theory and research on identity development and identity transformation in Afro-American life, including Black identity metamorphosis that occurs within the context of social movements. Particular attention is given to (1) the interface between social systems and identity development and maintenance; (2) dual consciousness; (3) functions of identity in daily life; (4) conversion and deconversion within the contexts of the contemporary Black movement; (5) the psychohistorical implications of unidimensional theories of Black self-concept; (6) the relationships among identity, behavior, and ideology.

598–599 Independent Study 598, fall; 599, spring. Variable credit. For all graduate students.

698–699 Thesis 698, fall; 699, spring. Limited to Africana Studies and Research Center graduate students. Africana Center faculty.

American Indian Program
R. Fougner, director (216 Stone Hall, 256-6587). S. Saraydar, asst. prof. The American Indian Program (AIP) is a multi-disciplinary, interdisciplinary 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. The AIP offers 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 an opportunity for these teachers to develop new materials and strategies for teaching about American Indians and to gain skill in presenting these materials using these teaching strategies in a classroom situation.

A specific objective of the AIP is to assist Indian groups and organizations in their efforts 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 is also embarking on the replication of an authentic prehistoric 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. Advisers from the Indian community are assisting the AIP in meeting the objectives of this effort.

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 ALS 100 and four additional courses from those listed below. At least one course must be selected from each group. All course work must be approved by an advisor from the program.

For full descriptions of the following courses consult the listings under individual departments.

Introduction

ALS 100 Introduction to American Indian Studies

The Indian Traditions

Anthropology 230 Ethnology of Native North America

Anthropology 354 The Peopling of America

Indians in Transition

[ALS 318 Ethnology of the Northern Iroquois (also Anthropology 318) Not offered 1985–86.]

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

Rural Sociology 175 Issues in Contemporary American Indian Societies

Rural Sociology 242 American Indian Philosophies I: Power and World Views (also Anthropology 242)

Rural Sociology 243 American Indian Philosophies II: Native Voices (also Anthropology 243)

[Local Sociology 367 American Indian Tribal Governments (also Anthropology 367) Not offered 1985–86.]

Rural Sociology 440 Social Impact of Rapid Resource Development

Rural Sociology 442 American Indian Philosophies: Selected Topics (also Anthropology 442)

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, 275 Olin 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

J. L. Ford, chairman, biology and society major. Program on Science, Technology, and Society (632 Clark Hall, 256-3810)

The biology and society major is offered to students enrolled in the College of Agriculture and Life Sciences, the College of Arts and Sciences, and the College of Human Ecology. The major is coordinated for students in all colleges through the biology and society office. Students can get general, specific course requirements, and application procedures for the major from the office in 632 Clark Hall.

Because the biology and society major is multidisciplinary, students must attain a basic understanding of each of the several disciplines it comprises: theory and research 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 science 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. Applications from juniors 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

3) College calculus (one semester): Math 106, 108, or 111, or any higher-level calculus course.
7) Core course: B&Soc 301 (also Bio Sci 301 and Anthro 301).
8) An eight-course concentration area to include genetics, ethics, and statistics. It is to be developed by the student and his or her adviser. See below for course requirements and some suggested concentration areas.
9) Two issues in Biology and Society courses selected from the list below.
10) Senior seminar.

Concentration Areas for the Major

Students accepted into the major must develop with their advisor a coherent and meaningful grouping of courses representative of their special interest in biology and society. Examples of biology and public policy concentration areas include 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 advisers, their major concentrations from the following six categories:

1) a genetics course: Bio Sci 280 or 281, or Pt Br 225
2) an ethics course: B&Soc 205 (also Bio Sci 206 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, Govt 391, Math 372, Econ 319, CRIME 270, or Stats 601
4) any two additional biology or computer courses from the College of Agriculture, Biological 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 these areas satisfy this requirement. Opportunities in Biology and Society 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 pass a total of two courses, one course from the natural sciences and one course from either the humanities or the social sciences. Students should consult with their advisor 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 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, 632 Clark Hall. Independent study credits may not be used in completion of the major requirements.

Honor Program

The honors program is designed to challenge the academically talented undergraduate student whose major is in biology and society. 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, 632 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 if 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 (see above) is available to all students as an alternative to, or in advance of, an honors project.

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 the biology and society and the other a member of the Cornell faculty whose field of study corresponds with the student's topic. The purpose of the second adviser is to guarantee expertise in the subject matter covered by the student. Students in the College of Agriculture and Life Sciences must select this adviser from the area within which their thesis will be reviewed.

Students may take from 3 to 5 credits per term with up to a maximum of 8 credits in Biology and Society 499. They should enroll in Biology and Society 499 for one or both of the second quarters of their senior year, after consultation with the approval of the member of the Biology and Society faculty who has agreed to act as thesis adviser.

Students are encouraged to enroll for both terms, to give them time to properly develop a project for the thesis. Students should note, however, that Biology and Society 499, because it is a special honors course, is limited to 20 students.

Honors Thesis

Students and their advisers should meet regularly during the period of research and writing for the honors thesis. The responsibility 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. The student should be critical and constructive contovers 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 who does not complete the thesis, 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 advisers each submit 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 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 with the thesis 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 or the Biology and Society Major Office (632 Clark Hall).

General Undergraduate Courses

205 Biomedical Ethics (also Biological Sciences 205 and Philosophy 245) Fall. 3 credits. Limited to 50 students. Primarily for sophomores, juniors, and seniors; permission of instructor required for graduate students.


Critical analysis of the conceptual frameworks in which ethical problems in biology and medicine can be understood, debated, and resolved. General topics include contraception, abortion, infanticide; euthanasia and suicide; pharmacology and medical paternalism; and the allocation of scarce medical resources (both macro and micro).

206 Environmental Ethics (also Biological Sciences 206 and Philosophy 246) Spring. 3 credits. Open to sophomores, juniors, and seniors; permission of instructor required for graduate students.


Critical analysis of conceptual frameworks in which ethical problems in biology and medicine can be understood, debated, and resolved. General topics include pollution, extinction, abortion, infanticide; euthanasia and suicide; pharmacology and medical paternalism; and the allocation of scarce medical resources (both macro and micro).

232 Recombinant DNA Technology and Its Applications (also Biological Sciences 232) Spring. 3 credits. Disc. (for B&Soc registrants) limited to 20 students. Prerequisite: one year of introductory biology. S-U grades optional. There is a possible fee for reading materials.


An attempt is made to give an intelligent layperson the background needed to understand some new research discoveries and applications stemming from them. Concepts from molecular biology and molecular genetics that underlie recombinant DNA technology, together with the strategies used today in cloning genes, are discussed. Examples will emphasize the vital link between basic research, often esoteric in nature, and modern biotechnology. Applications to be discussed from multidisciplinary perspectives include insulin, interferon, bioengineering, cloning factories, growth hormones, vaccines, screening for genetic diseases, feedstock chemicals, and plant improvement. Scientific, historical, regulatory, social, and ethical issues will form the basis of the discussions.

287 History of Biology (also History 287 and Biological Sciences 201) Fall. 3 credits. Prerequisite: one year of introductory biology. S-U grades optional. Not offered 1985–86.


288 History of Biology (also History 288 and Biological Sciences 202) Spring. 3 credits. Prerequisite: one year of introductory biology. 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 Biology and Society 301) Fall. 3 or 4 credits (4 credits by arrangement with instructor). 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.

Lecs., T R 8:40-9:55. J. J. Greenwood. In modern evolutionary theory, human biology, behavior, and institutions are understood as the ongoing products of interaction between human biological evolution and cultural change. Nevertheless, numerous attempts to examine the evolutionary processes in which these products are placed are 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 attempts of evolutionary analysis to humans and develops a cultural explanation of the persistence of pre-Darwinian elements in many of them.

302 Alternative Food-Production Systems (also Biological Sciences 286) Spring. 3 credits. (4 credits by arrangement with instructor). Prerequisite: Biological Sciences 301 or permission of instructor. S-U grades optional. There is a possible fee for reading material.

Lecs., T R 12:20–1:35. Staff. Substantiation is presented for the claim that significant changes in our food-production system are needed. The inadequacies in our current system are examined from a multidisciplinary perspective, with consideration of the relevant scientific, social, public policy, and ethical issues. Current controversies on such issues as environmental protection, land use, food safety, soil conservation, chemicals in agriculture, and international food policy are considered. Emphasis is placed on developing alternatives to current practices. Lectures covering assigned readings are followed by discussion sessions.

304 Environmental Chemicals and Maladies (also Biological Sciences 304) Spring. 4 credits. Prerequisite: a biochemistry or genetics course or permission of instructor. Not offered 1985–86.

Lecs., discs, T R 10:10–11:55. J. Fessenden-Raden. Toxic chemicals as real and potential occupational and/ or environmental health hazards will be studied from a multidisciplinary perspective. A molecular biological-biochemical examination of the effects of specific chemicals as they relate to cancer and reproductive
impairments will be discussed, together with the strategies for validating risk. Scientific data and testing methodologies for mutagens, teratogens, and carcinogens, along with social, political, and ethical issues will be critically analyzed. Lectures with assigned readings will be followed by discussion sessions.

311 Professional Ethics (also History 448) Spring. 4 credits. Limited to 20 students. Prerequisite: permission of instructor. Fee for course reading material. $10. Lects, R 2:30-4:25. S. Brown. An examination of the role of professions in our society and a comparison of the ethical standards and problems of professional ethics in medicine, engineering, law, and other professions.

[312 Issues in Biology and Society: The Anthropology of Medicine (also Anthropology 312) Spring. 4 credits. Limited to 15 students. Prerequisites: Anthropology/Biological Sciences/Biology and Society 301 and permission of instructor. Not offered 1985-86, may be offered 1986-87. Lects, R 2:30-4:30. D. J. Greenwood. An examination of contemporary medical systems from an anthropological perspective and an evaluation of current approaches to the anthropology of medicine.]

327 Health and Disease (also German Literature 327 and Biological Sciences 387) Fall. 4 credits. Common Learning course. Prerequisite: permission of instructor. Limited to 20 students. S-U grades optional. Offered alternate years. Not offered 1985-86. M 1:25-3:20. S. L. Gilman.

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; Human Development and Family Studies 115 or Psychology 101, and Nutritional Sciences 115 or equivalent. Lects, MWF 1:25-2:15. J. Haas, H. Ricciuti. A review of major patterns of physical growth from the fetal period through adulthood, with consideration of biological and social-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. Credit to be arranged. Hours to be arranged. Staff.

386 Culture and Human Disease (also Anthropology 386) Fall. 4 credits. Prerequisites: one biology and one anthropology course. Lects, MWF 10:10. M. LaVeille. Explores the interrelationships between human society and the incidence of biological illness. The course focuses upon genetic and behavioral mediation of the immune system, as well as the culturally shaped epidemiology of parasitism, zoonoses, chronic disease, and disorders of undernutrition, overnutrition, and aging. The sociology of disease in Southeast Asia, Asia, Latin America, and the United States will be emphasized with examples including malaria, influenza, rickets, lactose intolerance, protein-calorie malnutrition, diabetes, cancer, obesity, substance abuse, anorexia, osteoporosis, hypertension, and heart disease.

[401 Seminar in the History of Biology (also History 447) Fall. 4 credits. Not offered 1985-86. W. Provine.]

402 Senior Seminar: The History of Biology (also History 448) 4 credits. T 1:20-4:30. W. Provine. This course examines the persistent controversies in evolutionary biology in relation to historical and cultural settings. Among the controversies are continuity versus discontinuity and the evolutionary process, adaptive versus nonadaptive change, and units of selection. The relations of evolutionary biology to Marxism, religion, and ethics are among the issues to be explored.

403 Introduction to Public Health (also Human Services Studies 469) Fall. 4 credits. Prerequisite: permission of instructor. S-U grades optional. Possible fee for reading material. Lects, MWF 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 public welfare health policies and programs. Case studies are used to apply principles and concepts from readings and lectures.

[404 Human Fertility in Developing Nations (also Population Studies 301) Fall. 4 credits. Prerequisite: Sociology 230 or permission of instructor. Offered alternate years. Not offered 1985-86. Lects, W 3:30-6. J. M. Stycos.]

408 Agriculture, Society, and Biotechnology (also Rural Sociology 408) Spring. 3 credits. Prerequisites: two courses in the social sciences and one in the biological or agricultural sciences. Not offered 1985-86. F. H. Buttel.

409 Social Policy and Economic Growth (also Management NBA 685) Fall. 3 credits. Lects to be arranged. R. M. Battistella. Contemporary social policy issues, such as health care, welfare services, and environmental issues, are assessed in the light of industrial and postindustrial priorities. The construction of a multidisciplinary analytical framework for understanding and coping with complex policy issues is a leading objective of the course.

411 Senior Seminar: The Human and Ecological Consequences of Nuclear War (also Peace Studies 402) Fall/404 Spring. 4 credits. Prerequisite: permission of instructor. Lects, hours to be arranged. M. Harwell. This course examines the most serious environmental problem facing humanity today: the consequences of nuclear war. The immediate, direct effects on humans (from blast, thermal radiation, and ionizing radiation) will be considered, along with the longer-term, indirect effects. These will include ecological impacts on climate, associated with a nuclear winter; the effects of ozone depletion, local and global fallout, genetic alterations, ecosystem imbalances, and other mechanisms. The first part of the course will consist of lectures and discussions from selected readings, quantifying the effects in the immediate and intermediate time scales. The remainder of the course will involve a group study of the long-term effects on the environment and on humans.

412 Senior Seminar: Agriculture, Society, and the Environment (also Agriculture and Life Sciences 469 and Biological Sciences 469) Spring. 3 credits. Prerequisite: one year of introductory biology or permission of instructor. Lects, T 12:20-1:25, M 1:25-10:10, and by arrangement. D. Pimentel and staff. This course stresses 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, rural 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.

[414 Population Policies (also Sociology 531) Spring. 4 credits. Prerequisite: graduate standing or permission of instructor. Offered alternate years. Not offered 1985-86. Lects, W 2:30-4:30. J. M. Stycos.]

426 Medicine and the Law Spring. 4 credits Prerequisites: Biology and Society 301 or 311 or permission of instructor. Letter grades only. There is a possible fee for copying charges. Lects, MWF 2:30. L. Palmer. The role of law in modern medicine (and the related biomedical sciences) will be examined from the perspective of the social functions of law and medicine. A number of policy and ethical issues will be considered, including the role of hospitals and other health organizations in physician-patient interactions, the social aspects of physician-patient interactions, the effect of medical malpractice on health-care delivery, and legal issues in the care of the newborn and health-care decisions for incompetents and terminally ill patients.

459 Senior Seminar: Chemicals, Risks, and Values Fall. 3 credits. Prerequisites: Biology & Society 304, Biological Sciences 304 with a grade of B--or better and permission of the instructor. Sem, T 2:30-4:25. J. M. Fessenden-Raden. Selected cases of chemical risk management by government agencies, industries, and individuals will be reviewed in the context of the generation, use, and presentation of scientific data and information for decision making. The role(s) of social, economic, political, legal, and ethical factors in risk management will be discussed. Readings from the various disciplines, including scientific papers and reports, will provide background for class discussions. A major research paper is required. This course can be used to fulfill the requirement for a senior seminar.

499 Honors Project Fall or spring. Credit to be arranged. Open only to biology and society honors students in their senior year.

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, society, culture, and art 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 adviser from the faculty members listed above. 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, 256-3386
The College Scholar program is described in the introductory section, p. 99.
The requirements for a program of study in human biology are designed to insure sufficient background in physical sciences for 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—102 plus 103—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 (Biology 228); one course in cell biology (Biology Sciences 330 or 331); two semesters of physics (Physics 207—208 or 112—213—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 should consult their faculty adviser in Human Biology for help in selecting appropriate courses.

Elective courses should be taken that will 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 should 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 or 4 credits.

Psych 425 Brain and Behavior Fall. 3 or 4 credits.

Vet M 331 Medical Parasitology Fall. 2 credits.

Human Behavior

Anthr 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 424 Animal Social Behavior Spring. 3 credits.

HDFS 212 Early Adolescence: 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

Anthr 101 Introduction to Anthropology: Biological and Prehistoric Perspective Fall. 3 credits.

Anthr 203 Early People: The Archaeological and Fossil Record (also Archaeology 203) Fall. 3 credits.

Anthr 214 Humankind: The Biological Background Spring. 3 credits.

Anthr 375 Ecology and Human Food Production Fall. 4 credits.

Anthr 380 Food, Feasts, Fasts, and Faminities: Studies of Culture and Human Nutrition Fall, Spring. 4 credits.

Anthr 386 Culture and Human Disease (also Biology and Society 386) Fall. 4 credits.

Anthr 476 Human Nature: An Evolutionary Perspective Fall. 4 credits.

Anthr 677 Topics in Ecological Anthropology: Food Production and Social Organization Spring. 4 credits.

Bio S 261 General Ecology Fall or spring. 3 credits.

Bio S 262 Ecology Environment and Society Spring. 3 credits.

Bio S 275 Human Biology and Evolution Fall. 3 credits.
government, economics, history, anthropology, rural sociology, nutrition, modern languages and literatures, international comparative labor relations, and many others too numerous to list and keep current.

The Concentration

R. Rosecrance, director, Center for International Studies, 160 Uris Hall

The purpose of a concentration is to provide a structure for students who have a general interest in the field of work plan to specialize in careers in international law, economics, agriculture, foreign trade, international banking, government service, international organizations, or another cultural or scholarly activity. Some students will major in one of the traditional departments: history, government, economics, foreign literature, and so on. Others will design an independent major. Still others will major in a different discipline, perhaps altogether unrelated, but would like to have a basic understanding of international problems.

For students in any of these categories, the requirements for a concentration in international relations are the following six courses or options:

1. Government 181, Introduction to International Relations
2. One appropriate 300-level government course, either in international relations or in the foreign policy of a particular nation
3. Economics 361, International Trade Theory
4. Economics 362, International Monetary Theory
5. History 314, History of American Foreign Policy II
6. Any history course dealing with a modern nation, particularly History 379, War and Society: the Origins of the First World War, 1870–1919

*Numbers 3 and 4 can be replaced by choosing two courses from the following:

a) Economics 371, Public Policy and Economic Development
b) Economics 372, Applied Economic Development
c) Economics 373, International Specialization and Economic Development
d) Economics 374, National and International Food Economics

The typical choices among the sequences listed above would be to study European history and government with Economics 361–362 or Third World history and government with Economics 371–374. Reasonable substitutions can also be arranged.

Students are also urged as strongly as possible to acquire full proficiency in a modern language, or at least to maintain sufficient acquaintance with a modern foreign language. At least a semester of study abroad is advised.

Students electing the international relations concentration will be assigned an adviser in that field, if appropriate, in addition to their departmental adviser. They should see Professor Richard Rosecrance, Center for International Studies, 160 Uris Hall.

Center for International Studies

See "Interdisciplinary Centers and Programs," p. 10.

Program of Jewish Studies

S. Katz, director and undergraduate adviser (Near Eastern and Jewish history and religion), S. Bacharch (industrial and labor relations, sociology, Jewish thought and social theory), M. F. Collins (Bible, Dead Sea Scrolls, apocryphal and rabbinic literature), W. J. Demnhauser (Jews and Germans, contemporary Jewish thought, Gerashom 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 industrial society, and the Middle East), D. Menasch (Shiloh Visiting Professor), D. I. Owen (Near Eastern and ancient Jewish history), D. S. Powers (history of Jews in Islamic lands), E. Rosenzweig (Jews in modern European and Anglo-American literature), N. Scharf (Hebrew language)

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 Tanachic 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 1985–86

Elementary Modern Hebrew I and II (Near Eastern Studies 101–102)

Elementary Classical Hebrew (Near Eastern Studies 121–122)

Society, Economy, and Religion in Ancient Israel: King David's Jerusalem (Near Eastern Studies 126)

Introduction to Near Eastern Civilization (Near Eastern Studies 198) Spring

Intermediate Modern Hebrew (Near Eastern Studies 201–202)

Masterpieces of Jewish Literature (Near Eastern Studies 204 and Comparative Literature 204) Spring

Readings in Classical Hebrew Literature: The Art of Biblical Narrative (Near Eastern Studies 221) Fall

The Holocaust: European Jewry, 1933–1945 (Near Eastern Studies 241) Spring

The History and Archaeology of Ancient Israel to 450 B.C.E. (Near Eastern Studies 243) Spring

Introduction to Classical Jewish History (Near Eastern Studies 248) Fall

Introduction to Modern Jewish History (Near Eastern Studies 249) Spring

Women in the Hebrew Bible (Near Eastern Studies 292 and Women's Studies 292) Fall

Modern History of the Middle East: Changing Politics, Society, and Ideas (Near Eastern Studies 294 and Government 358) Fall

Elementary Akkadian (Near Eastern Studies 333–334)

Anti-Semitism in Germany and the Jewish Response (Near Eastern Studies 349 and German Language 349)

The History and Archaeology of Ebla (Near Eastern Studies 362) Summer

Introduction to Field Archaeology in Israel (Near Eastern Studies 364) Summer

International Trade, Market, and Politics in the Ancient Near East (Near Eastern Studies 463 and Society for the Humanities 425) Fall

Bio S 301 Biology and Society: The Biocultural Perspective Fall 3 or 4 credits.

Bio S 371 Human Paleontology Spring 4 credits.

Bio S 376 Organic Evolution Spring 4 credits.

Bio S 468 Systems Ecology Fall 4 credits.

Bio S 481 Population Genetics Spring 4 credits.


B&Sac 404 Energy and Ecological Systems Fall 3 credits.

Psych S 326 Evolution of Human Behavior Fall 4 credits.

Soc S 430 Social Demography Spring 4 credits.

Soc S 431 Techniques of Demographic Analysis Fall 4 credits.

Vet M 331 Medical Parasitology Fall 2 credits.

Vet M 664 Introduction to Epidemiology Fall 3 credits.

Independent Major Program

Dean Lynne Abel, director, 55 Goldwin Smith Hall, 256-3288

The Independent Major Program is described in the introductory section, p. 99.

351 Independent Study Fall or spring 1–4 credits. Prerequisite: permission of the program office.

499 Honors Research Fall or spring 4–8 credits; a maximum of 8 credits may be awarded for honors research. Prerequisite: permission of program director. Each participant must submit a brief proposal approved by the honors committee.

Intensive English Program

E. J. Beukenkamp, director

This full-time, noncredit, non-degree program is designed to meet the requirements of foreign students who need to acquire proficiency in English in order to pursue 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 are already 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. U.S.A. Application materials and information are available directly from the program or by calling 607/256-4863.

International Relations

One of the University's strongest, most diverse fields is international relations. Cornell offers dozens of courses, in many departments and several colleges, that provide a strong education in the field, including courses in
Independent Study, Undergraduate Level (Near Eastern Studies 491–492)

Independent Study Honors Seminar (Near Eastern Studies 499)

Independent Study, Graduate Level (Near Eastern Studies 691–692)

Courses Not Offered 1985–86

Elementary Modern Hebrew (Near Eastern Studies 103) Summer.

Introduction to the Turkish Language (Near Eastern Studies 131–132)

Elementary Yiddish (Near Eastern Studies 171–172)

Masterpieces of Jewish Literature (Near Eastern Studies 205 and Comparative Literature 205)

Modern Hebrew Literature in Translation (Near Eastern Studies 207–208)

Readings in Classical Hebrew Literature (Near Eastern Studies 222)

Judaic Literature in Late Antiquity (Near Eastern Studies 225)

Aramaic (Near Eastern Studies 238)

The Emergence of the Modern Jew: 1648–1948 (Near Eastern Studies 245)

Introduction to Biblical Archaeology (Near Eastern Studies 263)

Ancient Seafaring (Near Eastern Studies 261 and Archaeology 275)

Women in Jewish Literature: Tradition and the Literary Imagination (Near Eastern Studies 291 and Comparative Literature 291)

Advanced Modern Hebrew II (Near Eastern Studies 301–302)

Seminar in Modern Hebrew Literature: The Short Story (Near Eastern Studies 303)

Seminar in Modern Hebrew Literature: The Novel (Near Eastern Studies 304)

Undergraduate Seminar in Biblical Literature: Prophecy in Ancient Israel (Near Eastern Studies 322)

Ancient Near Eastern Literature (Near Eastern Studies 332)

Readings in Akkadian Texts (Near Eastern Studies 335)

Readings in Akkadian Texts: Nuzi Dialect (Near Eastern Studies 336)

Ugaritic (Near Eastern Studies 337)

Special Topics in Near Eastern Studies (Near Eastern Studies 341–342)

The Jewish Community throughout History (Near Eastern Studies 343)

Age of the Patriarchs (Near Eastern Studies 344)

Jews of Arab Lands (Near Eastern Studies 346)

Interconnections in the Eastern Mediterranean World in Antiquity (Near Eastern Studies 361)

The History and Culture of Ancient Mesopotamia (Near Eastern Studies 363)

History of the Ancient Near East in Biblical Times (Near Eastern Studies 365)

The History and Archaeology of the Ancient Near East (Near Eastern Studies 366 and Archaeology 310)

The History and Archaeology of Ancient Egypt (Near Eastern Studies 367)

Yiddish Literature in Translation (German Literature 350 and Near Eastern Studies 373)

The Shtetl in Modern Yiddish Fiction in English Translation (German Literature 375 and Near Eastern Studies 375)

Topics in Yiddish Literature (German Literature 377 and Near Eastern Studies 377)

Jewish Workers in Europe and America 1789–1948 (Industrial and Labor Relations 381 and Near Eastern Studies 381)

Seminar in Syro-Palestinian Archaeology: The Israelite Conquest of Canaan (Near Eastern Studies 461)

Latin American Studies


The Latin American Studies Program encourages and coordinates faculty and student interests in Latin America. A variety of special lectures, films, and seminars supplement the regular course offerings. Undergraduate students may arrange an independent major in Latin American studies, and graduate students may pursue a minor in Latin American studies while majoring in the graduate field of their choice. The College of Arts and Sciences offers Latin American studies courses in anthropology, economics, government, history, and sociology. In addition, there is a varied language, literature, and linguistics curriculum in Spanish, Portuguese, and Quechua. The student may also pursue Latin American studies in the College of Agriculture and Life Sciences, the College of Architecture, Art, and Planning, the College of Human Ecology, and the School of Industrial and Labor Relations.

For further information students should contact the program office, 190 Uris Hall.

Law and Society

S. Jasanoff, director, 632 Clark Hall, 256-3810 (science, technology, and society), C. Bohmer (sociology), C. Carmichael (comparative literature), C. Greenhouse (anthropology), G. Hay (economics), C. Holmes (history), M. Katzenstein (government), D. B. Lyons (philosophy), R. Miller (philosophy), M. B. Norton (history), R. Polenberg (history), D. Powers (Near Eastern studies), J. Rabkin (government), L. Scheinman (government)

The Law and Society Program offers an interdisciplinary concentration for undergraduates who are interested in the law from the perspectives of the social sciences and the humanities: anthropology, comparative literature, economics, government, history, philosophy, psychology, science, technology and society, and sociology. In addition, undergraduates in the College of Arts and Sciences can major in law and society through the College Scholar or Independent Major Programs. Students who wish to graduate with a concentration in law and society should contact the
director of the program or one of the advisers listed above to plan a coherent program of study. Such a program should ordinarily include at least four courses from the following list. Other courses may be substituted with the approval of the adviser.

[Anthropology 228 Law and Culture Not offered 1985–86.]

[Anthropology 329 Power and Culture Not offered 1985–86.]

Anthropology 627 Legal Anthropology

[Classics 340 Ancient Greek Constitutions Not offered 1985–86.]

[Comparative Literature 326 Christianity and Judaism Not offered 1985–86.]

Comparative Literature 427 Seminar on Biblical Law

Economics 304 Economics and the Law

Economics 354 Economics of Regulation

Government 313 The Nature, Functions, and Limits of Law


Government 327 Civil Liberties in the United States

Government 328 Constitutional Politics: The United States Supreme Court


Government 389 International Law


Government 428–429 Government and Public Policy: An Introduction to Analysis and Criticism


History 275 Crime and Punishment: From the Puritans to Mickey Spillane

[History 318 American Constitutional Development Not offered 1985–86.]

[History 367 Church and State during the Middle Ages Not offered 1985–86.]

History 421 Constitutionalism as a Cultural Problem in America

History 430 Law and Authority in American Life

Near Eastern Studies 357 Islamic Law and Society

Philosophy 319 Philosophy of Marx

Philosophy 342 Law, Society, and Morality (also Law 666)

Philosophy 444 Contemporary Legal Theory (also Law 729)
102 King Arthur and His Knights  Fall or spring. 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 Christien 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 Silvestri's Cosmographia, Lais of Marie de France, Arthurian romances, or Dante's Inferno. The second half of 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 1985–86.

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 Office of Medieval Studies 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 adviser in the area of concentration. The program is administered by a committee. The chairman is Professor Kretzmann, 777 Goldwin Smith Hall.

Courses in religious studies currently offered include the following:
Asian Studies 104 Three Ways of Thought 3 credits.
T. L. Mei.
Asian Studies 250 Introduction to Asian Religions  Fall. 3 credits.
Staff.
Asian Studies 351 The Religious Traditions of India  Fall. 4 credits.
B. Faure.
Asian Studies 352 East Asian Buddhism  Spring. 4 credits.
B. Faure.
Asian Studies 650 Topics in Asian Religion  Spring. 4 credits.

Comparative Literature 328 Literature of the Old Testament  Fall. 4 credits.
C. Carmichael.

Comparative Literature 426 New Testament Seminar  Fall. 3 credits.
C. M. Carmichael.

Comparative Literature 427 Biblical Law  Fall. 4 credits.
C. Carmichael.

Comparative Literature 429 Readings in the New Testament  Spring. 4 credits.
J. Bishop.

History 268 A History of Rome from Republic to Holy City  Spring. 4 credits.
B. Strauss.

History 308 Reformation Europe 1450–1650  Fall. 4 credits.
R. Hsia.

History 346 Religion in American History  Spring. 4 credits.
R. L. Moore.

History 365 Medieval Culture 400–1150  Spring. 4 credits.
J. John.

History 469 Seminar in the Reformation  Spring. 4 credits.
R. Hsia.

Near Eastern Studies 126 Society, Economy, and Religion in Ancient Israel: King David's Jerusalem  Spring. 3 credits.
D. Oxen.

Near Eastern Studies 221 Readings in Classical Hebrew Literature: The Art of Biblical Narrative  Fall. 3 credits.
M. Collins.

Near Eastern Studies 243 History and Archaeology of Ancient Israel  Spring. 4 credits.
D. Owen.

Near Eastern Studies 292 Women in the Hebrew Bible (also Women's Studies 292) Fall. 3 credits.
M. Amihai Collins.

Freshman Seminars
101 The Legendary Figures and Fantastic Worlds of Medieval Literature  Fall or spring. 3 credits.
Hours to be arranged. Staff.
The legendary figures and fantastic worlds of medieval literature have entertained audiences throughout the centuries. Readings in English translation will explore 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.
Philosophy 213 Existentialism Fall. 4 credits.
A. Wood.

Philosophy 214 Philosophical Issues in Christian Thought Spring. 4 credits.
N. Kretzmann.

Philosophy 215 Medieval Philosophy Fall. 4 credits.
N. Kretzmann.

Philosophy 263 Religion and Reason Fall. 4 credits.
N. Kretzmann.

Society for the Humanities 412 Understanding African Thought Spring. 4 credits.
A. Appiah.

Society for the Humanities 415 Western Discovery of Taoism and Zen Buddhism Fall. 4 credits.
B. Faure.

Russian and Soviet Studies Major
W. Browne, chairperson; M. G. Clark, G. J. Staller, J. Sweeney, J. Varone (economics); M. Rush (government); W. M. Pinter (history); W. W. Austin (music); U. Brondenbriner (psychology); P. Carden, C. Emerson, G. Gibling, 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 Russian 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 Pinter 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.

Social Relations Major
W. W. Lambert, director of undergraduate studies, 238 Urs Hall, 256-6390

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 260 or Sociology 260; 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. Ordinarily 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 485).

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 1985–86: Anthony Appiah (Yale University), Philip Bohman (University of California at Berkeley), Bruce Mazlish (Columbia University), Carlos Fuentes (Harvard University), Barbara Harlow (University of Texas, Austin), Victor Koschmann (Cornell University), Uday Mehta (Princeton University), Giovanni Pettinari (Università degli Studi di Roma), Jamil Rager (Hadassah University); Wole Soyinka (University of Ife, Nigeria), Gayatri Chakravorty Spivak (Emory University), Alan Wolfe (University of Oregon)
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 only oral reports or, in addition, a research paper. Students wishing 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 focal theme during the 1985–86 year will be Non-European Traditions in Western Civilization.

101 Science as Literature: The Profession of Science Fall or spring. 3 credits. Freshman Seminar Fall: M W F 9:05; spring: T R 10:10. J. Lumley. Robert Ornstein 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 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. 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 geoecentric, 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.

381–382 The Content and Form of Iroquois Diplomacy in Colonial America (The Frederick G. Marcham Seminar) (also History 381–382) 381, fall; 382, spring. 4 credits each term. Permission of instructor required.


Through the American Revolution the League of Iroquois Nations exerted a great political influence upon colonial and tribal relations in the Northeast. To the recorded speeches and related records from the Iroquois’ hundreds of treaties with French and English colonies, historians and anthropologists have applied different kinds of evidence: history, law, and history has concentrated on the conflicts and other events surrounding the diplomacy, while anthropology has extracted ethnographic information about Iroquois social and political organization. But the voluminous texts of Iroquois treaties, only recently collected on microfilm from many archives in Europe and North America, also invite closer analysis of the dynamic rituals and symbols used by Indian nations and European colonies over the seventeenth and eighteenth centuries. This seminar will explore approaches for studying the language and ceremony of Iroquois diplomacy—as both documented in treaty records and perpetuated by the Iroquois people themselves. Classic treatments of these sources by anthropologists and historians will be examined, and students will explore detail selected texts and traditions from Iroquois diplomacy.

412 Understanding African Thought Spring. 4 credits.
M 12:30–2:15. A. Appiah.
A study of alternative approaches to understanding traditional African modes of thought. Beginning with key texts in the history of African “ethno-philosophy”—Placide Temepsi’s Bantu philosophy and Evans-Pritchard’s Witchcraft, oracles and magic among the Azande—and ending by examining in some detail a corpus of proverbs from the Akan peoples of Ghana.

413–414 The Impact of Non-Western Music on Musical Scholarship, ca. 1750 to the Present (also Music 781–782) 413, fall; 414, spring. 4 credits each term.
The rise of modern musical scholarship was coeval with a growing understanding of non-Western music. This seminar will examine the ways in which non-Western music has been both an object of study and a significant influence in musicology and ethnomusicology. Seminar topics will include historical concerns, persistent modes of investigation derived from an awareness of non-Western cultures, and the roles of other disciplines in fostering modern musical scholarship. The first semester will include a period culminating early in the present century; the second semester will extend the investigation to the present. Students may enroll in either semester or both.

415 The Western Discovery of Taoism and Zen Buddhism Fall. 4 credits.
T 2:30–4:15. B. Faure.
This seminar will attempt to retrace the history of the Western encounter with the traditions of Taoism and Ch’an (Zen) Buddhism and to analyze the ideological implications of their reception. It will consider the influence of different modes of thought such as the literary, theological, and psychoanalytical traditions.

418 Contemporary Spanish America: Historical Origins and Cultural Context (also Spanish 493) Spring. 4 credits.
W 2:30–4:15. C. Fuentes.
Many things happening in the Latin-American world today began with the discovery, conquest, and colonization of, or in some cases before, the discovery of the New World. By studying the acts of foundation, the presence of the West in the New World and the assimilation and deformation of European values in the Americas, we will address both the grander thematic question of the encounter between the West and societies that are and are not Western and the more contemporary question of contextual interpretation of contemporary events. Readings include such founding texts of the Renaissance and of the invention of the New World as Bernal Diaz’s Conquest of New Spain,
Machiavelli's "The Prince," Erasmus's "The Praise of folly," and Thomas More's "Utopia." Discussion of such topics as revolution, models of development, Latin America's position in the international community, the development of a Latin American contribution to international law, the persistence of the "third world" in each Latin American republic, and the obstacles to change in the light of the founding events, the cultural traditions, and the intellectual disturbances of the continent.

419 Third World Literature: Middle East, Africa, and Latin America
Fall. 4 credits.
T 12:30–2:15. B. Harlow.

Throughout the ages, novels, short stories, and poetry from the Middle East, Africa, and Latin America, the significance of the literary and cultural developments in these areas will be examined. Discussion will be organized around a set of issues relevant to the contemporary situation in the Third World: colonialism, nationalism, and the novel; resistance poetry; and women writers. Readings will also include essays of a critical and theoretical nature, and an effort will be made to situate these literary productions in their historical and political context.

421 The Role of Asia in Modern European Diskourse on History and Subjectivity (also History 490)
Fall. 4 credits.
W 12:30–2:15. J. V. Koschmann.

Integral to modern European philosophies of history and of the human subject is an image of Asian societies (or the "Orient") as static and despotic. Hegel posited China as the "childhood of history," a land where "nothing subjective is recognized." Marx tried to account for the apparent unimportance of historical change in India by developing the model of an "Asianic mode of production," and Max Weber searched in vain through Chinese religion and ethics for an analogue to the Protestant ethic. However, we will consider the Hegelian, Marxian, and Weberian theses in detail and then turn for comparison to some more recent Western constructs of East Asia. Along the way, we will critically reflect upon the epistemological and ideological foundations of cultural Orientalism in the West; the issue of cultural universalism versus relativism in social science, and the relationship between theories of history and the practice of imperialism.

422 Japan and Modernity: A Special Case of Orientalism
Spring. 4 credits.

Contemporary Japan is the latest in the line of Western member of the elite of powerful capitalist nations, has posed a challenge to conceptual schemes of world development, whether Marxist or counter-Marxist (e.g., modernization theory). The Japanese challenge is also reflected, however, in the struggle of intellectuals and artists to theorize and express a Japanese consciousness that is neither "oriental" nor Orientalist. This seminar will focus on the products of philosophers, writers, and filmmakers who have engaged in this struggle. Topics to be considered include the impact of Western philosophy on the Kyoto School of religious thought, existentialism and Marxism in postwar Japan; and suicide, sex, and humor in modern Japanese literature and film.

423 British Liberalism in Nineteenth-Century India
Fall. 4 credits.

This seminar will consider the way in which India configured the theoretical imagination and political principles of a number of noted British political authors of the nineteenth century. The primary focus of the seminar will therefore be to study these authors and their texts but not with the ideology and practice of British colonialism per se. Indeed, one of the remarkable facets of the British liberals in the nineteenth century is the extent to which they viewed India as the perfect laboratory for the testing and validating of a variety of familiar nineteenth-century liberal concerns. The primary readings will be drawn from Burke, Bentinck, the Mills, Lord Macaulay, Thomas Carlyle, the Trevelyan, and Walter Bagehot.

425 International Trade, Market, and Politics in the Ancient Near East (also Near Eastern Studies 463)
Fall. 4 credits.
R 2:30–4:15. G. Pettinato.

A seminar on the dynamics of international trade, based on the study of international treaties, economic sources, and archaeological evidence. Factors such as political conditions, market forces, and sources of raw materials and manufactured goods and their relationship to the development of treaties will be evaluated and discussed. Parallels will be drawn with developments in more recent periods in both the Near East and Western Europe.

427 Eastern and Western Science: Is Science a Western Phenomenon?
Fall. 4 credits.

A widely held opinion about science is that it began somewhat mysteriously with the Greeks, had a hiatus from about 500 A.D. until 1500 A.D., and then resumed in Europe its glorious path uninterrupted to the present day. Although the positivist tone of this account has been strongly challenged, the idea that science is European (or "Western") has been less so. In this seminar we will not only attempt to evaluate the contributions of non-Western civilizations (especially Islam) to Western science but, perhaps more importantly, try to gain a broader understanding of the concept of science by seeing it in the context of other cultures.

428 Genre Theory and Black Literatures
Spring. 4 credits.
R 2:30–4:15. A. Porter.

The seminar will explore the personal development as genre in Africa and the African Diaspora. After introducing the problem of genre in literature, we will read some European antecedents of the novel of personal development before turning to African, Afro-American, and Caribbean examples. Authors may include Richard Wright, Mongo Btol, Ferdinand Oyono, George Lamming, Michael Anthony, Legson Kayira, Camara Laye, Ngugi wa Thiong'o, Buchi Emecheta, Toni Morrison, Ben Okri, and Efski Maheshle.

429 African Thought in Literature and Art
Fall. 4 credits.

The comparative thought-systems of selected African societies and their reflection in both traditional and contemporary arts and literature, secular and religious, will be explored. The African thought-systems contrast with the linear—how integral is the former to African society in general, and how relevant still (and effective) in their social and economic relations? The debate on African aesthetic and philosophical systems will be reviewed, and/or resistance to, Western and Islamic encounter. Examples of social strategies to safeguard the organic essence of the community and their consequences on the intruding cultures, such as a lasting syncretism of both art forms and religious symbols. The study will conclude with the conscious search by contemporary thinkers and artists for a contemporary philosophy as an instrument of countering the alienating aspects of Western social systems.

430 Literary Criticism and the Critique of Imperialism
Spring. 4 credits.

Through an analysis of social and verbal texts, this seminar will investigate why and how a study of the imperialist moment is necessary for consideration of literary and theoretical production in the West. Readings will include Western literary and philosophical texts (Jane Austen, Mary Shelley, Jean Rhys, Barbier de Meyran, Maxime Chattam, Deleuze/Guattari) as well as some Indic material (Sanskrit legal and scriptural texts, twentieth-century Bengali texts in translation).

433–434 Guided Reading
433. Fall; 434. Spring.
2 credits each term.
Staff.

435–436 Guided Research
435. Fall; 436. Spring.
4 credits each term.
Staff.

South Asia Program


The South Asia Program coordinates research, teaching, and special campus events for Bangladesh, India, Pakistan, Nepal, 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 South Asia and/or resistance to, Western and Islamic encounter.

South Asia studies at Cornell is included within the framework of the Department of Asian Studies. Sixteen full-time faculty members in the Colleges of Arts and Sciences, and Agriculture, Asian studies with a South Asian concentration. The languages regularly offered are Bengali, Hindi, Nepali, Sinhala, Tamil, Telugu, Urdu, Sanskrit, and Pali. Cornell is a class A member of the American Institute of Indian Studies (AIIS), and undergraduates as well as graduate students are eligible for AIIS intensive language program fellowships in India. For courses offered in South Asian studies and details on the major, see the Department of Asian Studies listing in this volume. Students wishing further information on courses and research opportunities should direct questions to the program office, 170 Uris Hall.

Southeast Asia Program


Southeast Asia studies at Cornell is included within the framework of the Department of Asian Studies. Sixteen full-time faculty members in the Colleges of Arts and Sciences, and Agriculture, Asian studies with a South Asian concentration. For courses offered in Southeast Asian studies and details on the major, see the Department of Asian Studies listing in this volume. Students wishing further information on courses and research opportunities should direct questions to the program office, 170 Uris Hall.

Undergraduate Research Program

Marilyn Williams, director, 135 Goldwin Smith Hall, 256-8380

The Undergraduate Research Program is described in the introductory section, p. 99.
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 teaching about women and sex roles for women and men; to examine assumptions about women in various disciplines and to develop systems to integrate back into the disciplines new knowledge about women; and to cooperate in public service activities with the extension divisions of the University.

The program is guided by a board composed of faculty and staff at Cornell and members of the Cornell and Ithaca communities who have an 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 Science desiring 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 biweekly noncredit seminar/study group for 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 a concentration. In collaboration with that advisor, students will design a coherent program in women's studies to complement their major. Before graduation students will submit to their advisor 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 (see 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 advisor.

For further information or to meet with the director of undergraduate studies to select an advisor, students should contact the Women's Studies Office, 332 Uris Hall, 256-6480.

Distribution Requirement

Distribution requirements are satisfied by any two Women's Studies courses in any of the following categories.

Social Sciences: (a) any two of 238, 244, 277, 321, 353, 365, 422, or (b) any one of 110, 365, 493, plus one from list a.

History: any two of 227, 238, 326, 363.

Humanities: (a) any two of 248, 249, 251, 348, 399, 451, 453, 456, 467, 476, or (b) any one of 110, 365, 493, plus one from list a.

Courses

Maintaining 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, 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 cooperation 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

104 Women and Social Transitions in the Twentieth Century (also Asian Studies 101) Spring. 3 credits. Not offered 1985–86.

207 Gender and Society (also Sociology 207) Fall. 3 credits. Not offered 1985–86.

105 Feminine and Masculine Ideals in Japanese Culture (also Asian Studies 105) Fall. 3 credits. Not offered 1985–86.

106 Women and Writing (also English 105) Fall and spring. 3 credits.

208 Language and the Sexes (also Linguistics 208) Fall. 3 credits. Not offered 1985–86. S. McConnell-Ginet.

271 Sociology of Gender (also Sociology 271) Fall. 3 credits. Not offered 1985–86. S. Oizkra.

277 Psychology of Sex Roles (also Psychology 277 and Sociology 277) Spring. 3 or 4 credits. Prerequisite: an introductory psychology course.

II. General Courses

110 Introduction to Women's Studies Fall. 3 credits. Limited to 25 students. T R 2:30–4:25. 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. Lect. 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 for sophomores 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.

244 Language and the Sexes (also Linguistics 244) Spring. 4 credits. Not offered 1985–86. S. McConnell-Ginet.

271 Sociology of Gender (also Sociology 271) Fall. 3 credits (4-credit option available). Not offered 1985–86. S. Ozikra.

An analysis of the structure of gender roles in America and other societies. This course will examine theories and research on sex differences and on consequences of stratification by sex. We will examine the intersection of work and household roles of men and women, including analysis of changes in recent decades. Finally, to uncover the structural sources of the feminist movement, we will examine the mobilization of women in America and elsewhere.

277 Psychology of Sex Roles (also Psychology 277 and Sociology 277) Spring. 3 or 4 credits. Prerequisite: an introductory psychology course.

321 Sex and Gender in Cross-Cultural Perspective (also Anthropology 321) Fall. 4 credits.


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.
Women in the American Society, Past and Present (also History 326)
Spring, 4 credits.
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.

Feminist Movement and Public Policy (also Government 353)
Fall, 4 credits. Not offered 1985–86.
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 political 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.

231 Power and Marginality: Women in the Third World
Fall. 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. Among the contemporary theories of development and feminism, using case studies from different cultures to clarify the political, economic, and ideological interconnections between First and Third World nations.

238 The Historical Development of Women as Professionals, 1800–1980 (also Human Development and Family Studies 258)
Spring, 3 credits. Students in endowed units must register for Women’s Studies 238.
The historical evolution of the female professions in America (medicine, 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 notion of gender-specific work and the particular historical circumstances that created these different work opportunities. The evolution of professionalization and the consequences of professionalism for women, family structure, and American society are also discussed.

248 Major Nineteenth-Century Women Novelists (also English 247)
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 a variety of minor 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; Galsworthy, The Forsyte Saga; 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.

251 Twentieth-Century Women Novelists (also English 251)
Fall, 4 credits.
M W F 1:25. M. Hite.
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.

265 Black Women and Their Fictions (also English 265)
Spring, 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 the social world? How does their writing resemble or diverge from the black male tradition? How does black feminist theory differ from white feminist theory? These are the concerns of this class. Readings are by Harriet E. Wilson, Frances Harper, Anna Julia Cooper, Nelly Larsen, Zora Neale Hurston, Gwendolyn Brooks, Ann Petry, Paule Marshall, Toni Morrison, Toni Cade Bambara, Gayle Jones, Alice Walker, Gloria Naylor, and Jamaica Kincaid.

292 Women in the Hebrew Bible (also Near Eastern Studies 292)
Fall, 3 credits. Open to Freshmen. May be used for distribution requirements in the humanities or social sciences. Topics include the Jewish law and public policy on such issues as individual choice and group equality.
This course features stories about women in the Hebrew Bible. Through literary and feminist readings of these texts we attempt to understand the portrayal of women (characteristics and roles assigned by male writers); the social reality represented (sex-gender and tribal systems), the role of narrative in the promotion of patriarchal, ethnocentric, and religious ideologies; the transformation of descriptive literary features into prescriptive behavioral norms for Jewish women; and our relationship as women readers to ancient traditions that we have inherited. Topics include goddesses, witchcraft, war, power, violence, rape, foreigners, prostitutes; well-known figures include Lilith, Eve, Rahab, Deborah, Delilah, the Witch of En-Dor, Tamar, Jezebel, and Esther. All texts in English translation; Hebrew texts optional.

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 stereotyped functions 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 then trace the degree of acceptance or rejection of such an imposed image as it manifests itself in contemporary works.

348 The Female Literary Tradition: Wollstonecraft to Woolf (also English 348)
Spring, 4 credits.
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 Utopian women’s fiction at the end of the nineteenth century and to the beginnings of the twentieth-century modernist experiment by women. Texts will include works by Wollstonecraft, Austen, Tennyson, Elizabeth Barrett Browning, George Eliot, De Maupassant, Chopin, and Woolf.

355 Feminist Theory and the Challenge of Third World Feminism
Spring, 4 credits. Limited to 15 students.
This course is designed to explore the major issues in feminist theory vis-à-vis the recent challenges posed by women of color in the United States (black, Latina, Asian-American, Native American) and women from Third World countries. We will focus on five issues: the origins of patriarchy and the representation, labor (paid and unpaid), and reproduction. Each issue will be analyzed through representative readings and through contextual analysis of the political questions presented by a study of that issue (for example, the birth control movement under the issues of reproduction, and the wages-for-housework debate under the issue of labor). A close reading in the specific political questions will enable us to understand the challenges posed by Third World women within the framework of particular socio-historical contexts. The overall goal of this course is a critical knowledge of the major issues in feminist theory, as well as the development of an understanding of, and sensitivity to, the problems that arise when feminist theory speaks for all women.

363 Women in Classical Greece and Rome (also Classics 363)
Spring, 3 or 4 credits (4 credits with extra weekly session (R 12:20–1:30) reading Greek text).
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 patriarchal society, explore the experiences of women and to address general historical questions about evidence and problems in using literature and historical writing to assess social roles.

365 Directions in Feminist Theory (also Government 362)
Spring, 4 credits.
This course is designed to explore developments in contemporary feminist theory in 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.

366 Feminism, Sexuality, and the Politics of Identity (also Government 366)
Spring, 4 credits.
Not offered 1985–86.
The purpose of this course is (1) to explore the theoretical and political significance within feminism of sexuality and sexual identity, (2) to examine attempts to define the construct “lesbianism”, (3) to consider the limitations of “identity politics”, and (4) to analyze the implications of class, race, and ethnicity for a “sexual politics.”

395 Women in Revolution (also Asian Studies 395)
Fall, 4 credits.
The course will examine how the “women’s question” has been answered in nineteenth- and early twentieth-century revolutionaries, and in postrevolutionary ideology and social policy. We will study women in revolution in Russia, China, Japan and Korea to trace how socialist and anarchist feminists and revolutionaries resolved the women’s question in their writings on class, patriarchy, and sexuality in their personal lives. The focus will be on analysis of primary sources, including women’s literary classics, songs, lyrics, and legal documents will be used to determine how such revolutionary figures as Emma Goldman, Alexandra Kollontai, Ding Ling, Shuzo Itsumoto, and the Japanese textile workerUchida articulated their demands for political and sexual emancipation and how these demands were met after the revolutions.
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.

Hours to be arranged. D. Holmberg.

An anthropological consideration of witchcraft, shamanism, and the cult of spirit possession, with special attention to the play 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 general problems in the study of women and gender and the anthropology of myth, ritual, and symbolism.

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.

Hours to be arranged. S. Bern.

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. In 1985 the topic will be the development of children's thinking about gender.

453 Victorians and Modernists: Literary Legends from Wilde to Woolf (also English 453) Spring. 4 credits. Not offered 1985–86. S. Siegel

456 Edith Wharton, Willa Cather, and Eudora Welty (also English 456) Fall. 4 credits. 

T R 2:30-3:45 J. F. Blackall.


468 The Theory and Politics of Liberal Feminism (also Government 468) Spring. 4 credits. Not offered 1985–86.

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 finally, discuss programs that have to encourage critical thinking about what humanists do and how cultural conceptions of sexuality, sex roles, generational relationships, stages of life, and life events. SJudents 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.]

469 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 Executive Board.

Hours to be arranged. Staff.

625 Gender Relations and Social Transformation (also Rural Sociology 625) Fall. 4 credits. Open with permission to undergraduates.


A comparative analysis of women's contribution to domestic/household, 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.

626 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.

T 2:30–4:30 M. B. Norton.

A reading and research seminar intended primarily for graduate students. Myths of 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) Fall. 4 credits. Not offered 1985–86. I. Ezergailis.

685 Seminar in Sex Differences and Sex Roles (also Psychology 685 and Sociology 685) Fall. 4 credits. Prerequisite: permission of instructor. Not offered 1985–86. S. Bern.

IV. Related Courses and Seminars

305 Psychological Anthropology (also Anthropology 305) Fall. 4 credits. Not offered 1985–86. B. J. Isbell.

329 Race, Gender, and Politics (also Government 329) Fall. 4 credits. Open to sophomores and juniors. Limited to 5 students. Not offered 1985–86. 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 150 or one 200-level social science or history course. Students in endowed units must register for Women's Studies 357 or Sociology 359. Not offered 1985–86. J. Brumburg.

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, generational relationships, 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.

671 Readings in Contemporary Social Theory (also Government 670) Spring. 4 credits.

Hours to be arranged. S. Buck-Morss.

759 Virginia Woolf (also English 759) Fall. 5 credits. Prerequisite: permission of instructor. Not offered 1985–86. S. Siegel

Related Courses in Other Departments

Time as a Human Resource (Consumer Economics and Housing 411)

Dress: A Reflection of American Women's Roles (Design and Environmental Analysis 245)

German Women Writers of the Fin de Siècle (German Literature 754)

The Family In Modern Society (Human Development and Family Studies 150)

The Family In Cross-cultural Perspective (Human Development and Family Studies 354)

Theories of Adult Interpersonal Relationships (Human Development and Family Studies 358)

Families and Social Policy (Human Development and Family Studies 456)

Contemporary Family Theory and Research (Human Development and Family Studies 650)

Women at Work (Industrial and Labor Relations 366)

Writing Program

F. V. Bogel, director, 159 Goldwin Smith Hall 256-4061; K. K. Gottschalk, assistant director

The following courses are limited to sophomores and above; they may be used to fulfill either a distribution requirement or the Freshman Seminar requirement, but not both.

201 Writing in the Humanities (also English 286) Fall or spring. 4 credits. Prerequisite: completion of or current enrollment in a course in the humanities or expressive arts. Carries distribution credit as English 286.

S. Davis.

The course seeks to strengthen writing skills particularly appropriate for study in the humanities and to encourage critical thinking about what humanists do when they read, write, and interpret. Course members will examine and evaluate works of literature, philosophy, and visual art together with critical and historical materials on each. The course will address issues of technique in writing (audience, topic choice, organization, critical method, use of secondary materials) and raise questions about the role and justification of such techniques in the work of the humanities. A typical primary list might include Conrad's Heart of Darkness, Plato's Gorgias, Nietzsche's Birth of Tragedy, Euclides' Bacchae, Peter Weir's Film Picnic at Hanging Rock, and Velazquez's Las Meninas. Writing assignments amount to thirty to forty pages in all. Frequent individual conferences.

202 Writing in the Social Sciences (also Sociology 202) Fall or spring. 4 credits. Prerequisite: one social science course.

K. M. Firth, S. Siskin.

This course has two related objectives: to help students understand the characteristics of discourse in the social sciences and to help them write more effectively. In conjunction with writing assignments, students will examine a wide range of essays and research in fields such as anthropology, psychology, sociology, and social philosophy, paying particular attention to the ways in which specific theories, objectives, and methods affect uses of language. Students will write...
about ten papers (amounting to roughly thirty pages) and will gain experience in handling such forms as analyses, comparisons, and summaries of texts; descriptive essays; and arguments. The course will also address questions of audience, levels of abstraction, types of evidence and explanation, the uses of voice, and methods of integrating references and quotations. Instruction will include guidance at various stages of the writing process, extensive work on revision, and frequent individual conferences.

Freshman Seminar Program

Each semester of their freshman year at Cornell, most students choose a Freshman Seminar from among more than seventy-five courses offered by over twenty different departments in the humanities, sciences, social sciences, and expressive arts. These courses share one major 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. The following courses are Freshman Seminars. Since, however, Freshman Seminar offerings vary from semester to semester, the following should be considered only as representative of the kinds of courses offered in a term; for up-to-date information, students must consult the Freshman Seminar brochure available from college registrars before fall and spring registration. For more information about the Freshman Seminar Program and its requirements, see pp. 15–16.

African Studies and Research Center

For full descriptions of the following courses see "African Studies and Research Center," pp. 210–211.

137 Afro-American Writing and Expression Fall. 4 credits. A. Graves.

138 Applied Writing Methods on Afro-American Topics Spring. 3 credits. A. Graves.

171 Infancy, Family, and the Community Fall. 4 credits. W. Cross.

172 Teaching and Learning in Black Schools Spring. 4 credits. W. Cross.

203 History and Politics of Racism and Segregation Fall. 4 credits. C. Mbata.

204 History and Politics of Racism and Segregation Spring. 4 credits. C. Mbata.

231 Black Political Thought Fall. 3 credits. J. Turner.

290 The Sociology of the Black Experience Fall. 3 credits. J. Turner.

Anthropology

[121 Encounters with Other Cultures 3 credits. Not offered 1985–86. B. Lambert.]

[130 Ape's and Languages 3 credits. Not offered 1985–86.]

160 Heroes, Witches, and Rebels: Motives and Motifs of War Fall or spring. 3 credits. B. Lantz and staff.

How has war been waged throughout the world? How does history reflect back on wars? This course will investigate warfare as it has occurred in a variety of human social contexts. Our inquiry will involve two types of questions. The first set addresses issues of anthropological explanation. Are group aggression and tribal violence innate? Does warfare fulfill a social function? Is the warfare of the tribe like that of the nation-state? The second set asks how war is incorporated into the political ideologies of different societies. What are the terminologies of war in different cultural settings? How is armed conflict remembered, prophesied, dramatized, parodied? What are our own idioms of warfare, and how do they govern our understanding of world events? Writing assignments will include analytical, investigative, argumentative, and interpretive exercises.

Archaeology

105 Archaeology as Heritage Fall or spring. 3 credits. B. Lantz.

Archaeological investigation provides us with clues about our historical and cultural origins. At the same time, it reflects our very modern concerns about what sort of past we are willing to claim as our heritage. What archaeologists do often derives from these interests as well as from the concerns of science. The New World has witnessed the growth of a rich diversity of cultural and national traditions, each with its distinctive way of interpreting the past. We will examine the role of the Aztec past in Mexico, the uses of Inca heritage in Peru, and the image of Native Americans in the United States. We will also consider various vehicles for the interpretation and dissemination of historical information, such as museums, archaeological sites, and history textbooks. Readings will include the efforts of historians, archaeologists, novelists, essayists, politicians, and journalists to make sense of the past. Writing assignments will allow students to explore relationships with the past, not only from their own points of view, but also from those of the peoples of Central and South America.

107 Popular Archaeology Fall or spring. 3 credits. Not offered 1985–86. Staff.

Examines the scientific basis for controversial interpretations of prehistory that have gained wide public acceptance. Readings include both popular and scholarly works. Careful and critical analysis of archaeological evidence is emphasized.

110 The Conquest of Middle and North America Fall or spring. 3 credits. A. Wonderley.

The dramatic cultural collision of the sixteenth and seventeenth centuries is examined from Native American and European perspectives. The course synthesizes archaeological and documentary evidence relevant to aboriginal societies in Central and North America immediately before and after the conquest. Postmedieval Europe and its colonial enterprises are also considered.

Architecture

190.1 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.

190.2 The Literature of Architecture Fall or spring. 3 credits. Staff.

Students will become acquainted with three major themes of twentieth-century architecture as revealed in the testimony of the architects themselves. In the first part of the course, students will explore the tumultuous social, economic, and political conditions that form the backdrop for creative effort in the early twentieth century. The second part will deal with the needs to

met by the modern dwelling as defined by Louis Sullivan and Frank Lloyd Wright. In the last third of the course students will read defenses and descriptions of the aesthetic of modern architecture, such as The International Style by Henry Russell Hitchcock and Philip Johnson. They will then have the opportunity to consider the latter-day reaction to modern architecture through such texts as Tom Wolfe's Inland Empire From Bauhaus to Our House.

Asian Studies

104 Three Ways of Thought Fall. 3 credits. T. Mei and staff.

An introduction to Confucianism, Taoism, and Zen through reading and discussion of basic texts.

105 Feminine and Masculine Ideals in Japanese Culture Fall or spring. 3 credits. V. Skord. In its long history, Japanese culture has developed a large body of role models—the aristocratic 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 practical 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

101 Rural Life as Metaphor (also Sociology 100.8) Fall. 3 credits. S. Siskin.

102 Hard Choices (also Sociology 100.7) Spring. 3 credits. S. Siskin. Many people believe that no restrictions should be placed on the pursuit and dissemination of scientific, medical, and technical knowledge. But what if a research technique may endanger public health and safety, or published research findings can be exploited for bad ends? Are restrictions then appropriate? What form should they take? Who should decide? We will examine how such questions challenge many traditional attitudes toward knowledge and pose dilemmas for science, medicine, engineering, universities, and society. Discussion will be based on readings in drama, fiction, political philosophy, philosophy, sociology, and scientists' discussion and debate over genetic engineering.

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 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.

107 Living on the Land: Images of Rural Life in American Culture Fall or spring. 3 credits.
A. Boehm.
Americans have acquired some of their most salient characteristics as a people from their intimate relationship to the land—at least this relationship is variously perceived and promulgated as defining the national character. Yet today most Americans’ lives are a far cry from the lives of farmers, miners, and other workers who maintain an intimate contact with the land. Some would say this has centrally disturbed our individual self-images as well as the cultural image we present to the rest of the world. We will read works by sociologists, conservationists, preachers, and others, all concerned with our culture’s relationship to our land. Students from all disciplines will be invited to bring up personal considerations of the relations between self and land, between land and politics, and between politics and self.

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 our beliefs. Perspectives drawn from authors such as Hofmann, Ibsen, Kafka, Beckett, Yeats, and others exemplify a variety of literary forms—e., fiction, drama, and poetry—and provide the basis for students’ critical essays.

104 The Heroine in Literature Fall or spring. 3 credits.
Staff.
This course will focus on the concept of the heroine as it is presented in specific works. Discussion will address questions such as: What is a heroine? Is she different from a hero? To what extent is the literary concept influenced or determined by the social environment? Is the concept affected by the sex of the author? Students will write critical papers on such authors as Shakespeare, Austen, Bronte, and Woolf.

105 The Hero in Literature Fall or spring. 3 credits. Not offered 1985–86.
This course will study the portrayal of heroes in literature from various periods and cultures. Readings illustrate a variety of attitudes and literary styles—realism, idealization, grotesque or fantastic exaggeration, parody, and political engagement. Students will write critical essays on works by authors such as Sophocles, Shakespeare, Brecht, Beckett, and others.

108 Language and Politics Can language be simultaneously objective and committed? The seminar considers both the language of politics and the politics of language in the reading as well as the writing assignments. We will question the everyday distinction between the political and the apolitical, between reading and writing, and between professional writing and student writing.

108.1 (also English 107.1) Fall or spring. 3 credits.
S. Bruce.
We will focus on the ideological significance of various forms of discourse, looking both at language that is self-professedly political and at language that purports to be apolitical. We will study advertisements, newspaper articles and editorials, public speeches and political essays, the language of popular culture, and more conventional specimens of literary language. We will attempt to incorporate a “cross-cultural” view of political language, looking at the political discourse of other English-speaking cultures as well as that of the United States. Written work will consist, for the most part, of critical and argumentative analyses of the readings assigned: frequent short papers at first, and then longer essays.

108.2 Spring. 3 credits.
W. Cohen.
The focus is on the ideological significance of various forms of discourse: advertisements, newspaper articles and editorials (a basic text will be the New York Times), public speeches and political essays, the lyrics of popular music, and more conventional specimens of contemporary literature. Supplementary readings include the racial, sexual, social, and political assumptions of standard English. Written work—first frequent short papers and then longer essays—includes imitations and critical analyses of the texts and self-critical accounts of earlier writing assignments.

109 Literature and Other Disciplines Fall. 3 credits.
W. Kennedy.
Different disciplines require different types of reading skills and writing techniques. The aim of this seminar is to isolate a set of problems from three literary texts and to compare the solutions in the fields of history, psychology, and sociology. The texts are Shakespeare’s Antony and Cleopatra, Dostoevsky’s Notes from the Underground, and Proust’s Swann’s Way. For papers, writers will address issues of how various disciplines assess primary data and how to evaluate the achievements in each discipline.

112 Obsession and Madness Fall or spring. 3 credits.
K. Shea.
Through a selection of texts, ranging from Goethe’s The Sorrows of Young Werther to Nabokov’s Lolita, we will attempt to explore the complexities of the phenomenon of obsession in modern literature. The demands of the genre (mostly prose) as well as the topic itself will lead us into discussion of the uses and limitations of first-person narrative voice. Toward the end of the semester, there will be a slight emphasis on the more specific topic “Women and Madness.”

114 Multiple Voices: Self-Discovery through Literature Fall. 3 credits.
J. Monroe.
This course will focus on various relations between writers and readers, problems of interpretation and meaning, and the contributions fictional narrative can make to our continual process of self-discovery. We will be examining especially the extent to which varying uses of language shape our ways of seeing ourselves and the world around us. Readings will include works by Poe, Melville, Flaubert, Chopin, and Kafka.

117 Morality and Literature Fall or spring. 3 credits.
S. Reimer.
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 preachers and politicians enlighten us, or do they distort our notions of right and wrong? Do doctors 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 inducement to moral seriousness. Works by Plato, Euripides, Boccaccio, Shakespeare, Molière, Sade, Shelley, Flaubert, Tolstoy, and Brecht and from popular culture and the mass media.

118 The Styling of Thought Fall or spring. 3 credits.
D. Polikoff.

English

105 Women and Writing (also Women’s Studies 108) Fall or spring. 3 credits each term.
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 literarur? This course will explore the relationship 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 relations between women and writing. Which section to choose should depend on the reader’s interest in exploring how women appear in private or autobiographical writings, historical contexts, and/or literary works.

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.

105.1 Women’s Stories: Strategies of Narrative and Representation (also Women’s Studies 106.1) Fall. 3 credits.
L. Langbauer.
We will begin with some critical essays about how difficult—or not impossible—it is for women to tell their own stories, and spend the rest of the semester examining the reasons why, especially looking at what
women authors themselves tell us within their writing. We will be concerned with how they have to say (are there plots that have no room for women's experience? are there any that are free of male definition?); how they say it (what is the relation between form and content? form and subject? form and genre? form and politics? form and politics lead to anything new?); and what they can't say (what do the gaps and contradictions within texts tell us?). We will read (mostly) twentieth-century authors in a variety of forms: stories, novels, memoirs, poems, and drama. Some of the authors we may consider: Charlotte Perkins Gilman, Susan Keating Glaspell, Isak Dinesen, H. D., Gertrude Stein, Virginia Woolf, Djuna Barnes, Dorothy Richardson, Sylvia Plath, Gloria Steinem, Nora Ephron. What do we discover about the readings we will apply to the course writing. Class members will not only experiment with different forms themselves, but will approach their own and each others' writing with the same questions we ask about the texts.

105.2 Writing as Women (also Women's Studies 106.2) Fall. 3 credits. J. Frank.

We will focus on the autobiographical essays of students in the class, in which they explore various aspects of gender. We will see how autobiographies will inevitably shape our discussions. First, we will examine the modes of thought of people in general and women in particular that form our sense of how a self (a female self) is constituted. Second, we will discuss the essay form and the presuppositions that lie behind such formal requirements as introduction, body, and conclusion; students will be encouraged to challenge and play with these conclusions in the more loosely defined mode of writing in which they will be engaging. Readings from Simone de Beauvoir, Adrienne Rich, and Toni Morrison, as well as a formula romance and Hitchcock's Vertigo.

105.3 Digressions of Desire (also English 106.3, Women's Studies 106.3, and Women's Studies 107.3) Fall or spring. 3 credits. P. Gill.

Alice Walker's The Color Purple, Lorrie Moore's Self Help, Toni Morrison's The Bluest Eye, and Marabel Morgan's The Total Woman describe ways in which women perceive of and act on their own needs and wants while positioning themselves in terms of masculine desire. Based on close readings of these books, the class will discuss and write about how various methods female characters/women adopt to decide on and achieve (if not fail to achieve) their goals. We will also investigate how these goals are formed, why the change of this change is a reflection of, or reaction to, perceptions of masculine desire. Discussion of these latter issues will be supplemented by readings of excerpts from various critical writings of feminists and, possibly, a Harlequin or other popular romance.

105.4 Closed Doors, Open Windows: Attitudes toward Enclosure (also Women's Studies 106.4) Fall. 3 credits. J. Fisher.

This course will be loosely organized around a common theme in women's literature: physical or intellectual confinement. We will discuss ways in which confinement can be destructive or repressive and where liberation is sought as a relief. Yet enclosure can also be advantageous: Woolf, for example, for the woman writer. When does confinement produce or enrich, necessary discipline or structure? What are some ways women writers have learned to work within societal and literary constraints? Do the women writers reject traditional constraints or try to combine constraints of their own? Readings will include Jane Eyre, by Charlotte Bronte; A Doll's House, by Henrik Ibsen; A Room of One's Own by Virginia Woolf; Charlotte Perkins Gilman, Grace Paley, Flannery O'Connor, and others; and selected poetry by Emily Dickinson, Elizabeth Bishop, Sylvia Plath, Adrienne Rich, Margaret Atwood, and other writers expected to help organize class discussions and to write a series of short analytic essays on the readings.

106.1 Public Lives, Private Writing: Writing as Women (also Women's Studies 107.1) Spring. 3 credits. J. Fisher.

This course will focus on the private experiences of women's lives and the many ways autobiography, topics discussed will include women's attitudes towards their bodies; their relationships with their mothers, fathers, husbands, and lovers; their political awakenings; and the continuing question of vocation. Readings will include The Bell Jar, by Sylvia Plath; letters and diaries by Dickinson, Barrett Browning, E. C. Stanton, S. B. Anthony, Woolf, Plath, and others, and essays by Simone de Beauvoir, Adrienne Rich, Tille Olsen, and Alice Walker. Students will be expected to keep journals that they will share with the class, to participate extensively in class discussion, and to write a series of very short, analytic essays on the readings.

106.2 The Politics of Sexuality (also Women's Studies 107.2) Spring. A. Cvetkovich.

We will examine how sexuality functions as a locus for political debate by exploring the way literature, film, and other texts shape our views about sexual norms and behaviors. Does our fascination with sexuality in social arrangements such as marriage and the family, sexuality as a basis for defining gender, sexuality as a means of both political resistance and political conformity, sexunya, and sexual politics lead to anything new?); and what they say it (what is the relation between form and content? literary constraints? Do some women writers reject the shape of stories persuade us to understand our lives as the films?); and what do the shape of a life provide us with the model for stories? Students will write expository and analytical essays, several short stories, and a series of finished essays; and one longer narrative. Texts will include fiction by Henry James, Virginia Woolf, and Eudora Welty, case histories by Sigmund Freud; The Autobiography of Alice B. Toklas; and the films Citizen Kane and It's a Wonderful Life.

127 Shakespeare and Politics Fall. 3 credits. J. Fisher.

Shakespeare's plays will be discussed from among Richard II, Henry IV, Henry V, As You Like It, Measure for Measure, Troilus and Cressida, King Lear, Julius Caesar, 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 issues of order and rebellion. Students will write seven or eight expository essays, three short stories, and one longer narrative. In the shape of stories persuade us to understand our lives as the films?); and what do the shape of a life provide us with the model for stories? Students will write expository and analytical essays, several short stories, and a series of finished essays; and one longer narrative. Texts will include fiction by Henry James, Virginia Woolf, and Eudora Welty, case histories by Sigmund Freud; The Autobiography of Alice B. Toklas; and the films Citizen Kane and It's a Wonderful Life.

133 Forms of the Essay Fall or spring. 3 credits. S. Davis and staff.

An introduction to the writing of essays. How do writers turn their topics into the several kinds of finished essays normally required for college courses? (How do they develop good topics in the first place? How do they reach those audiences? What decisions do they make about style, structure, and the means of persuasion? We will try to answer these questions by examining published and student work in a variety of fields and by executing weekly assignments of three to four pages, as well as two short research papers.

135 Writing from Experience Fall or spring. 3 credits. J. Bishop and staff; spring: A. Boehm and staff. Designed to give each student an opportunity to write about his or her own experience in an interesting way.

During 1985—86 a limited number of students will have the opportunity of fulfilling their Freshman Seminar requirement by enrolling in a year-long sequence of English 135 and English 136 that will emphasize continuity between the two courses. (The two classes will be held each semester on Tuesdays and Thursdays at 8:40 a.m.) Students may take the sequence in either order: English 135 followed by English 136 or English 136 followed by English 135. By permission of the instructors, A. Boehm and L. Fakundiny.
Most of the class time and conferences are devoted to reading, discussion, and evaluation of the students’ own work.

136 Practical Prose Fall or spring. 3 credits. Fall: G. Teskey and staff; spring: K. Gottschalk and staff.
A course in the elements of style in expository writing, for people preparing for courses and careers where success depends on being able to answer questions with clarity and grace. Frequent short papers (about fourteen) analyzing essays by such writers as E. B. White, F. Galasso, Thomas S. Kuhn, George Orwell, Doris Lessing, Carl Sagan, and Henry David Thoreau. Readings for different sections may vary.

141 The Bible and Ancient Authors Fall or spring. 3 credits. C. Kaske and 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.

150 The Modern Imagination Fall or spring. 3 credits. Fall: S. Siegel and staff; spring: L. Green and staff.
Readings in twenty-century authors who willfully attempt to create something new and original. Whether they succeed will be one of the questions the seminar considers. Selected essays, poems, plays, and fiction by Beckett, Borges, Barthès, Conrad, Lewis, Nietzsche, Pound, Stevens, Wilde, Yeats, and others. Frequent short papers; conferences.

158 American Literature and Culture Spring. 3 credits. Fall: D. McCull and staff; spring: J. Bishop and 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 or spring. 3 credits. Fall: M. Hite and staff; spring: L. Fakundiny and 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.

270 The Reading of Fiction Fall or spring. 3 credits. Students should register with the Department of English, not the Freshman Seminar Program.
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—Belloc, 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 requirement or the Freshman Seminar requirement, but not both. Recommended for English majors.

271 The Reading of Poetry Fall or spring. 3 credits. Students should register with the Department of English, not the Freshman Seminar Program.
Staff.
Designed to sharpen the student’s powers to understand and respond to poetry. Readings in the major poetic 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.

215 English for Later Bilinguals (also Modern Languages and Linguistics 215) Fall. (Note: This course is designed to familiarize students with literary forms and 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.

121 Intensive Workshop in Germanic Studies for Freshmen Fall or spring. 4 credits. Taught 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. T. R. 2:30–4:30. H. Deinert.

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.

216 English for Later Bilinguals (also Modern Languages and Linguistics 216) Spring. (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 Wednesday, August 28, from 10–noon or 2–4 p.m. (sign up for individual appointments at Freshman Seminar exchange). 3 credits.
M. Martin.
A course 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. The course will consist of four main components: a basic expository piece, and paragraph structure and organization of compositions. The major component of the course is the production of a research paper—a project that helps develop skills in literary resource use, note taking, paraphrasing, summarizing, and following the conventions of formal paper writing.

105 French Novel (also Romance Studies 105) Fall. 3 credits.
A. Colly-Ball.
Evolution of the French novel from the seventeenth century to the present. Discussion of novels by such writers as Madame de Lafayette, Laclos, Stendhal, Flaubert, Maupassant, Sartre, and Robbe-Grillet (readings in English translation).

103 Techniques of Interpretation: An Introduction to Semiotics (also Romance Studies 103) Fall or spring. 3 credits.
Staff.
In its broadest meaning, semiotics is the study of signs that carry information: roadside signs, fashions, advertisements, publically posters, and literary modes. Whether success depends on being able to answer questions with clarity and grace. Frequent short papers (about fourteen) analyzing essays by such writers as E. B. White, F. Galasso, Thomas S. Kuhn, George Orwell, Doris Lessing, Carl Sagan, and Henry David Thoreau. Readings for different sections may vary.
students may judge for themselves the ways writing can be used and is used to argue positions. A concurrent task will be students’ examination of the differences between the images presented in participants’ accounts (e.g., Blooms) or novels (e.g., 8th Valley) and those of other decision makers’ writings, to discover why and how omission and distortion occur and affect policy-making.

100.2 The United States in Central America: The Empire Strikes Again Fall or spring. 3 credits.
D. Hathaway.
George Orwell claimed that one of the more peculiar aspects of British politics in the early twentieth century was that few British people saw themselves as part of an international empire. The same can be said about the U.S. today. Our effort to understand the U.S. role in Central America will be fourfold: (1) building on the work of historian William Appleman William, we will try to understand the concept of U.S. empire as a central force shaping U.S. policy; (2) through novels by Central American authors, we will explore personal aspects of life in Central America; (3) through writings of historians, journalists, political scientists, and the U.S. government, we will cultivate our awareness of the facts of the Central American experience and gain insight into the motivations of various parties involved in the current conflicts; (4) the course will conclude with a consideration of various proposals to obtain “peace” in the region.

100.3 The Pornographic Mind—Readings in Feminist Theory Fall or spring. 3 credits.
M. Caputo.
What is the “pornographic mind”? Is it particular to Western culture and society? This course will seek to answer these and other questions currently discussed in feminist theory. Beginning with an analysis of the liberal feminist position, we will then be given to alternative perspectives such as the Marxist and psychoanalytic schools, the biological question, and separatist politics. Discussions will focus on evaluating and contesting these feminist theories. Readings will include works by Shulamith Firestone, Simone de Beauvoir, Helene Cixous, and Gloria Steinem, with special attention given to Susan Griffin’s “Pornography and Silence.”

100.4 The Catholic Church in American Politics Fall or spring. 3 credits.
T. Bynum.
In recent years the leaders of the American Catholic church have become increasingly involved in particular issues of American politics. The bishops have issued pastoral letters on nuclear weapons and the U.S. economy, read the opposition to abortion well known, and been involved in the sanctuary movement for Central American refugees. This course will examine possible causes of this activism, focusing on developments within the church itself and in the wider political arena. It will also examine the effects of these developments on politics and what these might mean for the future role of the Catholic church in American politics.

100.5 Nonviolence—Theory and Practice Fall or spring. 3 credits.
F. Brooks.
We will critically examine the use of nonviolent resistance and civil disobedience as means for both (sociopolitical) reform and revolution. In the first part of the course, we will survey some of the theoretical underpinnings of, and justifications for, nonviolence in action, including the Indian independence movement and the U.S. civil rights movement. In the second part of the course, we will look at nonviolence in action, including the Indian independence movement and the U.S. civil rights movement.

100.6 On the Road Again: Freedom as Motion Spring. 3 credits.
E. Kenworthy.
Not only are U.S. citizens geographically mobile, they often link mobility to their sense of freedom and fulfillment. From the westward migration of past centuries to the global expansion and moon landings of recent decades, the link to the latest Bruce Springsteen lyrics, “moving on” has been integral to the American dream. We will examine the implications of this “flight forward,” paying particular attention to political thought and practice.

100.7 Science and Politics Fall or spring. 3 credits.
S. Van Hols.
This course will examine the ongoing relationship between science and politics and delineate how this relationship has changed the character of both fields. Specific topics will include the development of instrument rationality (Webber), the notions of politics based on nature and motion (Aristotle and Hobbes), man as creator (Marx and Nietzsche), and the notion of a science of politics (positivists).

100.8 Law, Order, and Government—Are Liberalism and Democracy Compatible? Fall or spring. 3 credits.
S. Reich.
What is the relationship between the individual and the state? Does it vary among advanced industrial societies? What should the nature of that relationship be? We shall examine various notions of the role of government and how it affects our lives.

100.9 International Energy Problems and Interdependence Fall. 3 credits.
L. Scheinman.
This seminar will examine international energy problems in the context of the concept of interdependence. Attention will be given to the sources of the energy problem, its evolution from abundance to scarcity to apparent renewed abundance (especially oil), the political dynamics of energy supply and demand, and the development of energy security policies among the advanced industrial states.

100.10 Mao Zedong Fall. 3 credits.
M. Bernai.
The seminar will be concerned with the thoughts and actions of Mao Zedong. The approach will be biographical, dealing with his background, childhood, education, and revolutionary experience, but emphasis will be placed on his political role after 1949.

History

108 Civil Liberties in the United States Spring. 3 credits. Prerequisite: permission of instructor. R. Polenberg.
Freedom of speech and dissent from Jefferson’s time to the present, with emphasis on the twentieth century. Topics include Jefferson and Burr, Lincoln and martial law, war and the Supreme Court; the American Civil Liberties Union and the New Deal; the relocation of Japanese Americans; the cold war and McCarthyism; religious cults and “brainwashing”; John Milton, Stuart Mill, and the critique of libertarianism.

158 Education in the Renaissance and Reformation Fall. 3 credits.
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 the late Renaissance ideals of education and their effect on the course of the Reformation. Throughout the term we will ask questions about reading, writing, and teaching that are of interest to students and teachers of today as well as during the Renaissance. Discussions will attempt to stimulate students to consider their own goals for the educational process as they respond to the readings. Weekly writing assignments will give them opportunities to express these concerns and reflect on their own activities as writers.

175 Law, Liberty, and Crime in England, 1700–1850 Spring. 3 credits.
C. Reynolds.
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 Beggars 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.

188 The Viet Nam War Fall or spring. 3 credits. J. Coyer.
Students 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.

219 History of North American Indians Spring. 3 credits. Prerequisite: permission of instructor. D. 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.

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 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.
Not open to students who have taken History of Art 103.
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

[113 Hispanic Bilingualism Fall. 3 credits. Not offered 1985–86. (See also Sociology 100.6.)
I. Almirall-Padamsee.
An introductory sociolinguistics course that focuses on concepts central to the study of language in a particular sociocultural setting, as well as those critical to a study of languages in contact. These two prime components of the course are studied in the specific context of the Spanish-English bilingual Hispanic in the United States. Topics include code switching, interference, Spanglish, and Ebonics, among others. Writing assignments, varying in length, are designed to respond to the students’ needs and interests.]

Special Programs and Interdisciplinary Studies
114 Hispanic Bilingualism  Spring. 3 credits. This course is a continuation of Linguistics 113, but 113 is not a prerequisite.
I. Almiral-Padasmee.
After an initial review of the notion of bilingualism, the course emphasizes specific aspects of Hispanic bilingualism in the United States—its sources, nature, and implications. Code switching versus Spanglish and interference with respect to the Mexican-American, New York—Puerto Rican Spanish and English, and language dominance are among the topics discussed. Reading assignments are drawn from the fields of sociolinguistics and bicultural education; writing assignments, varying in length, respond to student needs and interests.

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 centuries. Readings in English translation will explore 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 or spring. 3 credits.
Staff.
King Arthur and the knights of the round table inspired the best-selling literature of medieval Europe as well as 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 issues 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 Medieval Fantasy and Science Fiction  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, Bernold Silvestri'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 Centuride for Leibowitz, or works by Ursula Le Guin and Poul Anderson.

Modern Languages and Linguistics

See "English for Later Bilinguals" and "Linguistics."

Music
For full descriptions of the following courses, see listings for the Department of Music.

111 Sound, Sense, and Ideas  Fall or spring. 3 credits.
M W F Staff.

[113 Opera  Spring. 3 credits. Not offered 1985–86.  N. Zaslaw]
theories will be applied to organizations ranging from universities, citizen protest groups, and skid row rescue missions to police agencies, major corporations, and the funeral home industry. The writings of such theorists as Marx, Weber, Michaelis, Gouldner, and Aldrich will frame our inquiry into the expanding role of organizations in modern society.

100.5 Work and Change in America  Fall. 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. (See also Linguistics 113–114.) E. Acevedo
Emphasis on training students in the proper writing skills for accurate and effective usage in the social sciences. Sociological material will include culture, social change, intergroup relations, the urban experience, language, and bilingualism. Readings include second-language interference, dialects, and "the language of the marketplace"; the media and pop English; and ethnic perception of English. Biweekly assignments will be based on these topics. Excessive use of group discussions, guest speakers, voluntary oral presentations, and research techniques for written assignments.

100.7 Hard Choices (also Biology and Society 102)  Spring. 3 credits. S. Siskin

100.8 Rural Life as Metaphor (also Biology and Society 101)  Fall. 3 credits. S. Siskin
There is a long and influential literary tradition of using images of rural life to express attitudes, beliefs, and even ideologies about the social order, culture, economics, politics, aesthetics, and morality. We will survey that tradition in English verse and look at its influence on painting, essays on politics and culture, and advertising in England and America. Our thematic focus will be on images of rural life in relation to rural poverty (especially in eighteenth- and nineteenth-century England) and to technology (especially eighteenth- to twentieth-century America).

100.10 Sociology of Latin America  Fall. 3 credits. E. Polakoff, E. Acevedo
This is an interdisciplinary course that integrates historical, anthropological, economic, sociological, and literary works 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 with a good measure of clarity, and the contribution 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 enters the problems selected for investigation and analysis and changes in the way we think about social problems.

Spanish Literature

109 Revolution and Literature in Latin America  Fall or spring. 3 credits. C. Menchaca
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 García Márquez, poetry by Pablo Neruda, essays by Octavio Paz and Ernesto ("Che") Guevara, and a speech by Fidel Castro. Some work by well-known authors, such as Mariano Azuela and Manlio Argueta, will also be treated. The class will normally meet twice weekly for analysis and discussion of texts and student writing, although individual conferences will replace a common session several times during the semester.

Theatre Arts

130 American Myth in Drafo  Fall or spring. 3 credits.

Staff
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.

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 theatrical strategies of theatre to their own essay writing. Texts will include Theatre Master 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.

Writing

137–138 Workshops in English Composition 137: fall; 138: spring. 3 credits each term. S-U grades only. Hours to be arranged. N. Kaplan, M. Gilliland, R. K. Hoptikho, J. Martin.

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 workshops for the workshop and biweekly 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 256-6349 to make an appointment with a member of the Writing Workshop staff.

Faculty Roster

Abrams, Meyer H., Ph.D., Harvard U. Class of 1916 Professor of English Emeritus, English
Abreu, 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
Ah, Fredrick M., Ph.D., U. of Texas at Austin. Prof., Classics
Ahlbrecht, Andreas C., Ph.D., U. of Washington. Prof., Chemistry
Ambegaokar, Vinay, Ph.D., Carnegie Inst. of Technology Prof., Physics/LASSP*
Ammons, Archie R., B.S., Wake Forest Coll. Goldwin Smith Professor of Poetry. English

Anderson, Benedict R., Ph.D., Cornell U. Prof., Government
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 Hinchliff Professor of Spanish Literature, Romance Studies/Comparative Literature
Ashcraft, Robert D., Ph.D., U. of California at Los Angeles. Prof., Anthropology
Ashford, C., Ph.D., Cambridge U. (England). Prof., Physics/LASSP*
Austin, William W., Ph.D., Harvard U. Given Foundation Professor of Musicology, Music
Babbie, Leonard H., Ph.D., UCLA. Prof., Modern Languages and Literatures/Near Eastern Studies
Bacharach, Samuel B., Ph.D., U. of Wisconsin. Assoc. Prof., Industrial and Labor Relations/Sociology
Baeder, Barbara, Ph.D., Cornell U. Asst. Prof., Chemistry
Baugh, Daniel A., Ph.D., Cambridge U. (England). Prof., History
Beckwith, Steven V. W., Ph.D., California Inst. of Technology Assoc. Prof., Astronomy/CRSR*
Bem, Daryl J., Ph.D., U. of Michigan. Prof., Psychology
Bem, Sandra L., Ph.D., U. of Michigan. Prof., Psychology/Women's Studies
Belarde, Jacques, Doctorat d'Univ., U. of Lille (France). Prof., Romance Studies
Berkeland, Karl, Ph.D., Cornell U. Prof., Physics/LALS
Bennet, Judith, Ph.D., Columbia U. Asst. Prof., History of Art
Berstein, Israel, Candidate in Physico-Mathematical Sciences, Roumanian Academy. Prof., Mathematics
Bethe, Hans A., Ph.D., U. of Munich (Germany). John Wendell Anderson Prof. of Physics Emeritus, Physics
Bishop, Jonathan P., Ph.D., Harvard U. Prof., English
Blackall, Eric A., LITT., Cambridge U. (England). Jacob Gould Schurman Professor of German Literature Emeritus, German Literature
Blumkin, Jean P., Ph.D., Harvard U. Prof., English
Blumkin, Stuart M., Ph.D., U. of Pennsylvania. Assoc. 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 Literatures
Boyd, Richard N., Ph.D., Massachusetts Inst. of Technology Prof., Philosophy
Breiger, Ronald L., Ph.D., Harvard U. Prof., Sociology
Briggs, Herbert W., Ph.D., Johns Hopkins U. Goldman Smith Professor of International Law Emeritus, Government
Bronfenbrenner, Ulric, Ph.D., U. of Michigan. Jacob Gould Schurman Professor, Human Ecology/Psychology
Brown, Kenneth S., Ph.D., Massachusetts Inst. of Technology Prof., Mathematics
Brown, Laura D., Ph.D., U. of California at Berkeley Assoc. Prof., English
Baugh, Lawrence D., Ph.D., Cornell U. Prof., Mathematics
Brown, Stuart M., J.r., Ph.D., Cornell U. Prof. Emeritus, Philosophy/Science, Technology, and Society
Brown, Theodore M., Ph.D., U. of Utrecht (Netherlands). Emeritus Professor of History of Art
Browne, E. Wayles III, Ph.D., U. of Zagreb (Yugoslavia). Prof., History
Brumberg, Joan Jacobs, Ph.D., U. of Virginia. Asst. Prof., Modern Languages and Literatures
Buchanan, John S., Ph.D., U. of Zagreb (Yugoslavia). Prof., History
Buck-Morss, Susan F., Ph.D., Georgetown U. Assoc. Prof., Government
Burkett, Kenneth M., Ph.D., Northwestern U. Assoc. Prof., Economics
Buritch, James M., Ph.D., Massachusetts Inst. of Technology Assoc. Prof., Chemistry
Caldwell, Steven B., Ph.D., Cornell U. Assoc. Prof., Sociology

* denotes members of the Faculty of Arts and Sciences who are primarily active in the School of International and Public Affairs.
Vanek, Jaroslav, Ph.D., Massachusetts Inst. of Technology. Carl Marks Professor of International Studies, Economics

Vaught, Stephanie, M.F.A., U. of Iowa. Asst. Prof., English

Vernon, Kathleen M., Ph.D., U. of Chicago. Asst. Prof., Romance Studies

Veverka, Joseph F., Ph.D., Harvard U. Prof., Astronomy/CRSR

Vogtmann, Karen L., Ph.D., University of California at Berkeley. Asst. Prof., Mathematics

Voiten, Thomas P., Ph.D., U. of Chicago. Asst. Prof., Archaeology

Wachberg, Milton W., Ph.D., Princeton U. Asst. Prof., Philosophy

Wahlin, Lars B., Ph.D., U. of Göteborg (Sweden). Prof., Mathematics

Wan, Henry Y., Jr., Ph.D., Massachusetts Inst. of Technology Prof., Economics

Wasserman, Ira M., Ph.D., Harvard U. Asst. Prof., Astronomy/CRSR

Waugh, Linda R., Ph.D., Indiana U. Prof., Modern Languages and Linguistics/Comparative Literature

Webster, James, Ph.D., Princeton U. Prof., Music

Weiss, John H., Ph.D., Harvard U. Assoc. Prof., History

West, James E., Ph.D., Louisiana State U. Prof., Mathematics

Wetherbee, Winthrop, Ph.D., U. of California at Berkeley. Prof., English/Medieval Studies/Classics

Widom, Benjamin, Ph.D., Cornell U. Goldwin Smith Professor of Chemistry, Chemistry

Wiesentfeld, John R., Ph.D., Case Inst. of Technology Prof., Chemistry

Wilcox, Charles F., Jr., Ph.D., U. of California at Los Angeles. Prof., Chemistry

Wilkins, John W., Ph.D., U. of Illinois. Prof., Physics/LASSP

Williams, L. Pearce, Ph.D., Cornell U. John Stambaugh Professor of History, History

Williams, Robin M., Jr., Ph.D., Harvard U. Henry Scarborough Professor of Social Sciences, Sociology

Wilson, Kenneth G., Ph.D., California Inst. of Technology. James A. Weeks Professor in Physical Sciences, Physics/LNS

Wisnisk, Jennifer, Ph.D., U. of Pennsylvania. Asst. Prof., Economics

Wolczanski, Peter T., Ph.D., California Inst. of Technology. Asst. Prof., Chemistry

Wolff, John U., Ph.D., Yale U. Prof., Modern Languages and Linguistics

Wolters, Oliver W., Ph.D., U. of London (England). Goldwin Smith Professor of Southeast Asian History, History

Wood, Allen W., Ph.D., Yale U. Prof., Philosophy

Wright, Randall D., Ph.D., U. of Minnesota. Asst. Prof., Economics

Wyatt, David K., Ph.D., Cornell U. Prof., History

Yen, Tung-mow, Ph.D., Harvard U. Prof., Physics/LNS

Yano, Makoto, Ph.D., U. of Rochester. Asst. Prof., Economics

Young, Donald R., Ph.D., Columbia U. Prof., Physics/LNS

Zaslaw, Neal A., Ph.D., Columbia U. Prof., Music

*Laboratory of Atomic and Solid State Physics.
†Center for Radiophysics and Space Research.
‡National Astronomy and Ionosphere Center.
§Laboratory of Nuclear Studies.
Division of Biological Sciences

The Division of Biological Sciences provides a unified curriculum for undergraduate majors described 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; Genetics and Development; Ecology and Systematics; Complementary Biology and Behavior; Physiology; Plant Biology; and, in addition, the L. H. Bailey Hortorium and the Shoals Marine Laboratory.

The offices, research laboratories, and classrooms of biology faculty members are located in many different buildings on the campus, primarily in the Colleges of Agriculture and Life Sciences, Arts and Sciences, and Veterinary Medicine.

Student services are provided by the division's Office for Academic Affairs and the Behrman Biology Center, both located in Stimson Hall, where academic advice, information on biological sciences course offerings, other important information, and counseling are available for undergraduates. The Office for Academic Affairs also follows the progress of biology majors and works closely with faculty advisers. Additional services and resources of the Biology Center include academic program planning, tutoring, lecture tapes, examination files, and information on undergraduate research opportunities.

The center has comfortable areas for studying and relaxing.

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 campus counseling for those interested in the marine sciences and administers the SEA Semester program for Cornell students pursuing studies at Woods Hole or abroad the schooner Westward.

Faculty


Other Teaching Personnel


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), 107, 109-110, 105-106, or 101-103. Advanced placement in biology with a score of 4 or 5 (6 or 8 credits, respectively) also satisfies the requirement for introductory biology. Students registering in Physics 208 are advised to complete Physics 214 as well.

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. Advanced placement in biology with a score of 4 or 5 (6 or 8 credits, respectively) also satisfies the distribution requirement in the biological sciences.

In the College of Human Ecology, the natural sciences distribution requirement includes at least 6 credits selected from Biological Sciences 109-110, 101-103 plus 102-104, or 105-106 or from specified courses in chemistry or physics. Advanced placement in biology with a score of 4 or 5 (6 or 8 credits, respectively) satisfies the distribution requirement in the natural sciences.

Biological Sciences 101-102-103 should be taken as a unit by students of any college.

Note: Biological Sciences 100, offered during the six-week Cornell Summer Session for 7 credits, also satisfies the distribution requirement.

Switching from one introductory biology sequence to another at midyear may not be possible because of variation in presentation of topics. Students must receive permission of the instructor to switch sequences. Taking sequences in reverse or in consecutive order is strongly discouraged.

The Major

The Division of Biological Sciences offers a major in biological sciences to students enrolled in either the College of Agriculture and Life Sciences or the College of Arts and Sciences. The undergraduate program is coordinated for students in both colleges.

During the second semester of the sophomore year, students who intend to major in biological sciences must apply for acceptance into the major with the associate director for academic affairs, in 118 Stimson Hall. Students in the College of Agriculture and Life Sciences who were admitted directly to the major must complete the application process to declare a concentration area and to assure satisfactory progress towards completion of the major. Acceptance into the major requires completion of the course sequences in introductory biology, chemistry, and mathematics (see requirements 1-3 below), plus one semester of organic chemistry lectures. In addition, a 2.75 Cornell cumulative grade-point average is required for final acceptance into the major except for those students admitted directly to the major as freshmen (College of Agriculture and Life Sciences students only) or as transfers. Students in the process of completing these prerequisites for admission to the major may be accepted on a provisional basis. Final acceptance into the major is required for graduation with a biological sciences major. It is the student's responsibility to assure that final acceptance has been granted.

Whenever possible, students should include the introductory biology, chemistry, and mathematics sequences in their freshman schedule and complete the organic chemistry lecture course in their sophomore year. Students are not encouraged to continue with the major in biological sciences unless performance in these four subjects gives evidence of capacity to perform satisfactorily at a more advanced level.

The requirements for the biological sciences major are listed below. These courses should be taken for a letter grade, unless the course is offered for S-U grades only.

1) Introductory biology for majors (one year):
   Biological Sciences 101-103 plus 102-104, or 105-106. Biological Sciences 100, offered during the six-week Cornell Summer Session for 7 credits, also satisfies the introductory biology requirement for majors. Students may choose to accept advanced placement if they have received a score of 5 on the Advanced Placement Examination of the College Entrance Examination Board (CEEB). Students with a score of 4 must fulfill the introductory biology requirement by taking Biological Sciences 101-103 or 102-104. Students should consult information available in the course office (130 Academic II) and in the Biology Center (G20 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 (one year):
   Chemistry 207-208, 253 and 251, or 215-216, or 103-104.

3) College mathematics (one year, including at least one semester of calculus):
   Mathematics 111-112, 105-110, or 111-115. 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, 112-213,* or 101-102. Students registering in Physics 208 are strongly encouraged to opt for the optics branch. Those who take Physics 112-213 are advised to complete Physics 214 as well.

6) Genetics:
   Biological Sciences 281.

7) Biochemistry:
   Biological Sciences 330 or 331.

8) A concentration area selected from the outline below.

*
9) **Breadth in biology**, as described below:

10) **Foreign language**: students registered in the College of Agriculture and Life Sciences must satisfy the foreign language requirement of the Division of Biological Sciences by (a) presenting evidence of successful completion of three or more years of study of a foreign language in high school or (b) attaining a score of 550 or more on the reading portion of the College Entrance Examination Board achievement test or
(c) achieving "qualification" status in a language as defined by the College of Arts and Sciences or (d) successfully completing at least 6 college credits in a foreign language.

Students registered in the College of Arts and Sciences must satisfy the language requirement as stated by that college.

Although not required for the biological sciences major, a course in statistics is recommended for students planning graduate study or a research career. Students should consult their faculty advisers when choosing appropriate courses in statistics.

Since modern biology has an important physical and career. Students should consult their faculty advisers although not required for the biological sciences major, a course in statistics is recommended for students interested in biochemistry, cellular biology, ecology, vertebrate or invertebrate biology, biophysics, microbiology, or neurobiology (as approved by the adviser). Courses used to fulfill the concentration requirements may not be counted toward fulfillment of the breadth requirement.

Note: The above requirements are for those who declare the concentration in neurobiology and behavior in September 1983. Students who declared the concentration in neurobiology and behavior prior to September 1983 should complete the concentration requirements as stated in the 1982-83 edition of Courses of Study.

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 with their advisers to determine the Section of Neurobiology and Behavior (W119 Seeley G. Mudd Hall) to make up the deficiency.

B) **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 seven existing 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, 118 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 would 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 credit 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 Section of approved breadth courses.

1) **Animal Physiology and Anatomy**: Biological Sciences 237, 241, 242, 311, 313, 315, Nutritional Sciences 331.

2) **Botany**: Biological Sciences 241, 242 and 244, 341 and 349, 343, 345, 441, 448, Plant Pathology 369.

3) **Cellular Biology**: Biological Sciences 305 and 307, 316, 347, 432, Microbiology 290.

4) **Developmental Biology**: Biological Sciences 385, 389, 483, Animal Science 220.

5) **Ecology, Systematics, and Evolution**: Biological Sciences 261 (360), 282 (280), 378 (477).

6) **Neurobiology and Behavior**: Biological Sciences 221, 222.
Note: Students concentrating in animal physiology and anatomy may not use Biological Sciences 316, 347, 385, 389, or 432 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.

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. The specific requirements for the program are:

1) Ecology (Bio S 261 [360] or 262 [260]).
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 274, The Vertebrates; Bio S 343, Taxonomy; Bio S 348, General Microbiology; Entom 212, Insect Biology; Micro 290 and 291, General Microbiology.
5) At least one course concentrating on plants. This may be satisfied by a course that also fulfills requirement 3 or 4.
6) At least one course 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 281, Genetics; 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 in General Biology. These projects must fulfill all other requirements for the biological sciences major. The specific requirements for the program are:

1) Ecology (Bio S 261 [360] or 262 [260]).
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 274, The Vertebrates; Bio S 343, Taxonomy; Bio S 348, General Microbiology; Entom 212, Insect Biology; Micro 290 and 291, General Microbiology.
5) At least one course concentrating on plants. This may be satisfied by a course that also fulfills requirement 3 or 4.
6) At least one course 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 281, Genetics; Bio S 311, Introductory Animal Physiology, Lectures; Bio S 315, Ecological Animal Physiology, Lectures; Bio S 330 or 331, Principles of Biochemistry.

Research credits may not be used in completion of the following concentration areas: animal physiology and anatomy; biochemistry; botany, cell biology, and ecology; 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 an original research project under the direct guidance of a faculty member. Applications for the honors program are available in the Office for Academic Affairs, 118 Stimson Hall. Students must submit 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 in the Division of Biological Sciences to supervise their research. An honors candidate usually enrolls for credit in Biological Sciences 499 (Undergraduate Research in Biology) under the direction of a faculty member and as honors supervisor. 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 Behrman 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 Behrman 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.
103-104 Biological Sciences, Laboratory 103, fall; 104, spring. 2 credits each term. Prerequisite: concurrent enrollment in Biological Sciences 101 (fall) or 102 (spring). Passing grade (D or better) in 101 or 102 (required) unless written permission is obtained from instructor. S-U grades optional, with permission of instructor. No admittance after second week of classes. Lab, M T W Th F 7:30-10:30 p.m., or T R or S 8-11. One 3-hour lab each week and a weekly lec for discs, special lecs, etc. J. C. Glase, P. R. Ecklund, and staff.

A laboratory course emphasizing the methods used by scientists to discover new biological knowledge. Students design and perform investigations in all of the major areas of biology. In preparation for this, 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 investigative 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 first 200 students passing unit I within prescribed time. 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 or 104. No admittance after first week of classes. Fee, $5. Lec, T 9:05; additional study and lab hours arranged at student's convenience. First lec on Thursday, August 29. J. Gibson, 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. The fall semester covers biochemistry and physiology. The spring semester covers genetics, development, ecology, evolution, behavior, and the diversity of organisms. The course uses an autotutorial format and covers material from readings, demonstrations, and laboratories. Completion of the course requires mastery of a group of core units. Testing on these units is primarily by oral examination. The final grade is determined by performance on the core units, the laboratories and additional materials, and the final examination. Students who object to dissecting live animals may want to take another biology course. Students who have already had training equivalent to the portion of the regular course that is to be omitted may register in this manner. May not be substituted for 100-level courses and may not be used in fulfillment of college distribution requirements.

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 prerequisites for second- and third-year biology. Lecs, M W F 9:05-9:15, 10:10-10:20, 10:25-10:35. Labs, M W F 9:05 or 10:10, lab, M T W R or F 2:425 or T 10:10-12:35. Students do not choose lab sections during course enrollment; lab assignments are made during first day of classes. Each student must attend lab on alternate weeks. Evening prelims: fall, Sept. 26 and Nov. 7; spring, Feb. 27 and Apr. 3. R. Turgeon, C. Eberhard. Students who desire level 1 biology may take this broad introductory course in modern biology. It is not a course in social biology but addresses itself to biological principles with academic rigor. It is recommended to appeal to anyone who seeks a comprehensive knowledge of biology as part of a general education. Laboratory sections enable small groups of students to meet with the course staff and are used for problem-solving experiments, demonstrations, and discussions.
307 Basic Immunology, Laboratory (also Veterinary Medicine 316) Fall. 2 credits. Prerequisite: a course in basic microbiology or permission of instructor. Required of students. Prerequisites: Microbiology 290 and 291. Recommended: Biological Sciences 307. Lecs, T 12:15; labs, T 12:15-2:15. Evening seminar: T 20:15. G. D. W. Dunn, P. Pollock, E. L. Winter.

A course in medical microbiology. Lectures discuss the 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 experimentation process through the use of laboratory animal models and tissue cultures.

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. Semester seminars led by staff. 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, and Plant Biology. Topics and instructors are listed in the division's catalog supplement issued at the beginning of the semester.

459 Biology of Parasitism (also Veterinary Medicine 787) Spring. 2 credits. Prerequisite: one year of introductory biology for majors. Recommended: Biological Sciences 261 (360) or 262 (260) or equivalent. S-U grades optional. Offered alternate years. Lecs, M. W. 12:20-1:40. Staff.

An exploration of the biology of parasitism, with emphasis on the ecological and evolutionary aspects of host-parasite interactions. Topics include the evolution of host-parasite systems, the ecology of parasitism, structural and physiological adaptations for parasitism, and the ecology of parasitic disease. The course is suitable for upper-division undergraduates and graduate students with interests in parasitology, ecology, and human or veterinary medicine.

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. Staff. Designed to give qualified undergraduate students teaching experience through actual involvement in planning and assisting in biology courses. This experience may include supervised participation in a discussion group, assisting in a biology laboratory, assisting in field biology, or tutoring. Biological sciences courses course in the biological sciences field. Such experience include Biological Sciences 105-106, 231, 274, 311, 319, 330, 430, 468, and 475.

499 Undergraduate Research in Biology Fall or spring. Variable credit. Variable credit. Students in the College of Arts and Sciences may not register for more than 8 credits. Fall only. Prerequisite: written permission of staff member who supervises the work and assigns the grade. Each student must submit an independent study statement describing 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 advisors. Limited to undergraduate students. Limited to 4 credits of research may be used in completion of the division requirement. Staff. Practice in planning, conducting, and reporting independent laboratory and library research programs. Research credits may not be used in completion of the scientific research requirements 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 1-4, 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 and lab to be arranged. M. V. Parthasarathy, M. V. Parthasarathy.

A general introduction to the principles and the proper use of the scanning electron microscope. Emphasis is on using the instrument to observe biological specimens and on the appropriate use of preparing biological material for scanning electron microscopy.

602 Advanced Electron Microscopy for Biologists I Spring, weeks 1-3. 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, T 12:25-4:25. M. V. Parthasarathy.

High-resolution electron microscopy, problems of obtaining high-resolution electron micrographs of biological specimens, and visualization of macromolecules.

603 Electron Microscopy for Biologists Fall. 3 credits. Primarily for graduate students but open to seniors who can demonstrate a need for the course. Limited to 10 students. Prerequisite: permission of instructor. S-U grades only. Lec and lab to be arranged. M. V. Parthasarathy, M. V. Parthasarathy.

Principles of electron microscopic techniques for electron microscopy, such as ultrathin sectioning, negative staining, and metal shadowing; and interpretation of results. A brief introduction to scanning electron microscopy is also included.

604 Advanced Electron Microscopy for Biologists II Spring, weeks 4-6. 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, T 12:25-4:25. M. V. Parthasarathy, M. V. Parthasarathy.

Principles of autoradiography at both light microscopic and electron microscopic levels, incorporation of radioactive material into biological specimens for autoradiography, and problems of resolution and quantitative aspects of autoradiography.

606 Advanced Electron Microscopy for Biologists III Spring, weeks 7-9. 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, T 12:25-4:25. M. V. Parthasarathy, M. V. Parthasarathy.

Principles of freeze-fracturing and freeze-substitution techniques, and freezing artifacts and interpretation of images.
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.

Lecs., T 8:30-9:55, occasional disc to be arranged. J. E. Fortune.

The structural and functional differences between the sexes are examined. Emphasis is placed on mechanisms of mammalian reproduction; 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.

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. Fall, a year of introductory biology for majors. Fee, $10.

Lecs., T R 10:10, labs, M W 1:25-5 or 7-10 p.m., or T R 1:25-5. Evening prelim: Mar. 11; 3 evening lab meetings: Mar. 25, Apr. 11, Apr. 22. R. A. Corradino, 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.

311 Introductory Animal Physiology, Lectures (also Veterinary Medicine 346) Fall. 3 credits. Prerequisites: one year of college biology, chemistry, and mathematics.


A general course in vertebrate physiology, emphasizing the basic characteristics of the circulatory, nervous, pulmonary, renal, and gastrointestinal systems; endocrinology; and reproductive physiology. Neural and hormonal control of function is emphasized. S-U grades only.

313 Histology: The Biology of the Tissues Fall. 4 credits. Prerequisite: one year of introductory biology. Recommended: background in vertebrate anatomy and organic chemistry or biochemistry.


Provides the student with a basis for understanding the microscopic, fine-structural, and functional organization of vertebrates, as well as the methods of analytic morphology at the cell and tissue levels. The dynamic interrelations of structure, composition, and function in cells and tissues are emphasized.

315 Ecological Animal Physiology, Lectures Fall. 3 credits. Prerequisite: one year of introductory biology for majors. Offered alternate years.


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 ecological adaptations of vertebrate and invertebrate animals to their environments are analyzed.

316 Cellular Physiology Spring. 4 credits. Limited to 56 students, with preference given to students concentrating in physiology, animal physiology, and anatomy. Each lab limited to 28 students. Prerequisite: concurrent or previous enrollment in Biological Sciences 330 or 331.

Lecs., M W F 10:10-11:10; lab, M or T 1:25-5. A. Quaroni, R. A. Corradino, and staff.

Lectures introduce students to the most current information on the ways cells function and regulate themselves and neighboring cells and on what molecules are involved in these regulatory processes. Laboratories provide an introduction to cell and organ culture and to immunological techniques used to study cell structure and function in vivo and in vitro. Experiments performed in the laboratory are closely related to, and provide practical experience with, subjects covered in the lectures.

317 Ecological Animal Physiology, Laboratory Fall. 1 credit. Limited to 12 students.

Prerequisite: concurrent enrollment in Biological Sciences 315. Offered alternate years. Not offered 1985-86; next offered 1987-88.


Exercises involve measurement of important environmental factors in local habitats, and laboratory experiments to familiarize students with the use of ecophysiological concepts.

319 Introductory Animal Physiology, Laboratory (also Veterinarian F Medicine 348) Fall. 2 credits. Limited to 80 students, with preference given to students concentrating in animal physiology and anatomy. Each lab limited to 40 students. Fall, a year of introductory biology and either Mathematics 106 or 111.


A series of exercises designed to illustrate basic physiological processes in animals, including mammals. Students learn scientific methodology and analyses of results by actual performance of the exercises. Reports of laboratory activities are required. Grading is based on evaluation of these reports and on laboratory performance.

351 Biological Rhythms with a Period of One Day to One Year Fall. 1 credit. Prerequisites: one year of introductory biology and either Mathematics 106 or 111.


Theoretical and practical aspects of circadian and circannual rhythms are considered. Selective topics such as the biological clock of plants, insects, and vertebrates are presented. Light is considered as a stimulus and as an entraining agent. The role of hormones in migration and reproduction is emphasized.

410 Seminar in Anatomy and Physiology Fall or spring. 1 credit. May be repeated once for credit. Limited to upperclass students. S-U grades only. Sem to be arranged. Organizational meeting first W of each semester at 7:30 p.m. in 105 Stimson Hall. Fall. K. W. Beyenbach; spring: R. H. Foote.

Discussions and seminars on specialized topics in animal physiology and anatomy. Fall: spinal cord; transport of salt and water; spring: gamete physiology and fertilization.

411 Comparative Neuroendocrinology (also Entomology 411) Fall. 3 credits. Prerequisite: Biological Sciences 311 or Entomology 483.


A comparison of the interactions of the nervous and endocrine systems in invertebrates and vertebrates from Hydra to humans. Areas covered include neuroendocrinology, endocrine physiology, endocrine morphology, and molecular biology of neuroendocrine glands and their hormones.

412 Special Histology: The Biology of the Organs Spring. 4 credits. Limited to 12 students.

Prerequisite: Biological Sciences 313 or written permission of instructor. Offered alternate years.

Lecs., W F 9:05; labs, W F 2-4:25. Staff.

A continuation of Biological Sciences 313. The microscopic and ultrastructural organization of the principal vertebrate organ systems are studied in relation to their development, functional interaction, and special physiological roles. Courses 313 and 412 together present the fundamental aspects of the microscopic and submicroscopic organization of the vertebrate. The organization of the course involves student participation in lecture-seminars and independent project work supplementary to the regular work of the laboratory. Students are encouraged to gain practical experience with histological and histochemical preparative techniques.

414 Vertebrate Morphology (also Veterinary Medicine 700) Spring. 3 credits. Prerequisite: graduate standing, or Biological Sciences 274 or equivalent. S-U grades optional.

Lec. and disc. T 10:10; lab R 1:25-4:25; additional hours to be arranged. E. L. Gasteiger.

The anatomy and physiology of the mammalian nervous system are studied through a combination of contemporary and modern laboratory studies. Sensory, central integrative, and motor functions are explored primarily by electrophysiologically recording spontaneous and evoked neural activity. Special emphasis is given to the molecular biology of neuroendocrine glands and their hormones.

450 Mammalian Neurophysiology (also Veterinary Medicine 753) Spring. 3 credits. Prerequisite: two years of college biology. Recommended: courses in physics and biochemistry.

Lecs. and disc., T 10:10, lab R 1:25-4:25; additional hours to be arranged. H. E. Evans.

Student dissections of the dog serve as the basis for a functional consideration of the major component parts of the body and its organ systems. This is followed by a discussion of the central nervous system. Other species (fish to mammal) of interest to members of the class may also be dissected.

452 Comparative Physiology of Reproduction of Vertebrates, Lectures (also Animal Science 452) Spring. 3 credits. Prerequisite: Animal Science 427 or permission of instructor.

Lecs., M W F 1:25. A. van Tienhoven.

Sex and its manifestations. Neuroendocrinology, endocrinology of reproduction, sexual behavior, gametogenesis, fertilization, development, care of the zygote, environment and reproduction, and immunological aspects of reproduction.

454 Comparative Physiology of Reproduction of Vertebrates, Laboratory (also Animal Science 454) Spring. 2 credits. Prerequisite: concurrent or previous enrollment in Biological Sciences 452 or permission of instructor.

Lab. to be arranged. Organizational meeting first F of semester at 2:30. A. van Tienhoven.

The laboratory provides students with an opportunity to design and execute independent experiments with limited objectives.

458 Mammalian Physiology Spring. 6 credits. Enrollment limited. Graduate student auditors allowed in lectures.

Prerequisite: Biological Sciences 411 or 416, or equivalent with written permission of instructor.
Lecs, M W F 8, lab. M or W 1:25-4:25; additional hours R evenings or 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 epithelial membranes, the autonomic nervous system, cardiovascular physiology, gastrointestinal physiology, renal physiology, respiration physiology, and acid-base balance.

[515 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. Not offered 1985-86.
Lectures on nutritional aspects and physiological, biochemical, and hormonal relationships of the prominent macrominerals and microminerals, with emphasis on recent developments. Information is included on methodologies of mineral research and the essentials, requirements, transport, function, homeostasis, interrelationships, and toxicity of various mineral elements.

[516 Radioisotopes in Biological Research (also Veterinary Medicine 750)] Fall. 4 credits.
Prerequisites: courses in animal or plant physiology, or permission of instructor. Offered alternate years. Not offered 1985-86.
Lecs, T R 11:15, lab, T 1:25–S. W. Lengemann.
Lectures and laboratories deal with the radioisotope as a tool in biological research. Among the topics considered are the use and detection of beta- and gamma-emitting isotopes, gamma spectrometry, Cerenkov counting, neutron activation, autoradiography, and isotope dilution. Emphasis is placed on liquid scintillation counting, double-label experiments, and C-14 and H-3 tracers. Experiments are designed to present basic principles, using plants and animals as subject material.

[518 Biological Membranes and Nutrient Transfer (also Veterinary Medicine 752)] Spring. 2 credits.
Prerequisites: courses in animal or plant physiology, quantitative and organic chemistry, and physics and permission of instructor. Recommended: courses in chemistry. S-U grades optional, with permission of instructor. Offered alternate years. Not offered 1985-86.
Lecs, T R 11:15, R. H. Wasserman.
An introduction to elementary biophysical properties of biological membranes; theoretical aspects of permeability, passive transport, and mechanism of transfer of inorganic and organic substances, primarily across epithelial membranes.

[619 Lipids (also Nutritional Sciences 602)] Fall. 2 credits. Prerequisite: Biological Sciences 330 or 331.
Lecs, T R 11:15–A. Bensadoun.
Advanced course on biochemical, metabolic, and nutritional aspects of lipids. Emphasis on critical analysis of current topics in lipid methodology, lipid absorption; lipoprotein secretion, structure, and function; lipolysis and fatty acid synthesis; and cholesterol metabolism and atherosclerosis.

[658 Molecular Mechanisms of Hormone Action (also Veterinary Medicine 758)] Spring. 2 credits.
Prerequisite: permission of instructor. Offered alternate years.
Lecs, T R 10:10, R. A. Corradino.
An advanced course developed from the current literature on endocrine mechanisms.

Fall 1985: two topics are offered.

711 Dependability of the Nervous System 1 credit.
Sem, 1 hour each week to be arranged.
E. L. Gasteiger.

717 Structure and Function of Joints with Emphasis on Arthritis 1 credit.
Lec, 1 hour each week to be arranged. G. Lust.
Spring 1986: five topics are offered (see also course description for Biological Sciences 754).

712 Development and Differentiation of Intestinal Epithelium 1 credit.
Lec and sem, 1 hour each week to be arranged. A. Quaroni.

714 Physiology of Pregnancy 2 credits.
Sem, 2 hours each week to be arranged.
R. W. Foote.

716 Seminar on Insect Physiology (also Entomology 685) 1 credit. Prerequisite: permission of instructor.
Sem, 1 hour each week to be arranged.
H. H. Hagedorn.

718 Gamele Physiology and Fertilization (also Biological Sciences 416) 2 credits.
Lec and disc, 2 hours each week to be arranged.
R. H. Foote.

719 Graduate Research in Animal Physiology (also Veterinary Medicine 600) Fall or spring. Variable credit. Prerequisites: written permission of section chairperson and staff member who supervises the work and assigns the grade. S-U grades optional.

Hours to be arranged. Staff.
Similar to Biological Sciences 499 but intended for graduate students who are working with faculty members on an individual basis.

754 New Concepts for Improving Growth, Reproduction, and Lactation in Domestic Animals 2 credits. S-U grades optional. This course may be used as a special-topics-in-physiology course by graduate students in the field of physiology.
Lec and disc, 2 hours each week to be arranged.
W. Hansel, R. A. Milvai.
A course designed to survey recent advances in biotechnology that affect growth, reproduction, and lactation and to assess their impacts on animal production practices during the next fifteen years. Subjects to be considered include uses of steroids, antibiotics, growth hormones, and other hormones to promote growth; the use of superovulation, embryonic transfer, and other techniques to improve the efficiency of reproduction; the use of growth hormones, steroid hormones, thyrotropin-releasing hormone, and other hormones and environmental factors to improve lactational performance, and the techniques for introducing new genes into embryos for improving milk production, growth, and reproduction. A lecture on each major subject area is followed by a discussion period during which attempts are made to assess the potential applications of each new technological development.

Related Courses in Other Departments

Adaptations of Marine Organisms (Biological Sciences 413)
Advanced Work in Animal Parasitology (Veterinary Medicine 737)
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)
Neuroanatomy (Veterinary Medicine 504)
Sensory Function (Biological Sciences 492)
Teaching Experience (Biological Sciences 498)
Undergraduate Research in Biology (Biological Sciences 499)
Vision (Biological Sciences 395)

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 only (registered students receive an unsatisfactory grade for nonattendance).
Lec, 10:10-11:30 for first 3 S of semester. Section chairperson and staff.
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 205 or equivalent. S-U grades optional.
Lecs, M W F 12:20, J. M. Griffiths.
A brief introductory section relating organic chemistry to biochemistry is given, followed by the biochemical material in the usual one-semester introductory courses. Topics of general interest are also included.

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. May not be taken for credit after Biological Sciences 281, 330, or 331. S-U grades optional.
Lecs and disc, M W F 11:15. J. M. Calvo, J. M. Fessenden and staff.
An attempt to give an intelligent layperson the background needed to understand some new research discoveries and applications stemming from them. Concepts from molecular biology and molecular genetics that underlie recombinant DNA technology, together with the strategies used today in cloning genes, are discussed. Examples emphasize the vital link between basic research, often esoteric in nature, and modern biotechnology. Applications to be discussed from multidisciplinary perspectives include insulin, interferon, blood-clotting factors, growth hormones, vaccines, screening for genetic diseases, feed-stocks chemicals, and plant improvement. Scientific, historical, regulatory, social, and ethical issues form the basis of the discussions.

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.
Discs, M W F or 10:10; additional hours to be arranged. No formal lecs. Evening prelim to be arranged. Fall: M. F. Fenger, R. E. MacDonald, and staff; spring: M. F. Fenger, 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 and monographs. Grades above the C level are evaluated critically during six or seven two-hour meetings. Fall to-cell communication, functions and interactions of the cell cycle, macromolecular growth factors, cell-surface properties, cell cytoskeleton, transcription and translation of papovavirus and retrovirus genes, and structure and function of viral and cellular oncogenes.

431 Principles of Biochemistry, Lectures Fall or 6-week summer session. 4 credits (or 2 credits if taken after Biological Sciences 231). Prerequisite: Chemistry 233 or 356 or equivalent. May not be taken for credit after Biological Sciences 330.


Chemistry of biological substances, presented in a 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 laboratory, and permission of instructor. Students must present permission of instructor by preregistering in 229 Stimson Hall.


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 in an enzymology module 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 or 6-week summer session. 3 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent.

Lecs, M W F 11:15. M. V. Hinkle 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, oncogenicity and the immune system. The material is covered in depth in Biological Sciences 438, 483, 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 written permission of instructor. S-U grades optional, with permission of instructor.

Sem to be arranged. Organizational meeting first W of each semester at 4 p.m. Fall: J. M. Calvo; spring: E. B. Keller.

Selected papers from the literature on a given topic are evaluated critically during six or seven two-hour meetings. Fall: amino acid gene expression during differentiation; spring: cellular oncogenes.

[438 Cell Proliferation and Oncogenic Viruses (also Toxicology 438) Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331. Recommended: Biological Sciences 281. Not offered 1985-86.


A description of the growth properties of animal cells in culture, focusing on discussions of the changes in cells that are induced by tumor viruses and carcinogens. Topics include immortalization of cells, the cell cycle, macromolecular growth factors, cell-surface properties, cell cytoskeleton, transcription and translation of papovavirus and retrovirus genes, and structure and function of viral and cellular oncogenes.]

630 Laboratory in Cell Biology Spring. 4 credits. Enrollment limited. Prerequisites: a course in biochemistry or cell biology, and permission of instructor.

Labs, M W 1:25-4:25 or R 9:05-4:25; disc to be arranged. J. Gibson and staff.

The course emphasizes 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. Credit given for S-U grades optional, with permission of instructor.


Lectures on protein structure and the nature of enzymatic catalysis. Discussions cover some of these areas in more depth, through recent research papers.

632 Membranes and Bioenergetics Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent.


Structure of biological membranes, membrane systems, receptors, ion-transport enzymes, oxidative phosphorylation, and photophosphorylation. Together with Biological Sciences 638 and 639, this course provides broad coverage of the cell biology subject area.

633 Biosynthesis of Macromolecules Fall. 2 credits. Prerequisite: Biological Sciences 330 or 331.


Synthesis of DNA, RNA, and proteins; regulation of gene expression.

634 Biochemistry of the Vitamins and Coenzymes (also Nutritional Sciences 634) Spring. 2 credits. Prerequisites: Biological Sciences 330 or 331 or equivalent and another Chemistry 358 or 360. Offered alternate years.


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 1985-86.


Lectures on the identification and characterization of regulatory steps in metabolism, considered from both theoretical and practical aspects. The intracellular mechanisms of regulation are emphasized, 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, receptor-mediated processes, 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.

Lecs, M W F 9:05. Evening prelims to be arranged. W. J. Anon.

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 contexts of selected physiologic and pathologic stresses.

638 Intermediate Biochemical Methods Spring. 4 credits. Primarily for graduate students minoring in biochemistry and undergraduates concentrating in biochemistry. Enrollment limited to 72 students. Admission to the course is contingent 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 in the fall. In the interview the student is asked about all chemistry and biochemistry courses taken and the credit for each. May not be taken for credit after Biological Sciences 430.

Lab, T W or R 9:05-4:25. L. A. Heppel and staff.

Selected experiments on proteins, enzymes, DNA, and bioenergetics to illustrate basic biochemical properties. The course emphasizes qualitative aspects and techniques currently used in biochemical research.

639 Molecular Biology of the Cell: Inside the Nucleus Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent.

Lecs, M 8-9:55 p.m. J. T. Lee.

Lectures on topics of eucaryotic gene organization, regulation of gene expression, RNA processing, chromatin structure, the structure and movement of chromosomes, and the architecture of the nucleus. Together with Biological Sciences 632 and 636, this course provides broad coverage of the cell biology subject area.

648 Plant Biochemistry Spring. 3 credits. Prerequisites: organic chemistry, biochemistry, and a course in plant physiology. Offered alternate years. Not offered 1985-86.


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.

650 Nitrogen Metabolism (also Nutritional Sciences 650) 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 is devoted to fixation and assimilation, and the metabolism and biological importance of purines, pyrimidines, porphyrins, alkaloids, and amines. This is followed by discussions 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 higher animals. Emphasis throughout the course is on hormonal, developmental, and molecular biological aspects of metabolic regulation and evolutionary differences.
659 Chemicals, Risks, and Values (also Toxicology 659) Fall 2 credits. Prerequisites: Biological Sciences 330 or 331 and Nutritional Sciences 331 or equivalent, or permission of instructor. S-U grades optional. Offered 1985-86 and 1986-87; thereafter offered alternate years.

Sem, T 2:30-4:25, J. M. Fessenden-Raden. Selected cases of chemical risk management by government agencies, communities, industries, and individuals are reviewed in the context of the generation, use, and presentation of scientific data and information to policy makers. The role(s) 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. A paper is required.

731-736 Current Topics in Biochemistry Fall or spring. ½ or 1 credit for each topic. May be repeated for credit. (Students registering 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 1985: three topics are offered.

731 Membrane and Other Properties of Normal and Transformed Cells ½ credit.
T R 12:20 (6 lecs), Sept. 3-18, L. A. Heppel.

733 Mechanism of Action of Oncogenes ½ credit.

735 Biochemistry and Biophysics of Vision ½ credit.
T R 12:20 (6 lecs), Oct. 23-Nov. 8, A. Lewis.

Spring 1986: three topics are offered.

732 NMR Theory for Biologists 1 credit.

734 Reconstitution of Transporters, Receptors, and Pathological States ½ credit.

736 Molecular Basis of Sickle Cell Disease ½ credit.
T R 12:20 (6 lecs), Apr. 15-May 1, S. J. Edelstein.

[751 Dilemmas for Toxicologists and Other Scientists (also Toxicology 751)] Fall. 2 credits. Prerequisites: advanced graduate standing and permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985-86; next offered 1987-88.

Sem, T 2:30-4:25, J. M. Fessenden-Raden. Case studies of dilemmas faced by practicing scientists in toxicological, chemical, and biochemical fields in academia, industry, and government, with discussions of possible approaches, alternatives, and outcomes. Readings of scientific, ethical, and general papers provide background for discussions. Topics for consideration include laboratory safety, data presentation, legal liabilities, communicating with the public, conflicts of interest/commitment, secrecy in science, imposed regulations on science, and professional codes of ethics.

[752 Isotope Kinetics (also Nutritional Sciences 682)] Spring. 2 credits. Prerequisite: one year of calculus. Recommended: some knowledge of differential equations. S-U grades only. Offered alternate years. Not offered 1985-86.

Lec, T 7:30-9:30 p.m., D. B. Zilversmit. Quantitative analysis of the transport and distribution of nutrients, metabolites, and drugs in multicompartamental systems. The material is presented as lectures, discussion groups, and problem sets.

830 Biochemistry Seminar Fall or spring. No credit.
Sem, F 4-15, Staff.
Lectures on current research in biochemistry, presented by distinguished visitors and staff members.

831 Advanced Biochemical Methods I Fall. 6 credits. Limited to graduate students majoring in biochemistry. Labs and disc. 12 hours each week to be arranged. Organizational meeting first R of semester at 10:10. D. B. Wilson and staff.
To learn the basic techniques of biochemical research, each student completes a set of experiments.

832 Advanced Biochemical Methods II Spring. 6 credits. Limited to graduate students majoring in biochemistry. S-U grades only.
Lab to be arranged. Staff (coordinator: graduate faculty representative).
Research in the laboratories of two or three different professors chosen by the student. Arrangements are made jointly between the graduate field representative and the research adviser.

833 Research Seminar in Biochemistry Fall and spring. 1 credit each term. (Students must register for 2 credits each term, since an "R" grade is given at the end of the fall term.) May be repeated for credit. Required of, and limited to, second-, third-, and fourth-year graduate students majoring in biochemistry. S-U grades only.
Each student presents one seminar per year on his or her thesis research and then meets with instructors and thesis committee members for evaluation.

Related Courses in Other Departments

Lipids (Biological Sciences 619 and Nutritional Sciences 602)

Molecular Aspects of Development (Biological Sciences 483)

Molecular Mechanisms of Hormone Action (Biological Sciences 558 and Veterinary Medicine 758)

Teaching Experience (Biological Sciences 498)

Undergraduate Research in Biology (Biological Sciences 499)

Botany

241 Plant Biology 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, vegetable crops, and wildlife. Prerequisite: one year of introductory biology for majors or equivalent. Lecs, T R 9:05, lab, M T W R or F 1:25-4:25, or M L 1:10-3:10 p.m., H. P. Banks.
Introductory botany for those who plan to specialize in, or use some aspect of, the plant sciences. Emphasizes structure, reproduction, and classification of angiosperms and the history of life on earth. Laboratory emphasizes development of skills in handling plant materials, including identification. First and second weeks of laboratory are field trips, starting with the first day of classes. Those who register for an evening laboratory are still required to attend the afternoon field trips.

242 Plant Physiology, Lectures Spring. 3 credits. Primarily for undergraduates in agricultural sciences. Prerequisites: one year of introductory biology and introductory chemistry. Concurrent enrollment in Biological Sciences 244 or written permission of instructor required for undergraduates. May not be taken for credit after Biological Sciences 341 except by written permission of instructor.

Lecs, M W R 10:10, J. D. Davies. Plant physiology and applied plants growing in communities. Examples deal with crop plants or higher plants where possible, though not exclusively. Topics include cell structure and function; plant metabolism, including photosynthesis; soil-plant-water relations; water transport; transpiration; irrigation of crops; sugar transport; mineral nutrition of crops; respiration and photosynthesis; light relations in crops, growth and development—hormones, flowering, fruiting, dormancy, and abscission; and chemical control of plant growth.

244 Plant Physiology, Laboratory Spring. 2 credits. Prerequisite: concurrent enrollment in Biological Sciences 242. May not be taken for credit after Biological Sciences 242.

Disc and lab, M T W R or F 12:20-4:25, C. Reiss. 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.

246 Ethnobotany Spring, 2 or 3 credits (3 credits with laboratory). Limited to 20 students. Prerequisite: written permission of instructor.

Lecs, T R 11:15, lab, R 2-4:25, D. M. Bates.
A consideration of the role of plants in primitive and lay societies, with emphasis on the nature of the plant resource base, the manner in which man uses this base, and the extent to which it enters his folklore and has influenced cultural development. The laboratory is required for the 3-credit option and provides a practical introduction to the plant kingdom by emphasizing plant organization and identification and plant crafts.

341 Plant Physiology, Lectures Fall. 3 credits. Prerequisites: one year of introductory biology, organic chemistry, and either concurrent enrollment in Biological Sciences 349 or written permission of instructor. May not be taken for credit after Biological Sciences 344 unless written permission is obtained from instructor.

Lecs, T R 10:10 and M 7:30 p.m., A. T. Jagendorf.
The behavior, growth, transport processes, and environmental responses of plants. Topics include, membrane properties, solute and water transport, and function of osmotic forces; mineral and organic nutrition; stress resistance; growth and development controls; metabolism, including photosynthesis and respiration; and responses to environmental influences.

342 Taxonomy of Cultivated Plants (also Floriculture and Ornamental Horticulture 342) Spring. 4 credits. Prerequisite: one year of introductory biology or written permission of instructor. May not be taken for credit after Biological Sciences 343.

A study of ferns and seed plants, their relationships, and their classification into families and genera, emphasizing cultivated plants. Particular emphasis is placed on gaining proficiency in identifying and distinguishing families and in preparing and using analytic keys. Attention is also given to the economic importance of taxa, to the basic taxonomic literature, and to the elements of nomenclature.

343 Taxonomy of Vascular Plants Fall. 4 credits. Prerequisites: one year of introductory biology and written permission of instructor. May not be taken for credit after Biological Sciences 342.

Lecs and discs, T R 9:05, labs, M W or T R 2-4:25, Staff.
An introduction to the classification of vascular plants, with attention to principles, methods of identification, and literature. Field trips are held during laboratory periods in the first half of the term.
345 Plant Anatomy Fall. 4 credits. Limited to 48 students. Prerequisite: one year of introductory biology for a semester of botany.
Lecs, M W 9:05; labs, M W or F 2-4:25. D. J. Paolillo.
A descriptive course with equal emphasis on development and mature structure. Lecture, laboratory, and reading are integrated in a study guide. The laboratory offers the opportunity to develop the practical skills required to make anatomical diagnoses and to write anatomical descriptions.

[347 Cytology Fall. 4 credits. Prerequisite: one year of introductory biology for majors. Recommended: Biological Sciences 281. Not offered 1985-86.
Lecs, M W 9:05; labs, M W or F 10:10-12:35. D. J. Paolillo.
The life histories of Bryophytes, vascular cryptogams, and seed plants are examined in terms of their bearing on concepts of evolution and group relationships. The course content is designed to develop an awareness of the integration between morphology and other disciplines in biology.]

[445 Photosynthesis (also Applied and Engineering Physics 601) Fall. 3 credits. Prerequisites: Chemistry 104 or 208, Mathematics 106 or 111, and either Physics 102 or 208 or permission of instructor. Offered alternate years. Not offered 1985-86.
Lecs, T R 8-9:30. J. D. Doyle.
The study of the 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. Emphasis is placed on the impact of recombinant DNA technology on plant systems, 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.

448 Plant Evolution and the Fossil Record Spring. 3 credits. Prerequisite: Biological Sciences 241 or equivalent or written permission of instructor. Offered alternate years.
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 ecocetic settings, and evolutionary theory as it relates to plants.

464 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.
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.

[646 Families of Tropical Flowering Plants: Field Laboratory Intersession 3 credits. Limited to 20 students, with preference given to graduate students from member institutions of the Organization for Tropical Studies. Prerequisite: Biological Sciences 342 or 343 or equivalent. Recommended: Biological Sciences 245. S-U grades only. For more details and application, contact L. H. Bailey Hortorium, 467 Mann Library. Offered alternate years. Not offered 1985-86.
Bailey Hortorium staff.
An intensive orientation to families of tropical flowering plants represented in forests of the American tropics. Emphasis on field identification combined with laboratory analysis of available materials in a "whole-biology" 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 only.
Lectures and discussions led by staff, visitors, and selected students on topics of contemporary importance to systematic botany.

[684 Plant Biochemistry Spring. 3 credits. Prerequisites: organic chemistry, biochemistry, and a course in plant physiology. Offered alternate years. Not offered 1985-86.
Selected areas of plant biochemistry are reviewed in the context of the plant life cycle and response 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 formation and properties. Attention is paid to operation of control mechanisms.

685 Transport of Solutes and Water in Plants Fall. 3 credits. Prerequisite: Biological Sciences 341 or equivalent. Offered alternate years.
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. Prerequisites: introductory physics, calculus, and plant physiology. S-U grades only. Offered alternate years. Not offered 1985-86. Lecs, T R 10:10-11:30. R. M. Spanwick. An exploration of the extent to which physiological processes and their interactions can be formulated in a quantitative manner and integrated to describe various aspects of plant behavior, including growth and yield. Consideration is given to characterization of the plant environment, energy balance, gas exchange, water relations, photosynthesis, respiration, translocation, nutrient supply, and the timing of developmental events.]

[652 Botanical Latin Fall. 1 credit. Prerequisite: written permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985-86. Lec and disc to be arranged. W. J. Dress. Basic grammar and vocabulary and exercises in writing and reading the Latin of plant taxonomy, as well as applications to botanical nomenclature.]

[654 Plant Nomenclature Fall. 1 credit. Prerequisite: written permission of instructor. Recommended: concurrent enrollment in Biological Sciences 652. S-U grades optional. Offered alternate years. Not offered 1985-86. Lec and disc to be arranged. R. P. Kor. An analysis of the International Code of Botanical Nomenclature and its application to various plant groups.]

[656 Topics in Paleobotany Spring. 1 credit. Prerequisite: Biological Sciences 448 or equivalent backgound in evolution or written permission of instructor. Lab and disc to be arranged. K. J. Niklas. A series of selected topics to provide a background in plant evolution, paleobotanical literature, and evolutionary theory. Among the topics discussed are the origin of a terrestrial flora, the evolution of the angiosperms.]

[657 Literature of Taxonomic Botany Fall. 1 credit. Prerequisite: written permission of instructor. S-U grades optional. Offered alternate years. 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 for one level of 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. Hours to be arranged. Staff. Similar to Biological Sciences 499 but intended for graduate students who are working with faculty members on individual basis.]

[840 Current Topics in Plant Physiology Fall or spring. 2 credits. May be repeated for credit. S-U grades only. Sen to be arranged. Staff. Seminar reports by graduate students on current literature in experimental plant physiology or related areas.]

Related Courses in Other Departments

Field Phycology (Biological Sciences 441)
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. 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. Staff. Principles concerning the interactions between organisms and their environment; influence of competition, predation, and other factors on population size and its variability. Analysis of population structure and growth; processes of speciation; interspecific competition and the niche concept; succession and community concepts; influence of climatic and past events on the diversity and distribution 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 262. Lecs, T R 11:15; disc, T or R 1:25, 2:30, or 3:35. Staff. An introduction to biological phenomena that occur at the population, community, and ecosystem levels of organization. The relevance of ecological principles to current environmental and resource problems is examined.

283 Field Ecology Fall. 2 credits. Prerequisite: concurrent or previous enrollment in Biological Sciences 261 or 262. Lec, R 11:15; lab, F 12:20-5. P. L. Marks, R. B. Root. 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 and competition 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 1:25-5 or 7-10 p.m., or T R 1:25-5. Evening prep: Mar. 11; 3 evening lab physicals to be arranged. A. R. McCune 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. Lecs, M W F 10:10. K. A. R. Kennedy, J. D. Haas, R. Dyson-Hudson. 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 adaptations 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 such as creatism, the Plitdown fraud, the sociobiology debate, genetic engineering, race and IQ, and racism are presented as examples of current issues in human biology.

315 Ecological Animal Physiology, Lectures Fall. 3 credits. Prerequisite: one year of introductory biology for majors. Offered alternate years. Lecs, M W F 10:10. W. N. 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.

317 Ecological Animal Physiology, Laboratory Fall. 1 credit. Limited to 12 students. Prerequisite: concurrent enrollment in Biological Sciences 315. Offered alternate years. Not offered 1985-86. Lab, W or R 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. Lecs, M W F 2:30; lab, 1 hour 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 contexts, 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 demonstration, T 10:10-12:05 and R 10:10; disc, R 11:15. 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 speciation occur, and the resultant major patterns of organic diversity.

455 Insect Ecology, Lectures (also Entomology 455) Fall. 2 credits. Prerequisites: Biological Sciences 261 and Entomology 212 or their equivalents. Recommended: concurrent enrollment in Biological Sciences 457. Offered alternate years. Lecs, W F 11:15. R. B. Root. Ecological and evolutionary principles are integrated by thorough examinations 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, 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. Lab, W 1:25-4:25, plus F or 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.
461 Oceanography Fall. 3 credits. Prerequisites: college physics and either Biological Sciences 261 or 262, or written permission of instructor. S-U grades optional. Not offered 1985-86. Lec, T R 10:10; additional lec, R 12:20; alternating with disc, T or R 1:25. Staff. A general introduction to the oceans, with emphasis on physical and chemical processes that interact with marine communities. Discussions use case studies from current literature to illustrate application to problems in biological oceanography.

462 Limnology, Lectures Spring. 3 credits. Prerequisite: Biological Sciences 261 or 262 or written permission of instructor. Lec, M W F 11:15. N. G. Hurston. A study of the interaction of biological communities and their aquatic environment. The physical, chemical, and biological dynamics of freshwater ecosystems.

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 463 or equivalent background in plant sciences. Lec, M W F 11:15. Staff. Principles of plant-environment interactions in relation to the evolution, distribution, structure, and functioning of plants and plant communities.

464 Limnology, Laboratory Spring. 2 credits. Prerequisite: concurrent or previous enrollment in Biological Sciences 462. Lab, T W R or F 1:25-4:25; 1 weekend field trip. Staff. Field trips and laboratories devoted to studies of aquatic ecosystems.

465 Plant Ecology, Laboratory Fall. 1 credit. Prerequisite: concurrent enrollment in Biological Sciences 463 or equivalent background in plant ecology. Lab, F 12:05-5. Staff. Laboratory and field exercises in plant ecology. Field studies of plant communities and techniques for the analysis of community data are emphasized.

469 Agriculture, Society, and the Environment (also Agriculture and Life Sciences 469 and Biology and Agriculture 469) Spring. 3 credits. Prerequisite: one year of introductory biology or permission of instructor. Lec, T R 12:20; disc, M 1:25 or T 10:10. D. Pimentel and others. 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, energy use, 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. Offered alternate years. Fee, $15. Lecs, M W F 9:05; lab, M or T 1:25-4:25; 1 weekend field trip required. Staff. Lectures on the evolution, classification, distribution, and adaptations of mammals. Laboratory and fieldwork on systematics, ecology, and natural history of mammals of the world, with primary emphasis on the North American fauna. Systematics laboratories held in the museum at Research Park.

473 Herpetology Fall. 4 credits. Recommended. Biological Sciences 274. S-U grades optional, with permission of instructor. Offered alternate years. Fee, $5. Lecs and labs, T R 12:20-4:25; occasional field trips and special projects. F. H. Pough. Lectures cover various aspects of the biology of amphibians and reptiles, including evolution, zoogeography, ecology, behavior, and physiology. Laboratory includes systematics, functional morphology, and behavior.

474 Laboratory and Field Methods in Human Biology Fall. 2 credits. Recommended: concurrent or previous enrollment in Biological Sciences 462. Lab, T W R or F 1:25-4:25; 1 weekend field trip. Staff. Laboratory and field exercises in human biology. Field studies of human communities and techniques for the analysis of human community data are emphasized.

475 Ornithology Fall. 4 credits. Recommended: Biological Sciences 274. S-U grades optional, with permission of instructor. Offered alternate years. Not offered 1985-86. Fee, $15. Lecs and labs, T R 10:10-12:05; additional hours to be arranged. Independent research project required. K. A. Kendeigh. Practical exercises and demonstrations of modern approaches to the methodology of physical anthropology. Emphasis on comparative human anatomy, the human paleontological record, description of skeletal and living subjects, paleopathology, skeletal maturation, and relevant field techniques for the archaeological and forensic anthropologist.


667 Limnology Seminar Fall. 1 credit. May be repeated for credit. Primarily for graduate students; permission of instructor required for undergraduates. S-U grades optional. Not offered 1985-86. Staff. A seminar course on advanced limnological topics.

669 Plant Ecology Seminar Spring. 1 credit. May be repeated for credit. Primarily for graduate students; permission of instructor required for undergraduates. S-U grades optional. Not offered 1985-86. Staff. A seminar course on advanced limnological topics.

670 Environmental Science (also Geology 670) Fall and spring. 2 or 3 credits each term. Limited to 12 students. Prerequisite: permission of instructor. Sem, W 12:20. D. Pimentel. This course uses an interdisciplinary approach to focus on complex environmental and energy problems. Ten to twelve students, representing several disciplines, investigate significant energy and environmental problems. The research team spends two semesters preparing a report for publication, modeled after National Academy of Sciences reports.


686 Seminar in Coevolution of Insects and Plants (also Entomology 686) Spring. 2 credits. Intended for seniors and graduate students. Limited to 15 students. Prerequisites: courses in entomology, ecology, evolution, and organic chemistry and written permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985-86. Staff. A seminar course on advanced limnological topics.

699 Plant Ecology Seminar Spring. 1 credit. May be repeated for credit. Suggested for students majoring or minoring in plant ecology. S-U grades optional. Staff. A seminar course on advanced limnological topics.
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 optional. Sem to be arranged. Fall: R. M. Dawley, E. M. Dawley, spring; vertebrate biology staff. Seminar presentations and discussions by students on areas of current research in vertebrate biology. Topics vary from semester to semester.

[673 Human Evolution: Concepts, History, and Theory  Fall. 3 credits. Prerequisite: one year of introductory biology or Anthropology 214 or permission of instructor. Offered alternate years. Not offered 1985-86. Sem, W 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)  Spring. 4 credits. Limited to 15 students. Prerequisite: permission of instructor. Recommended: an introductory biological systematics course. Lecs, M W 1:25, labs, M W 2:30-4:25, disc to be arranged. Q. D. Wheeler and staff. An introduction to modern theory and methods of systematic biology. Lectures are on theoretical systematics and include species concepts, classification, phylogenetics, and biogeography. Laboratories include modern methods of analysis of data, including cladistic hand and computer methods and numerical methods. Laboratory grade is based in part on a final paper.

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 study. A survey of special topics of current interest. Content varies and is arranged between student and staff member.

[761 Seminar in Population and Community Ecology  Spring. 1 credit. May be repeated for credit. Prerequisite: permission of instructor. S-U grades optional. Not offered 1985-86. Sem, T 4:25. Staff. A seminar course on selected topics in population and community ecology. Topics vary from year to year.]

765 Autecology/Population Ecology  Fall. 4 credits. Prerequisite: Biological Sciences 261 or equivalent. S-U grades optional. Lecs, T 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 organismal 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.

766 Communities and Ecosystems  Spring. 4 credits. Prerequisite: Biological Sciences 261 or equivalent. Lecs, T 10:10-12:05. Staff. Structure, dynamics, and evolution of natural communities; species diversity; niches 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 Parasitology (Veterinary Medicine 510)  
Biological of Parasitism (Biological Sciences 459 and Veterinary Medicine 787)  
Biological of PlantSpecies (Biological Sciences 442)  
Early People: Human Cultural and Biological Evolution (Anthropology 203 and Archaeology 203)  
Ecology and Human Biology (Anthropology 375)  
Marine sciences courses (Biological Sciences 363-370, 467, 477)  
Phylogeny (Biological Sciences 348)  
Plant Geography (Biological Sciences 440)  
Plant Nematology (Plant Pathology 373)  
Related courses in entomology (Entomology 212, 331, 352, 370, 453, 471, 621, 631, 633, 634, 636, 672)  
Related courses in natural resources (Natural Resources 302, 430, 603)  
Soil Microbiology, Lectures (Agronomy 476)  
Systematics and the Bioinonics of AnimalParasites (Veterinary Medicine 332)  
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)  
Vertebrate Social Behavior (Biological Sciences 427)  

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. Lecs, T R 10:10-12:05; lab, M W or R 2:30-4:25; additional hours to be arranged. Labs may also be scheduled T or R 8:00-12:05; 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. J. J. Buus, T. R. Fox, M. L. Goldberg, R. J. Macnryney. A general study of the fundamental principles of genetics in eucaryotes and procaryotes. Discussions of gene transmission, gene action and interaction, gene linkage and recombination, gene structure, and gene and chromosome mutations, genetic aspects of differentiation, genes in populations, breeding systems, and extrachromosomal inheritance. Aspects of DNA recombinant technology are discussed. In the laboratory, students perform experiments with microorganisms and conduct an independent study of inheritance in Drosophila.

282 Human Genetics  Spring. 3 credits. Each disc limited to 25 students. Prerequisite: one year of introductory biology or equivalent. Students who have taken Biological Sciences 281 may register only with written permission of instructor. Lecs, M W 10:10, disc, R or F 10:10 or 11:15. Staff. An introduction to human 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. Lecs, M W F 11:15, K. J. Kempfhus. An introduction to the morphogenetic, cellular, and genetic aspects of the developmental biology of animals.

389 Embryology  Spring. 4 credits. Prerequisites: one year of introductory biology and a knowledge of mammalian adult anatomy. Limited to seniors. Lecs, T R 10:10; labs, T R 2-4:25. A. W. Blacklar. 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. Not offered 1985-86. Lecs, M W 10:10. Staff. A study of factors that influence the genetic structure of Mendelian populations and that are involved in race formation and speciation.]

483 Molecular Aspects of Development  Spring. 3 credits. Prerequisites: Biological Sciences 281, 330 or 331, and 385, or permission of instructor. Offered alternate years. Lecs, T R 10:10-11:45. M. F. Wolfsen. 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 translational controls, nucleo-cytoplasmic interactions, and genetic responses to hormone treatment.

484 Molecular Evolution  Spring. 3 credits. Prerequisites: Biological Sciences 281 and organic chemistry. Offered alternate years. Lecs, 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 the molecular level is critically examined. Theories on the evolution of the genetic code and the construction of phylogenetic trees from biochemical data are discussed.

485 Microbial Genetics, Lectures  Fall. 2 credits. Limited to upperclass and graduate students. Prerequisites: Biological Sciences 281 and Microbiology 290, or written permission of instructor. S-U grades optional. Lecs, W 7:30-9:25 p.m. S. A. Zahler. Genetics of bacteria and viruses, with emphasis on the mechanisms of genetic phenomena.

486 Immunogenetics (also Animal Science)  Spring. 4 credits. Enrollment limited. Prerequisites: Biological Sciences 281 or Animal Science 221, and a course in immunology or permission of instructor. Lecs, M W F 10:10; disc, W or R 12:20. R. R. Dietert.
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 are discussed.

487 Microbial Genetics, Laboratory Fall. 3 credits. Primarily for upperclass students. Limited to 18 students. Prerequisites: concurrent or previous enrollment in Biological Sciences 485, Microbiology 291 or equivalent, and written permission of instructor. Lab. T 1:25-4:25, additional hours to be arranged. S. A. Zahier.

Problem solving in bacterial genetics.

688 Genetics of Unicellular Eucaryotes Spring. 1 credit. Prerequisites: Biological Sciences 281, 330 or 331, and 485, or written permission of instructor. S-U grades optional.


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 juniors 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)

Current Topics in Biochemistry (Biological Sciences 731-736)

Cytogenetics (Biological Sciences 446)

Cytology (Biological Sciences 347)

Organic Evolution (Biological Sciences 378)

Physiological Genetics of Crop Plants (Plant Breeding 605)

Plant Growth and Development (Biological Sciences 644)

Reproduction and Development of Marine Invertebrates (Biological Sciences 482)

Teaching Experience (Biological Sciences 498)

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 permission given to students concentrating in neurobiology and behavior. Not open to freshmen. Prerequisite: one year of introductory biology for majors. May be taken independently of Biological Sciences 222. S-U grades optional.

Lecs, M W F 12:20; disc to be arranged. P. W. Sherman and staff.

A general introduction to the field of behavior and integrative neuroscience. Topics include evolution and behavior, behavioral ecology, chemical ecology, altruism, communication, neuroethology, rhythmicity, orientation and navigation, and neural 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 permission given to students concentrating in neurobiology and behavior. Not open to freshmen. Prerequisite is 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. R. R. Capranica 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, and 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.

Lecs, T R 10:10-11:30; P. W. Sherman; disc to be arranged. E. Adkins Regan, 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 or Psychology 123, 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.

[395 Vision (also Applied and Engineering Physics 611) Fall. 3 credits. Prerequisites: Chemistry 104 or 208, Mathematics 106 or 111, and Physics 102 or 208, or permission of instructor. Offered alternate years.

Lecs, M W F 12:20; disc to be arranged. S. T. Emlen.

A comprehensive survey of current research in vision, with emphasis on the biophysical bases of visual function.

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 physics or biophysics, and a second course in neurobiology or behavior or perception or cognition or psychobiology; students are expected to have elementary knowledge of perception, neuroscience, 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 12:20; disc to be arranged. K. K. Adler.

This course is taught in the Socratic method, in which the instructor asks questions of the students. Students read, analyze, and discuss in class 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, visual Channels, and chemoreceptors) is selected for special attention. At the level of An Introduction to the Physiology of Hearing, by J. O. Pickles; Photoreceptors: Their Role in Vision, by A. Fein and E. Z. Szuts; Comparative Studies in Hearing in Vertebrates, edited by A. N. Popper and R. R. Ray; and "Information Processing in Cutaneous Mechanoreceptors," Federation Proceedings 42:1993-1994.

425 Sensitivity to Neurobiology and Behavior Fall or spring. Variable credit. May be repeated for credit. Primarily for undergraduates. S-U grades optional. Sem to be arranged. Staff.

In most semesters, at least two seminars on different topics are offered. Topics and instructors are listed in the division's catalog supplement issued at the beginning of the semester.

424 Neuroethology Fall. 3 credits. Prerequisites: Biological Sciences 221 and 222. S-U grades optional for graduate students only. Offered alternate years.


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, electrophysiological and electrophysiological techniques, communication, neurobehavior of vision 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 recording, and interfacing to an experiment.

[427 Vertebrate 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. Not offered 1985-86.

Lecs and disc, T R 2:30-4:20; P. W. Sherman, S. T. Emlen.

An intensive course for upper-division students interested in the adaptive bases of social behavior. Lectures, discussions, and student 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 nepotism.

428 Mechanisms of Behavior: Animal Orientation and Navigation Spring. 2 credits. Prerequisite: Biological Sciences 221.

Lecs, 2 hours each week to be arranged. K. K. Adler.

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] Olfaction and Taste: Structure and Function (also Psychology 429) Fall. 3 credits. Prerequisite: A 300-level course in biology or equivalent. S-U grades optional. Offered alternate years. Not offered 1985-86.

Lecs, T R 9:05; B. P. Halfpenny.
The structural and functional characteristics of olfaction 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 function are discussed. The emphasis of the course is on vertebrates, especially air-breathing vertebrates in the context of all animals, 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.

Lecs, T R 10:10; lab, M or W 12:20-4:25; additional hours arranged.

A lecture and laboratory course designed to teach the theory and techniques of electrophysiological study of the nervous system. Topics include electrical modeling of cells, intracellular and extracellular recording, and analysis of laboratory data.

[492] Sensory Function (also Psychology 492) Spring. 4 credits. Prerequisite: Biological Sciences 222 or an upper-level course in electrophysiology or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985-86.

Lecs, M W F 10:10; disc, 1 hour each week to be arranged. H. C. Howland, B. P. Halfpenny.

Classical topics in sensory function such as vision, hearing, touch, and balance, as well as some more modern topics, including sensory coding, location of stimulus, and experimental analysis of 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 1985-86.

Lecs and disc, M W F 9:05; T. Eisner, J. Meinwald, W. L. Rorback, and guest speakers.
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. Not offered 1985-86.

Lecs and disc, M W F 9:05; T. Podlesky.

This course is an introduction to neurobiochemistry. The presynaptic regulation and postsynaptic mechanism of action of the major classes of neurotransmitters are discussed, as well as selection and expression of receptors. Study of molecular and gene cloning techniques that are used to analyze these topics are discussed. The relevance of basic mechanisms to normal brain function and to neurological disorders are described. Readings are primarily from journal articles.

[622] Laboratory in Neural Systems and Behavior Fall. 3 credits. Limited to 6 students concentrating in neurobiology and behavior. Prerequisites: Biological Sciences 221, 222, and 491, and permission of instructor. Admission to the course requires a personal interview with the instructor. Offered alternate years. Not offered 1985-86.

Lecs and labs, 7 hours each week to be arranged. R. R. Hoy and lab staff.

A series of research-oriented exercises dealing with the neural basis of behavior. Techniques in anatomy, physiology, and behavior are taught. The experimental manipulation of invertebrate animals in which a cellular analysis is feasible.

623 Chemical Communication (also Chemistry 524) 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. Rorback, and guest speakers.
The production, transmission, and reception of chemical signals in communicative 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 F 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.

690 Advanced Topics in Integrative Neurobiology 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. Offered alternate years.

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.

691 Advanced 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, physiological, and behavioral approaches to studies of vertebrate and invertebrate behavior.

695 Physiological Optics Fall. 3 credits. Limited to 24 students. Recommended: courses in elementary biology or psychology, and physics, and courses in another area of interest (see below). Offered alternate years. Not offered 1985-86.

Lecs, T R 9:05; lab, F 1:25-4:25; H. C. Howland.
The course is primarily for upperclass students who intend to pursue research or conduct clinical work in vision. Topics include geometrical optics, clinical refraction, n-measurement of MTF and contrast sensitivity, and the vegetative physiology of the eye related to vision. Laboratory work is divided into three tracks:

(1) clinical track, for students intending to work in optometry or medicine;
(2) psychophysical track, for students intending to conduct research in human or animal vision;

and (3) engineering track, for students intending to use or design optical devices for which the human eye is a component of the system.

Grades are based on the student's accomplishments within the chosen track in view of the background brought to it.

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.

Sem to be arranged. Staff.

A seminar for several small groups each year, intended for students who have taken 492 and who may meet for whatever period is judged adequate to enable coverage of the selected topics. Ordinarily, topics are selected and circulated during the preceding semester. Suggestions for topics should be submitted by faculty or students to the chairperson of the Section of Neurobiology and Behavior.

721 Graduate Survey of Behavior Fall. 1 credit. Limited to graduate students. Concurrent registration in Biological Sciences 221 is not required. S-U grades optional.

Sem to be arranged. P. W. Sherman and staff.

A survey course involving readings of the original literature in behavior. A weekly seminar, primarily in the form of student-led discussion groups, is held to discuss readings linked to the material presented in Biological Sciences 221.

722 Graduate Survey of Neurobiology Spring. 1 credit. Limited to graduate students. Concurrent registration in Biological Sciences 222 is not required. S-U grades optional.

Sem to be arranged. R. R. Capranica and staff.

A survey course involving readings of the original literature in neurobiology. A weekly seminar, primarily in the form of student-led discussion groups, is held to discuss readings linked to the material presented in Biological Sciences 222.

723 Advanced Topics 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.

Sem to be arranged. Staff.

A seminar on a specific topic in animal behavior. The instructor presents lectures during the first few course meetings; the remainder of the course is devoted to student presentations. 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.

Sem 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.

790 Advanced Topics in Cellular and Molecular Neurobiology Fall or spring. Variable credit. May be repeated for credit. Primarily for 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. Topics are selected by the faculty member in charge each semester. Suggestions for topics may be submitted by faculty or students to the chairperson of the Section of Neurobiology and Behavior.
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 are carried on in the Cornell Marine Programs Office, in G14 Stimson Hall. The office serves as an advising center for students interested in the marine sciences, maintains a browsing library with updated information on graduate study and career opportunities as well as on marine programs at other institutions, and administers the SEA Semester, a 17-credit program offered in cooperation with the Sea Education Association.

The following marine sciences courses are currently administered by the Cornell Marine Programs Office.

306 Marine Microbiology Summer. 2 credits. Prerequisites: one year of introductory college biology and chemistry. Recommended: an introductory course in microbiology. 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, G14 Stimson Hall. Estimated cost includes tuition, room and board, and ferry transportation, $765.

308 Marine Biology for Teachers Summer. 1 credit. Primarily for teachers, grades 6 through 12, but open to others. Prerequisite: one year of introductory college biology. S-U grades optional. A special 10-day course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portland, ME. For more details and application, consult the SML office, G14 Stimson Hall. Estimated cost includes tuition, room and board, and ferry transportation, $875.

363 Marine Biology for Teachers Summer. 1 credit. Primarily for teachers, grades 6 through 12, but open to others. Prerequisite: one year of introductory college biology. S-U grades optional. A special 10-day course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portland, ME. For more details and application, consult the SML office, G14 Stimson Hall. Estimated cost includes tuition, room and board, and ferry transportation, $875.

364 Field Marine Science Summer. 6 credits. Prerequisite: one year of college biology. S-U grades optional. A special 4-week course offered 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, G14 Stimson Hall. Estimated cost includes tuition, room and board, and ferry transportation, $3,425.

365 Underwater Research Summer. 2 credits. Prerequisites: one year of college-level biology or other supporting subject. S-U grades optional. A special 2-week course offered each summer at Cornell's Shoals Marine Laboratory (SML), on an island off Portland, ME. For more details and application, consult the SML office, G14 Stimson Hall. Estimated cost includes tuition, room and board, and ferry transportation, $575.

366 SEA Introduction to Oceanography Summer. 3 credits. Prerequisites: a laboratory course in physical or biological science and concurrent enrollment in Biological Sciences 367 and 368. A survey of the characteristics and processes of the global ocean. Oceanography, nautical science, and maritime history, law, literature, and art necessary to understand the political and economic problems of contemporary maritime affairs.

367 SEA Introduction to Maritime Studies Summer. 3 credits. Prerequisites: one year of college-level biology or other supporting subject. S-U grades optional. A special 2-week course offered each summer at Cornell's Shoals Marine Laboratory (SML), on an island off Portland, ME. For more details and application, consult the SML office, G14 Stimson Hall. Estimated cost includes tuition, room and board, and ferry transportation, $575.

368 SEA Introduction to Nautical Science Summer. 3 credits. Prerequisites: a laboratory course in physical or biological science and concurrent enrollment in Biological Sciences 367 and 368. A survey of the characteristics and processes of the global ocean. Oceanography, nautical science, and maritime history, law, literature, and art necessary to understand the political and economic problems of contemporary maritime affairs.

SEA Semester (six weeks)

Courses 369 and 370 take place aboard the R/V Westward. Students must take the entire sequence. For more details and application, consult the Cornell Marine Programs Office, G14 Stimson Hall. Program costs are to be paid in place of regular Cornell tuition and fees: tuition for the entire 17-credit SEA Semester, about $4,600; room and board for the sea component (six weeks) only, about $900.

Instructors for the SEA Semester include faculty of the SEA and the Woods Hole Oceanographic Institution and others.

Shore Component (six weeks)

366 SEA Introduction to Oceanography 3 credits. Prerequisites: a laboratory course in physical or biological science and concurrent enrollment in Biological Sciences 367 and 368. A survey of the characteristics and processes of the global ocean. Oceanography, nautical science, and maritime history, law, literature, and art necessary to understand the political and economic problems of contemporary maritime affairs.

367 SEA Introduction to Maritime Studies 3 credits. Prerequisites: an introductory course in physical or biological science and concurrent enrollment in Biological Sciences 366 and 367. An interdisciplinary consideration of 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 3 credits. Prerequisites: a laboratory course in physical or biological science and concurrent enrollment in Biological Sciences 366 and 367. An introduction to the technologies of operation at sea. The concepts of navigation (piloting, celestial, and 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, steering, 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 stay-sail schooner built in 1961. Westward normally puts to sea with a ship's company of thirty-four. The professional staff of nine includes the chief scientist, two science watch officers, three deck watch officers, an engineer, and a steward. In addition, 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 364. Theories and problems raised in the shore component are tested in the practice of oceanography. Field trips, laboratory sampling and analysis. Includes tests of salinity, temperature, pH, chlorophyll, alkalinity, total CO₂ nutrients, organic material, and suspended materials in coastal waters, with some work on the analysis of coastal sediments.

477 Topics in Marine Vertebrates Summer. 4 credits. Prerequisites: 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, G14 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $1,095.

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 parameters from otolith microstructure, teleost skeleton morphology and function, and the role of biology and behavior of Maine fishery. Mesoziic marine reptiles, the biology of sea turtles in cold water, coloniality in sea birds, avian adaptations to life at sea, evolution and systematics of marine mammals, diving physiology, and ecology and conservation of existing marine mammal populations.

482 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, G14 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $1,070.

Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

A laboratory-oriented course emphasizing processes of fertilization and early development through the metamorphosis of larvae in species selected from an extensive variety of local marine invertebrates. Practical experience includes collecting specimens intertidally and from the plankton, culturing embryos through metamorphosis, camera lucida and photomicrographic recording of embryonic development, and design and execution of basic experimental embryology courses. A complement laboratory work through phylogenetic examination of classical invertebrate embryology and modern experimental developmental biology.

Archaeology of Maritime Communities (Archaeology 350: Individual Study in Archaeology) Summer 1 credit. Prerequisite: Archaeology 319 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, G14 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $435.

Daily lecs, labs, and fieldwork for 1 week. SML faculty.

Focusing on various land sites and their adjacent offshore marine environments. Artifact analysis, preliminary conservation, and the proper recording of finds are emphasized. Methods of archaeological excavation, including the use of 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 Oceanic Law and Policy (Natural Resources 390) Summer. 3 credits. 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, G14 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $415.

Daily lecs and discs for 1 week. SML faculty.

Resource economics in general is concerned with the timing of use 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 318) 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 Cocco’s Shoals Marine Laboratory. (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, G14 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $435. Daily labs, labs, and fieldwork for 1 week. SML faculty.

An introduction to the subject and a review of this contemporary subdiscipline of archeology. 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 archeological 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.

Wetland 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, G14 Stimson Hall. Estimated cost (includes tuition, room and board, and ferry transportation), $415. 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 successional features, 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 biological sciences major (see option 8 under “Concentration Areas and Requirements”). Information on this independent option is available in the Office for Academic Affairs, 118 Stimson Hall. Students interested in graduate work in biophysics should inquire at the Program in Biophysics office, 491.

Membranes and Bioenergetics (Biological Sciences 623)

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

(Vision (Biological Sciences 395 and Applied and Engineering Physics 611)

Faculty Roster

New York State College of Agriculture and Life Sciences

Adler, Kraig K., Ph.D., U. of Michigan. Prof., Neurobiology and Behavior

Barker, Robert P., Ph.D., U. of California at Berkeley. Prof., Biochemistry, Molecular and Cell Biology

Bates, David M., Ph.D., U. of California at Los Angeles. Prof., Biophysics

Beyenbach, Klaus W., Ph.D., Washington State U. Assoc. Prof., Physiology/Veterinary Physiology

Bruns, 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/Cornell Plantations

Davies, Peter J., Ph.D., U. of Reading (England). Prof., Plant Biology

Doyle, Jeffrey J., Ph.D., Indiana U. Asst. Prof., Bailey Hortorium

Edelstein, Stuart J., Ph.D., U. of California at Berkeley. Prof., Biochemistry, Molecular and Cell Biology

Eisner, Thomas, Ph.D., U. of Harvard. Jacob Gould Schurman Professor, Neurobiology and Behavior

Emlen, Stephen T., Ph.D., U. of Michigan. Prof., Neurobiology and Behavior


Fox, Thomas D., Ph.D., Harvard U. Asst 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. Asst Prof., Genetics and Development

Hanson, Maureen R., Ph.D., Harvard U. Assoc. Prof., Genetics and Development

Harris-Warrick, Ronald M., Ph.D., Stanford U. Asst 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, Andre 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 J., Ph.D., Indiana U. Asst Prof., Genetics and Development

Lis, John T., Ph.D., Brandeis U. Assoc Prof., Biochemistry, Molecular and Cell Biology

Loew, Ellis R., Ph.D., U. of California at Los Angeles. Assoc. Prof., Physiology/Veterinary Physiology

McCarty, Richard E., Ph.D., Johns Hopkins U. Prof., Biochemistry, Molecular and Cell Biology

McCune, Amy R., Ph.D., Yale U. Asst Prof., Ecology and Systematics

MacDonald, Russell E., Ph.D., U. of Michigan. Prof., Biochemistry, Molecular and Cell Biology

McIntyre, Ross J., Ph.D., Johns Hopkins U. Prof., Genetics and Development

Marks, Peter L., Ph.D., Yale U. Assoc. Prof., Ecology and Systematics

Moffat, J. Keith, Ph.D., U. of Cambridge (England). Assoc. Prof., Biochemistry, Molecular and Cell Biology

Nasarallah, June B., Ph.D., Cornell U. Asst Prof., Plant Biology


Paolillo, Dominick J., Jr., Ph.D., U. of California at Davis. Prof., Plant Biology

Panzer, Marc V., Ph.D., Cornell U. Prof., Plant Biology

Pough, F. Harvey, Ph.D., U. of California at Los Angeles. Prof., Ecology and Systematics/Physics

Quaroni, Andrea, Ph.D., U. of Pavia (Italy). Asst. Prof., Physiology

Roberts, Jeffrey W., Ph.D., Harvard U. Assoc. Prof., Biochemistry, Molecular and Cell Biology

Root, Richard B., Ph.D., U. of California at Berkeley. Prof., Ecology and Systematics/Entomology

Sapir, Stephen, Ph.D., U. of California at San Diego. Prof., Plant Biology

Tye, Bik-Woong, Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Biochemistry, Molecular and Cell Biology

Uni, Natalie W., Ph.D., Cornell U. Assoc. Prof., Bailey Hortorium

Vogt, Volker M., Ph.D., Harvard U. Assoc. Prof., Biochemistry, Molecular and Cell Biology

Walcott, Charles, Ph.D., Cornell U. Prof., Neurobiology and Behavior/Laboratory of Ornithology

Whalen, Michael D., Ph.D., U. of Texas at Austin. Assoc. Prof., Bailey Hortorium/Ecology and Systematics

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. Sr. Lecturer, Biochemistry, Molecular and Cell Biology

Dawley, Ellen M., Ph.D., U. of Connecticut. Instructor, Ecology and Systematics

Dawley, Robert P., Ph.D., U. of Connecticut. Instructor, Ecology and Systematics

Ecklund, P. 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. Lecturer, Neurobiology and Behavior

Griffiths, Joan M., Ph.D., Cornell U. Lecturer, Biochemistry, Molecular and Cell Biology

Hess, John B., Ph.D., Cornell U. Lecturer, Ecology and Systematics

Hinkle, Maja V., Ph.D., New York U. Medical School. Lecturer, Biochemistry, Molecular and Cell Biology

Land, Bruce R., Ph.D., Cornell U. Sr. Lecturer, Neurobiology and Behavior

McFadden, Carol H., Ph.D., Cornell U. Lecturer, Physiology

Reiss, H. Carol M.S., Cornell U. Lecturer, Plant Biology


Wilkinson, Maria L., Ph.D., Cornell U. Lecturer, Biochemistry, Molecular and Cell Biology
Joint Appointees

Bedford, Barbara L., Adjunct Asst. Prof., Ecosystems Research Center/Ecology and Systematics
Bloom, Stephen E., Assoc. Prof., Poultry and Avian Sciences/Biological Sciences
Borror, 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
Fote, Robert H., Jacob Gould Schurman Professor, Animal Science/Physiology
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
Richmond, Mila E., Assoc. Prof., USDA Fish and Wildlife Service/Natural Resources/Ecology and Systematics
Szaiz, Aladar A., Adjunct Asst. Prof., Boyce Thompson Institute/Biological Sciences
Thompson, Jonathan F., USDA Science and Education Administration/Plant Biology
VanDemark, Paul J., Prof., Microbiology/Biological Sciences
van Tienhoven, Ari, Prof., Poultry and Avian Sciences/Physiology
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
Bass, Andrew H., Ph.D., U. of Michigan. Asst. Prof., Neurobiology and Behavior
Blacktor, Antonie W., Ph.D., U. of London (England). Prof., Genetics and Development
Bretschler, Anthony P., Ph.D., Leeds U. (England). Asst. Prof., Biochemistry, Molecular and Cell Biology
Brown, William F., 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
Capanica, Robert R., Sc.D., Massachusetts Inst. of Technology. Prof., Neurobiology and Behavior
Chabot, Brian F., Ph.D., Duke U. Assoc. Prof., Cell Biology and Systematics
Feigelson, Gerald W., Ph.D., California Inst. of Technology. Assoc. Prof., Biochemistry, Molecular and Cell Biology
Fessenden-Raden, June M., Ph.D., Tufts U. Assoc. Prof., Biochemistry, Molecular and Cell Biology/Program on Science, Technology, and Society
Fortune, Joanne E., Ph.D., Cornell U. Asst. Prof., Physiology/Women's Studies/Veterinary Physiology
Gibson, Quentin H., Ph.D./D.Sc., Queen's U. (Northern Ireland). Greater Philadelphia Professor in Biological Sciences; Biochemistry, Molecular and Cell Biology
Helmsen, Bruce P., Ph.D., Brown U. Prof., Neurobiology and Behavior/Physiology
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 R., Ph.D., Stanford U. Assoc. Prof., Neurobiology and Behavior
Kennedy, Kermit 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
Rabinowitz, Deborah, Ph.D., U. of Chicago. Assoc. Prof., Ecology and Systematics
Racker, Efraim, 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 J., Ph.D., U. of Michigan. Assoc. Prof., Neurobiology and Behavior
Surgeon, Robert B., Ph.D., Carleton U. (Canada). Asst. Prof., Plant Biology
Wilson, David B., Ph.D., Stanford U. Prof., Biochemistry, Molecular and Cell Biology
Wolfner, Mariana F., Ph.D., Stanford U. Asst. Prof., Genetics and Development
Wy, 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
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
Tapper, Daniel N., Ph.D., Cornell U. Prof., Physiology/Veterinary Physiology/Veterinary Physiology/Neurobiology and Behavior
Wasserman, Robert H., Ph.D., Cornell U. Prof., Physiology/Veterinary Physiology/Neurobiology and Behavior

Joint Appointees

Bergman, Emmett N., Prof., Veterinary Physiology/Physiology
Dobson, Alan, Prof., Veterinary Physiology/Physiology
Duny, Gary M., Asst. Prof., Microbiology/Genetics and Development
Evans, Howard E., Prof., Anatomy/Biological Sciences
Gillespie, James H., Prof., Microbiology/Biological Sciences
Houp, Katherine A., Assoc. Prof., Veterinary Physiology/Physiology
Houp, T. Richard, Prof., Veterinary Physiology/Physiology
Kaufelt, Francis A., Prof., Clinical Sciences/Veterinary Physiology/Physiology
Kazarian, Michael N., Asst. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Zilversmit, Donald B., Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology

Division of Biological Sciences

Stinson, Harry T., Jr., Ph.D., Indiana U. Prof., Biological Sciences/Genetics and Development

Division of Nutritional Sciences

Joint Appointees

Arion, William J., Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Bensaoud, Andre, Prof., Nutritional Sciences/Physiology
Kazarian, Michael N., Asst. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Watford, Malcolm, Asst. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Zilversmit, 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.
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.

Graduate programs, which are administered by the Graduate School, are described in the Announcement of the Graduate School and the special Announcement Graduate Study in Engineering and Applied Science. Two programs that are closely related to undergraduate study in the College of Engineering—the Master of Engineering degree program and a special master’s degree program that combines studies in engineering and in business administration—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
- Geological 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, 156 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.

Course Category Credits
1) Mathematics 16
2) Physics 12
3) Chemistry 4
4) Freshman Seminar 6
5) Computer programming (plus one approved course in computing applications) 4
6) Engineering distribution (4 courses) 12
7) Humanities and social sciences (6 courses) 18

*To major in agricultural engineering, students enroll in the College of Agriculture and Life Sciences for the first and second years, and jointly in that college and the College of Engineering for the third and fourth years.

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 of 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 241; 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
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 353 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. Students in the Field Program in Engineering Physics may substitute EE 310 or Mathematics 471 for Engr 260.

5) Electrical sciences
   Engr 210, Introduction to Electrical Systems
   Engr 214, 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 102, 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 four 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 (c). This selection 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. 98, group 2b and group 3a) as well as the following:
   - History of Art: all courses numbered 200 and above
   - Music: all introductory courses (except 122) and all theory and history courses
   - Theater Arts: all history, literature, and theory courses, and all film courses except 377 and 477.

b) Social Sciences
   This category includes all courses defined by the College of Arts and Sciences as social sciences (see pp. 97-98, 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 317, 318, 319, 320.
   - College of Engineering: Civil and Environmental Engineering 321, 322, 325; Computer Science 305; Mechanical and Aerospace Engineering 302.
   - School of Hotel Administration 111, 281, 282
   - 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. 98, 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.

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 individuals 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 before matriculation.

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. Those acquainted with calculus may receive assistance in developing a coherent program from professors in the proposed major and minor subject areas. If approved, the program is the curricular contract to which the student must adhere.

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. Those acquainted with calculus may receive assistance in developing a coherent program from professors in the proposed major and minor subject areas. If approved, the program is the curricular contract to which the student must adhere.

Engineering Cooperative Program
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 interested 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.

Dual Degree Option
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Sophomores in the upper half of their class are eligible to apply for the co-op program. Applicants are interviewed by representatives of cooperating companies and select their work assignments from any 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 for the term six with their classmates and then undertake a second work assignment with the same company the following summer. Co-op students 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.

Master of Engineering Degree Program

One-year Master of Engineering (M.Eng.) programs are offered in eleven fields. These programs are discussed in this Announcement in connection with the corresponding upperclass engineering field programs because the curricula are integrated. Cornell baccalaureate engineering graduates frequently continue their studies in the M.Eng. program, although the program is also open to qualified graduates of other schools. The eleven M.Eng. degrees and the academic areas under which they are described are listed below:

- M.Eng.(Aerospace): Mechanical and aerospace engineering
- M.Eng.( Agricultural): Agricultural engineering
- M.Eng.(Chemical): Chemical engineering
- M.Eng.(Civil): Civil and environmental engineering
- M.Eng.(Computer Science): Computer science
- M.Eng.( Electrical): Electrical engineering
- M.Eng.(Engineering Physics): Applied and engineering physics
- M.Eng.(Materials): Materials science and engineering
- M.Eng.(Mechanical): Mechanical and aerospace engineering
- M.Eng.(Nuclear): Nuclear science and engineering
- M.Eng.(OR&E): Operations research and industrial engineering

A new program allows candidates for a professional master's degree to specialize in manufacturing systems engineering. This specialization, which is attested by a Dean's Certificate at the time of graduation, may be centered in fields leading to degrees designated as Chemical, Electrical, Mechanical, or OR&E.

Cornell engineering graduates in the upper half of their class will be admitted to M.Eng. programs; however, requirements for admission vary by field. Other applicants must have a baccalaureate degree from an engineering program accredited by the Accreditation Board for Engineering and Technology or its equivalent, in an area of engineering or science that is judged appropriate for the proposed field of study. They must also present evidence of undergraduate preparation equivalent to that provided by a Cornell undergraduate engineering education, a transcript, two letters of recommendation, and a statement of academic purpose. A candidate who is admitted with an undergraduate background that is judged inadequate must make up any deficiencies in addition to fulfilling the regular course requirements for the degree. Applicants from foreign countries must submit the results of the Graduate Record Examinations aptitude tests and must have an adequate command of the English language. Application forms and further information are available from the Office of the Graduate Professional Programs Committee, 109 Hollister Hall.

Cooperative Programs with the Johnson Graduate School of Management

Two programs culminate in both Master of Engineering and Master of Business Administration degrees. One, which students enter during their undergraduate career, makes it possible to earn the B.S., M.Eng., and M.B.A. in six years—one year less than such a program would normally require. The other program, which is available to students who already hold baccalaureate degrees from Cornell or other institutions, five semesters and leads to both the M.Eng. and M.B.A.

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 Graduate 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 placement examinations, which are given during orientation week before fall-term classes begin. Advanced placement is granted only after the completion of these examinations and is 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 the student the same subject area or enrollment in additional nontechnical elective courses.
2) In a few cases, students may receive enough AP credit to complete a B.S. degree requirements 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 course or college 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 standing. 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 with 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, unsatisfactory 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 1989, every student must attain a grade of at least C- in Mathematics 192, 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 graded scale, may be selected only in the following circumstances. Students wishing to take a course on an S-U basis must have completed 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 Academic Procedures and Policies 257
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 without 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 either a summer job or permanent 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 Agriculture 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 15
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 special-problems courses
Biological or agricultural sciences 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 student's 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) soils and water 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 (varmal) 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; geological 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 science, geophysics, 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 provides the fundamentals of science and engineering and gives the student direct exposure to the application of these fundamentals. Laboratory experimentation is emphasized, and students are expected to develop designs. Innovative design is provided. Examples are A&EP 110, The Laser and Its Applications in Science, Technology, and Medicine (a freshman course); A&EP 264, Computer-aided Instrumentation Design (a sophomore course); A&EP 365, 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 field program, outlined below, as well as the requirements of the Common Curriculum.

Course Credits

A&EP 333, Mechanics of Particles and Solid Bodies 4
A&EP 355, Intermediate Electromagnetism 4
A&EP 356, Intermediate Quantum Mechanics 4
A&EP 361, Introductory Quantum Mechanics 4
A&EP 363, Electronic Circuits 4
A&EP 423, Statistical Thermodynamics 4
A&EP 434, Continuum Mechanics 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

*Courses that will satisfy this requirement are Physics 444, Undergraduate 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 a required course, a credit in quantum mechanics is required.

Free and technical electives need not be all formal course work; qualified students may undertake informal study under the direction of a member 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, high-energy and elementary particle physics, atomic physics, geophysics, biophysics, nuclear
structure physics, nuclear engineering, 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 specialization 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 might 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 a unique opportunity to explore upper-level and graduate 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 B. R. Kusse.

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 microstructure 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 science; 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 both areas. All students must have completed the degree will have demonstrated competence in an appropriate core of basic physics, if this has not been accomplished at the undergraduate level. Courses emphasized are 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 or their equivalent, 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 correlated 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, engineering economics, business, physical geology, or bioengineering). 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. Rhodin.

Chemical Engineering


Bachelor of Science Curriculum

The undergraduate Field Program in Chemical Engineering consists of a core and a correlated sequence of courses beginning in the sophomore year and extending through the fourth year. Special programs in biochemical engineering and polymer 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:

Term 3
Math 293, Engineering Mathematics 3
Phys 213, Electricity and Magnetism 4
Chem 287-289, Physical Chemistry (approved elective) 5
Chem E 219 (engineering distribution course) 3
Humanities or social sciences course 3

Term 4
Math 294, Engineering Mathematics 4
Phys 214, Optics, Waves, and Particles 4
Chem 288-290, Physical Chemistry Engineering distribution course 5
Humanities or social sciences course 3

Term 5
Chem 357, Organic Chemistry† 3
Chem 251, Organic Chemistry Laboratory 2
Chem E 313, Chemical Engineering Thermodynamics 4
Chem E 323, Fluid Mechanics 3
Humanities or social sciences course 3

Term 6
Chem 356, Organic Chemistry‡ 3
Chem E 324, Heat and Mass Transfer 3
Chem E 332, Analysis of Separation Processes 4
Chem E 390, Reaction Kinetics and Reactor Design 3
Humanities or social sciences course 3

Electives

Chem E 101, Nonresident Lectures 0
Chem E 432, Chemical Engineering Laboratory 3
Chem E process or systems electives 3
Electives* 6
Humanities or social sciences course 3

Term 8
Chem E 462, Chemical Process Synthesis 4
Chem E 671, Process Control 3
Electives* 3
Humanities or social sciences course 3

*The electives in terms seven and eight comprise 6 credits of technical electives and 6 credits of free electives.
†Chemistry 253 plus an applied science elective may be substituted for Chemistry 357-358. Applied science electives include Biological Sciences 330 and 331, Principles of Biochemistry, Chem E 672, Adsorption and Catalysis, MS&E 331, Structure and Properties of Materials; MS&E 332, Electrical and Magnetic Properties of Materials; MS&E 441, Microprocessing of Materials; Microbiology 290, General Microbiology Lectures; any A&EP course numbered 333 or above; any chemistry course numbered 301 or above; any physics course numbered 300 or above.

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. A design project is involved in the required courses. General admission and degree requirements are described in the college's introductory section.

The following courses are included in the program:

Fall term
Chem E 563, Process Equipment Design and Selection 3
Chem E 651, Numerical Methods in Chemical Engineering 3
Technical electives 9

Spring term
Chem E 564, Design of Chemical Reactors and Multiphase Systems 3
Chem E 671, Process Control 3
Chem E 566, Design Project 3 or 6
Technical electives 3 or 6

Civil and Environmental Engineering

School of Civil and Environmental Engineering: P. Gergely, director; C. A. Shoemaker, 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 instruction in analysis, behavior, and design of structures; structural materials; and geotechnical engineering. Within the Department of Environmental Engineering there are six subject areas: environmental quality engineering, fluid mechanics and hydrology, public systems and environmental systems engineering, remote sensing, transportation, and water resources planning and analysis.

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>Course</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 I</td>
<td>4</td>
</tr>
<tr>
<td>CEE 341, Introductory Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CEE 351, Environmental Quality Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CEE 361, Introduction to Transportation</td>
<td>3</td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
</tr>
<tr>
<td>CEE 371, Structural Behavior</td>
<td>4</td>
</tr>
<tr>
<td>CEE distribution courses (four courses selected from four of the seven different subject areas of CEE)</td>
<td>12</td>
</tr>
</tbody>
</table>

*These courses can also be used to satisfy the Common Curriculum requirements for engineering distribution courses.

†Chem 208 can be substituted for Phys 214.

‡Engr 241 can be used to satisfy both the computer application requirement and an engineering distribution requirement of the Common Curriculum.

**Engr 270 can be substituted for CEE 304 by petition.

Master of Engineering (Civil) Degree Program

The M.Eng.(Civil) degree program is designed to prepare students for professional practice in civil and environmental engineering. Requirements, in addition to the general ones for the degree (see the introductory section under College of Engineering), include three required courses: one in professional engineering practice and two in design. (CEE 501 and 502). The design sequence requires the completion of a project involving synthesis, analysis, decision making, and application of engineering judgment, much of which includes an intensive, full-time, three-week session between semesters.

The remainder of a student's program of study is designed individually in consultation with an academic adviser and then submitted to the school's Professional Degree Committee for approval. The objectives in course planning are to provide breadth in the fundamentals of civil and environmental engineering, and specialization in 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 additional course work in the graduate program 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 in conjunction with the Johnson Graduate School of Management offers a six-year, joint program leading to the degrees of Bachelor of Science, Master of Engineering, and Master of Business Administration. Participating students receive the baccalaureate degree after four years and the two professional master's degrees in the next two years. Applications for this joint program must be submitted at the beginning of the sixth term of study.

Computer Science


Bachelor of Science in Computer Science

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 particular area are ordinarily advised to major in the area of application and take elective course work in computer science.

A student entering the Field Program in Computer Science must take CS 211 and CS 280 before beginning the upperclass sequence. Students who do not earn a grade of B- or better in both CS 211 and CS 280 are strongly advised against attempting the computer science field program. Students who have not maintained an average of at least 3.0 in the mathematics courses required by the Common Curriculum are also discouraged from entering the program. Apart from these requisites and those of the college, the courses required for the Field Program in Computer Science are:

<table>
<thead>
<tr>
<th>Course Work</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems Analysis</td>
<td>8</td>
</tr>
<tr>
<td>CS 310, Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>CS 314, Systems and Organization</td>
<td>3</td>
</tr>
<tr>
<td>Theory sequence</td>
<td>8</td>
</tr>
<tr>
<td>CS 381, Theory of Computing</td>
<td>3 or 4</td>
</tr>
<tr>
<td>CS 382, Analysis of Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>Numerical Analysis</td>
<td>3 or 4</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 290, Digital Systems*</td>
<td>7 or 8</td>
</tr>
<tr>
<td>Computer science electives</td>
<td>14</td>
</tr>
<tr>
<td>Two computer science courses numbered 400 or above.* One must be a course or coursework-laboration that includes a substantial programming project—for example, CS 412, 414-415, 417, or 432-433</td>
<td>3</td>
</tr>
<tr>
<td>Related electives</td>
<td>14</td>
</tr>
<tr>
<td>One mathematically oriented course plus three courses forming a coherent sequence in operations research, electrical engineering, or another technical area</td>
<td>3</td>
</tr>
<tr>
<td>EE 230 also counts as an approved elective.</td>
<td></td>
</tr>
</tbody>
</table>

*Except CS 415, 433, 600, and seminar courses.

The performance of students in the Field of Computer Science is reviewed each term. To remain in good standing with the department, they must have an overall average term of at least 2.3 with no courses failed and a term average for field-program courses of at least 2.7 with no course grade less than C- and they must be making satisfactory progress in the field.

Cooperative Program with the Johnson Graduate School of Management

Undergraduates majoring in computer science may be interested in a program that can lead, in the course of six years, to B.S., M.Eng.(Computer Science), and M.B.A. degrees. 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, however, if all requirements are to be completed on schedule.

For further 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, on theory of algorithms and theory of computation, on numerical analysis, or 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, the design of a compiler for a large subset of a general-purpose programming language.

Electrical Engineering


Bachelor of Science Curriculum

Reflecting the large scope of this engineering discipline, the undergraduate Field Program in Electrical Engineering provides a broad foundation in a number of important areas in addition to specialization in one or more.

Students can choose, for example, to concentrate in bioengineering; computer engineering; control systems; electronic circuit design; information, communications, and decision theory; microwave electronics; plasma physics; power and energy systems; quantum and optical electronics; radio and atmospheric physics; or semiconductor devices and applications.
in addition to courses taken to satisfy the common curriculum requirement, the electrical engineering Bachelor of Science curriculum requirements are as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 210, Introduction to Electrical Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 230, Introduction to Digital Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE 301, Electrical Signals and Systems I</td>
<td>4</td>
</tr>
<tr>
<td>EE 303, Electromagnetic Theory I</td>
<td>4</td>
</tr>
<tr>
<td>EE 306, Fundamentals of Quantum and Solid-State Electronics</td>
<td>4</td>
</tr>
<tr>
<td>EE 315, Electrical Laboratory I</td>
<td>4</td>
</tr>
<tr>
<td>EE 316, Electrical Laboratory II</td>
<td>4</td>
</tr>
<tr>
<td>Electrical engineering electives (at least 6)</td>
<td>19</td>
</tr>
</tbody>
</table>

*Engineering distribution course.

Satisfactory completion of EE 230 as an approved elective permits the substitution of a technical elective for this requirement.

Of the six electrical engineering electives, two courses must be selected from EE 302, 304, 310, or 435. Two must be laboratory courses.

**Credits in excess of 45 may be used to fulfill approved, technical, or free elective requirements of the Common Curriculum.

Specialization is achieved through the four senior-year electrical engineering electives, which are selected from more than sixty 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. Electives, EE 301, 303, and 315 by the end of the first semester of the junior year, and the accumulation of at least 14 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 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 Program in Geological Sciences should take Geol 201 (Engr 201) during their freshman or sophomore year. Those interested in geobiology should take Biological Sciences 101-103 and 102-104.

Geological Sciences requires six 300-level courses for the major: Geol 326, 355, 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 program 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:

A&EP 333, Mechanics of Particles and Solid Bodies
A&EP 355, Intermediate Electromagnetism
A&EP 356, Intermediate Electrodynamics
A&EP 434, Continuum Physics
T&M 301-311, Advanced Engineering Analysis I and II
T&M 450, Introduction to Continuum Mechanics

It is recommended that students intending to specialize in geophysics (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, Introductory Quantitative Analysis
Chem 301, Experimental Chemistry I
Chem 302, Experimental Chemistry II
Chem 303, Experimental Chemistry III
Chem 357-358, Intermediate Organic Chemistry
Chem 389-390, Physical Chemistry I and II
MS&E 331, Structure and Properties of Materials
MS&E 335, Thermodynamics of Condensed Systems
MS&E 336, Kinetics, Diffusion, and Phase Transformations
MS&E 443, Senior Materials Laboratory I

It is recommended that students intending to specialize in geobiology select most of their approved and technical electives from the following courses or their equivalents:

Bio S 212, Invertebrate Zoology
Bio S 241, Plant Biology
Bio S 274, The Vertebrates
Bio S 281, Genetics
Bio S 330-351, Principles of Biochemistry
Bio S 360, General Ecology
Bio S 448, Plant Evolution and the Fossil Record
Bio S 477, Organic Evolution
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, petroleum geology, 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, Identification, Appraisal, and Geography of Soils
Agron 607, Soil Physics
Agron 771, Soil Chemistry
CEE 341, Introductory Soil Mechanics
CEE 612, Physical Environment Evaluation
CEE 640, Foundation Engineering
MS&E 331, Structure and Properties of Materials
MS&E 445, Mechanical Properties of Materials
MS&E 331, Fluid Mechanics
CEE 332, Hydraulic Engineering
CEE 351, Environmental Quality Engineering
OR&E 260, Introductory Engineering Probability
OR&E 370, Introduction to Statistical Theory with Engineering Applications

Students intending to specialize in economic 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:

CCE 654, Aquatic Chemistry
CCE 741, Rock Engineering

Students who want a more general background or who want to remain uncommitted with regard to speciality 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 a senior thesis 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. A new program also permits a double major in materials science and engineering and electrical engineering. Specialization is achieved through the selection of free and technical electives in the junior and senior years. The materials science and engineering field program leading to the Bachelor of Science degree consists of the following:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS&amp;E 331, Structural Characterization and Properties of Materials</td>
<td>4</td>
</tr>
<tr>
<td>MS&amp;E 332, Electrical and Magnetic Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 333, Research Involvement I, or a field-approved elective*</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 335, Thermodynamics of Condensed Systems</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 334, Research Involvement II, or a field-approved elective*</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 336, Kinetics, Diffusion, and Phase Transformations</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 441, Microprocessing of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 443, Senior Materials Laboratory I</td>
<td>3</td>
</tr>
</tbody>
</table>
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.

Students may also obtain a Bachelor of Science degree by completing the Electronic Materials Program, which involves a double major in materials science and engineering and electrical engineering. To enter this program, which is administered by the Department of Materials Science and Engineering, students must complete Engr 210, Introduction to Electrical Systems, and Engr 262, Electrical Properties of Materials, during their sophomore year. In addition to the courses needed to satisfy the requirements of the Common Curriculum, the Electronic Materials Program requires the following:

- MS&E 445, Mechanical Properties of Materials
- MS&E 446, Microprocessing of Materials
- MS&E 448, Materials Design Concepts I
- MS&E 447, Materials Design Concepts II

In addition, the Electronic Materials Program requires two electrical engineering electives, which count as free electives in the Common Curriculum.

**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 the fundamentals of this 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 management and design, are offered in the field program.

Mechanical systems, design, and manufacturing is concerned with the design, analysis, testing, and manufacture of machinery, vehicles, devices, and systems. Particular areas of concentration include mechanical design and analysis, computer-aided design, vehicle engineering, composite materials, vibrations and control systems, biomechanics, and manufacturing engineering.

*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 331, Structural Characterization and Properties of Materials
   - M&AE 332, Electrical and Magnetic Properties of Materials
   - M&AE 335, Thermodynamics of Condensed Systems
   - M&AE 441, Microprocessing of Materials
   - M&AE 442, Macroprocessing of Materials

   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 1965 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 concentrations 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 or 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**
  - M&AE 506, Aerospace Propulsion Systems
  - M&AE 507, Dynamics of Flight Vehicles
  - M&AE 530, Fluid Dynamics
  - M&AE 531, Boundary Layers
  - M&AE 536, Turbomachinery and Applications
  - M&AE 543, Combustion Processes
  - M&AE 559, Introduction to Controlled Fusion

- **Electrical Systems** (EE 360).
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 a graduate 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 these if the courses are 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.

### 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


### 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 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&E is possible only by permission of the associate director. In addition, it is recommended that Computers and Programming (CS 211 or Engr 211) be taken before entry into the OR&E field program. Early consultation with an OR&E faculty member or with the associate director can be helpful in making appropriate choices. The required courses for the OR&E field program and the typical terms in which they are taken are as follows:

### Master of Engineering (Nuclear) Degree Program

The two-semester course in nuclear engineering 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 specific topics of 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 recommended 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 are urged to 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**

AE&EP 609, Low-Energy Nuclear Physics

AE&EP 612, Nuclear Reactor Theory I

AE&EP 633, Nuclear Engineering

Technical elective

**Spring term**

AE&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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 581</td>
<td>Digital Control Systems</td>
</tr>
<tr>
<td>AE&amp;EP 613</td>
<td>Nuclear Reactor Theory II</td>
</tr>
<tr>
<td>AE&amp;EP 652</td>
<td>Advanced Nuclear and Reactor Laboratory</td>
</tr>
<tr>
<td>AE&amp;EP 638</td>
<td>Seminar on Thermonuclear Fusion Reactors</td>
</tr>
<tr>
<td>EE 583</td>
<td>Intense Pulsed Electron and Ion Beams: Physics and Technology</td>
</tr>
</tbody>
</table>

### 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 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&E is possible only by permission of the associate director. In addition, it is recommended that Computers and Programming (CS 211 or Engr 211) be taken before entry into the OR&E field program. Early consultation with an OR&E faculty member or with the associate director can be helpful in making appropriate choices. The required courses for the OR&E field program and the typical terms in which they are taken are as follows:

### 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 develop a professional engineering design focus and have the close supervision of a faculty member. In special cases a student may petition the Master of Engineering Committee of the Sibley School of Mechanical and Aerospace Engineering for approval of 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 general objectives and a statement of the purpose of the major is submitted for approval to the Master of Engineering Committee in the school. Any subsequent changes must also be approved by this committee.
required for decision making. Students interested in the manufacturing systems engineering option and the management science option may 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>1</td>
</tr>
</tbody>
</table>

Three technical electives: 9

Spring term:

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR&amp;IE 894, Applied OR&amp;IE Colloquium</td>
</tr>
<tr>
<td>OR&amp;IE 599, Project</td>
</tr>
</tbody>
</table>

Three technical electives: 9

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 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>1</td>
</tr>
</tbody>
</table>

Spring term:

<table>
<thead>
<tr>
<th>Credits</th>
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<tr>
<td>OR&amp;IE 523, Introduction to Stochastic Modeling</td>
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<tr>
<td>OR&amp;IE 894, Applied OR&amp;IE Colloquium</td>
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<tr>
<td>OR&amp;IE 599, Project</td>
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</table>

Two technical electives: 6

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 the 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.(ORIE) 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.
110 The Laser and Its Applications in Technology, Science, and Medicine (also A&EP 110) Fall, spring 3 credits. 2 lecs, 1 lab. T. A. Cook, A. Lewis. The principles of laser action, types of laser systems, elements of laser design, and applications of lasers in science, technology, and medicine are discussed. In the laboratory students build and operate a nitrogen laser and a tunable dye laser. Demonstration experiments with several types of lasers illustrate phenomena such as holography, laser-induced color, spectroscopy, frequency doubling, and interferometry. Guest lectures by prominent medical and industrial scientists introduced students to current fields of laser application and research.

112 Introduction to Chemical Engineering (also Chem E 112) Fall, spring 3 credits. 3 lecs. F. Rodriguez. This course is designed to acquaint students with the scope of chemical engineering. Topics such as polymers, fluid flow, and 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. C. A. Shoemaker, M. A. Turnquist. 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. J. F. Abel, A. R. Ingraffea. 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 computer 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&E 117) Fall. 3 credits. Consists of two half-semester 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. 2 lecs, 1 lab. Drawing and Engineering Design (see Engr 102) will enable students without prior mechanical drawing experience to understand and create basic engineering graphics. The other two minicourses provide an introduction to topics of current interest by featuring two brief introductions to mechanical engineering: energy conversion, and mechanical design and manufacturing.

119 Introduction to Manufacturing Engineering (also M&E 119 and OR&IE 119) Spring. 3 credits. 2 lecs, 1 lab. Engineering considerations in the design, manufacture, 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 a neutron from 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 MS&E 122) Fall. 3 credits. 2 lecs, 1 lab or rec. Composite materials 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. Prerequisites: Mathematics 191 or 193, Physics 112, and Chemistry 207. 2 lecs, 1 rec, lab, or field trip. D. L. Turcotte; J. M. Bird.

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. Laboratory experiments with a tensile tester, shear beam, 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. 3 credits. 3 lecs. 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, operational amplifiers, diodes and transistors, linear models, bias circuits, and frequency response of small-signal amplifiers.

211 Computers and Programming (also CS 211) Fall, spring, 3 credits. Prerequisites: CS 100 or equivalent programming experience. 2 lecs, 1 rec, 2 evening exams. Intermediate programming in a high-level language and introduction to computer science. Topics include program development, invariant relations, block structure, recursion, and introduction to data structures and analysis of algorithms. Pascal will be the principal programming language.

219 or 220 Mass and Energy Balances (also Chem E 219, 220) Fall, 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 the computer-aided assessment 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 two 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.
266 Engineering

222 Introduction to Scientific Computation (also CS 222) Spring. 3 credits. Prerequisites: CS 100 and Mathematics 112, 122, or 192.
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. J. R. Steedinger, J. A. Liggett.

250 Introductory Engineering Probability (also OR&E 250) 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 OR&E 261, Stochastic Processes I, or by OR&E 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.

251 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, damping capacity, hardness, fracture strength, creep resistance, or fatigue resistance. Flaw-tolerant design methods using fracture mechanics.

252 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. A. F. Kuczek.
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.

303 Introduction to Nuclear Science and Engineering I (also NS&E 303) Fall. 3 credits. Prerequisite: Physics 201, or Physics 268 or 213, or permission of instructor. 2 lecs. V. O. Kostroun.
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.
2 lecs. D. D. Clark.
For description see NS&E 304.

306 Introduction to Biophysics Fall. 3 credits. S-U grades optional. Prerequisite: permission of instructor.
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.

333 Mechanics of Particles and Solid Bodies Fall. 4 credits.
3 lecs., 1 rec. H. H. Fleischmann.
Newton's laws; coordinate transformations; generalized coordinates and momenta. Lagrangian and Hamiltonian formulations. Applications to oscillator, restrained motion, central forces, small vibrations of multiparticle systems, motion of a rigid body.
434 Continuum Physics Fall. 4 credits. Prerequisites: A&EP 333 and 356 or equivalent. 3lec. 1rec. R. Lovelace. Local conservation laws; stress, strain, and rate-of-strain tensors; equations of motion for elastic and viscous response; waves in solids and fluids; dislocations; ideal fluids, potential flow, Bernoulli's equation, vorticity and circulation, lift; viscous incompressible flow and the Navier-Stokes equations, Reynolds number, Poiseulle flow in a pipe, Stokes drag on a sphere; boundary layers, Blasius equations, flow instabilities, Rayleigh-Benard convection and the onset of chaotic flow. Introduction to turbulent flow.


490 Informal Study in Engineering Physics Credit to be arranged. Laboratory on theoretical work in any branch of engineering physics under the direction of a member of the staff. The study can take a number of forms; for example, design of laboratory apparatus; performance of laboratory measurements, or theoretical design or analysis.

[601 Photosynthesis (also Biological Sciences 445) Fall. 3 credits. Prerequisites: Chemistry 104 or 208, Mathematics 106 or 111, and Physics 102 or 208, or permission of instructor. Not offered 1985-86. Staff. A detailed study of the process by which plants use light in order to grow, emphasizing physical and biochemical aspects.]

606 Introduction to Plasma Physics (also EE 581) Fall. 4 credits. Prerequisites: A&EP 305 or 356 or equivalent. Open to fourth-year students with permission of instructor. 3lec. J. A. Nation. For description see EE 581.

607 Advanced Plasma Physics (also EE 582) Spring. 4 credits. Prerequisite: A&EP 608. 3lec. R. V. Loveless. Boltzmann and Vlasov equations; waves in hot plasmas; Landau damping, microinstabilities; drift waves, low-frequency stability, collisional effects; method of dressed test particles; high-frequency conductivity and fluctuations; neoclassical toroidal diffusion, high-powered beams.

608 Plasma Astrophysics (also Astronomy 660) Spring. 2 credits. R. V. Loveless. Selected topics discussed in detail. (a) the solar corona and the solar wind; (b) hydrodynamic and magnetohydrodynamic flows around compact objects in galactic nuclei; (c) global electrodynamics of double radio sources.

609 Low-Energy Nuclear Physics Fall. 4 credits. Prerequisite: an introductory course in modern physics, including quantum mechanics. 3lec. D. D. Clark. The nuclear interaction. Properties of ground and excited states of nuclei; models of nuclear structure; alpha, beta, gamma radioactivity, low-energy nuclear reactions—resonant and nonresonant scattering, absorption, and fission. At the level of Introduction to Nuclear Physics, by Enge.

[611 Vision (also Biological Sciences 395) Fall. 3 credits. Prerequisites: Chemistry 104 or 208, Mathematics 106 or 111, Physics 102 or 208, or permission of instructor. Not offered 1985-86. Staff. Study of the mechanisms of seeing; embracing biological, physical, and chemical approaches to the subject.]

812 Nuclear Reactor Theory I Fall. 4 credits. Prerequisites: a year of advanced calculus and some nuclear physics. 3lec. K. B. Cady. Physical theory of fission reactors. Fission and neutron interactions with matter; theory of neutron diffusion, slowing down and thermalization; calculations of criticality and neutron flux distribution in nuclear reactors. Reactor kinetics. At the level of Nuclear Reactor Theory, by Lamarche.

613 Nuclear Reactor Theory II Spring. 3 credits. A continuation of A&EP 612, intended primarily for students planning research in nuclear reactor physics and engineering. Prerequisite: A&EP 612. 3lec. K. B. Cady. The Boltzmann linear transport equation, its adjoint, and their approximate solutions are developed and applied to the heterogeneous neutron chain reactor.

[614 Special Topics in Biophysics Offered alternate years. Not offered 1985-86. W. W. Webb. Topics include (1) theoretical aspects of intense electron and ion beams, such as equilibria 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.]


616 Modern Physical Methods in Macromolecular Characterization Spring. 3 credits. Prerequisite: a course in quantum mechanics or permission of instructor. Intended for advanced undergraduates or graduate students. Offered alternate years. A. Lewis. Modern physical methods of macromolecular characterization, with emphasis on techniques such as subpicosecond and picosecond fluorescence and absorption spectroscopy, excited and ground-state dipole-moment measurement, tunable-laser thermal-lens spectroscopy, tunable-laser Raman and coherent anti-Stokes Raman spectroscopy of ground and excited molecular states, and the measurement of vibrational optical activity. The course should appeal to students who are interested either in the use of such physical techniques for characterizing materials or in the physics of macromolecules and macromolecular assemblies. Macromolecular systems used as examples are of biological interest or are physically interesting polymeric materials.

622 Electron Optics Spring. 3 credits. Offered alternate years. M. S. Isaacson. Basic electron optics with emphasis on the fundamental principles of the production and focusing of charged-particle beams. Special consideration is given to the optics appropriate for beam transport and probe forming systems and systems useful in materials characterization. Included are discussions of the calculation of trajectories in multicomponent, comprehensive treatments of optical aberrations, and practical considerations of electron optical design.

633 Nuclear Engineering Fall. 4 credits. Prerequisite: introductory course in nuclear engineering. K. B. Cady. The fundamentals of nuclear reactor engineering, reactor siting and safety, fluid flow and heat transfer, control, and radiation protection.

634 Nuclear Engineering Design Seminar Spring. 4 credits. Prerequisite: A&EP 633. K. B. Cady. A course design study of a selected nuclear system. Emphasis is on safety, siting, and radiation protection in the design of nuclear systems.

636 Seminar on Thermonuclear Fusion Reactors Fall. 3 credits. Prerequisite: basic course in plasma physics or nuclear reactor engineering, or permission of instructor. Offered alternate years. 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&EP 606, 607) or equivalent, or permission of instructor. D. A. Hammer. Topics include (1) theoretical aspects of intense electron and ion beams, such as equilibria 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. 4 credits. Prerequisite: some nuclear physics. Two 2 1/2-hour afternoon periods plus 1lec. 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 Measurement, by Knoll.

652 Advanced Nuclear and Reactor Laboratory Spring. 3 credits. Prerequisites: A&EP 651, and 609 or 612. Offered on independent study basis or, with sufficient demand, as a formal course. Two 2-hour afternoon periods. D. D. Clark. Laboratory experiments and experimental methods in nuclear physics and reactor physics. Ten experiments are available, some using the Zero Power Reactor critical facility.

661 Microcharacterization Fall. 3 credits. Prerequisites: Physics 112, 213, and 214, or an introductory course in modern physics. M. Isaacson. 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).
662 Microprocessing of Materials  
Spring. 3 credits.

Several field trips. R. A. Buhrman.

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 submicron conductors, nonlinear fluctuators, 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-rays beams, with particular emphasis on synchrotron radiation X-ray sources. Diffraction from two- and three-dimensional periodic lattices. Fourier representation of scattering centers and the effect of thermal vibrations. Diffraction from almost periodic structures, surface layers, gases, and amorphous materials. Survey of dynamical diffraction from perfect and perfect lattices. Several laboratory experiments will be conducted.

751, 752 Project  
751, fall; 752, spring. Credit to be arranged.

Informal study under the direction of a member of the University staff. Students are offered some research experience through work on a special problem related to their field of interest.

753 Special Topics Seminar in Applied Physics  
Fall, spring. 4 credits. Prerequisite: undergraduate physics. Required for candidates for the M.Eng. (Engineering Physics) degree and recommended for seniors in engineering physics. Special topics in applied science, with focus on areas of applied physics and engineering that are of current interest. Subjects chosen are researched in the library and presented in a seminar format by the students. Effort is made to integrate the subjects within selected areas of atomic, plasma, biological, and solid-state physics, as suggested by the students and coordinated by the instructor.

761 Kinetic Theory (also EE 681)  
Fall. 3 credits. Prerequisite: EE 407, Physics 561, or permission of instructor. Offered alternate years.

2 lecs. R. L. Liboff.

For description see EE 681.

[762 Physics of Solid Surfaces and Interfaces  
Fall. 3 credits. Lecture course primarily for graduate and qualified senior students. Prerequisites: Physics 454 and MS&E 361. Similar to MS&E 703. Not offered 1985-86.

T. N. Rhodin.

A critical presentation of current understanding of the physics and chemistry of surface and interface phenomena in semiconductors, conductors, and ionic solids. Application of quantum and statistical mechanics to a discussion of the microscopic behavior of electrons, atoms, ions, and molecules at phase boundaries in condensed matter. Emphasis on the electron structure, surface crystallography, and chemical reactivity of both ideal and practical solid surfaces. Theory and application of modern methods of electron spectroscopy in ultrahigh vacuum. Material drawn from the current research literature is presented at the level of The Nature of the Surface Chemical Bond, edited by Rhodin and Ent.]
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).


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 between 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. 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.

611 Remote Sensing Applications Spring. 3 credits. Prerequisite: permission of instructor. 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 Environment Evaluation Fall. 3 credits. Prerequisite: permission of instructor. Not offered 1985-86. 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 1985-86. 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 imageries. Arctic, tropic, arid, and humid climate regions. Project applications.

615 Digital Image Processing Fall. 3 credits. Prerequisites: 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 (sampling, quantization, geometric degradations), enhancement procedures (thresholding, histogram modification, edge enhancement, pseudocolor and false color), spatial and spectral pattern recognition, and classification (supervised and unsupervised, error analysis).

616 Digital Image Analysis Spring. 3 credits. Prerequisites: calculus (Mathematics 192), statistics (Engr 206 or Agricultural Economics 310) and computer programming (FORTRAN or Pascal), 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 image-processing hardware and software.

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. S-U grades only. 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 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.

Public and Environmental Systems Engineering

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 311 but emphasizing "mathematical techniques and engineering-design implications. Theory 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 521 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. Loutts. 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.

325 Social Implications of Technology Fall. 3 credits. Not open to freshmen. A social science elective for engineering students. Not offered 1985-86. W. R. Lynn. Examines selected issues pertaining to the development, implementation, and assessment of technology. Special emphasis is given to social, political, and economic aspects of current problems that have important technological components.

426 Seminar in Technology Assessment Spring. 3 credits. Open to graduate students and upperclass undergraduates. Not offered 1985-86. W. R. Lynn. An interdisciplinary seminar dealing with the social consequences of technological developments and means by which technology can be guided in socially beneficial directions.

424 Legal Process Spring. 3 credits. Limited to graduate students and upperclass undergraduates. Not offered 1985-86. W. R. Lynn. An introduction to the structure and operation of our legal system. Development of legal skills and the ability to do one's own basic legal research.

625 Environmental Law I (also Toxicology 625) Fall. 4 credits. Limited to graduate students and seniors; other undergraduates with permission of instructor. P. Clermont. 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.

626 Environmental Law II Spring. 3 credits. Limited to graduate students and seniors; other undergraduates with permission of instructor. Recommended: CEE 625 or equivalent. Not offered 1985-86. 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 625 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.

628 Environmental Systems Analysis Spring. 3 credits. Prerequisite: CEE 323 or an introductory optimization course. C. A. Shoemaker. Use of computer analysis in engineering design for solutions to public-sector environmental problems. Deterministic and stochastic applications to problems of water quality, energy production, and facility location. Emphasis on model development.

629 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.

721 Environmental and Water Resources Systems Analysis Design Project On demand. Variable credit. Prerequisite: permission of instructor. May extend over two semesters. Staff. Design or feasibility study of environmental or water resources systems, supervised 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.

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. W. H. Brutsaert. 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. 3 credits. Prerequisite: CEE 331. 2 rec, 1 lab, field trips. G. H. Jirka. 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 Spring. 2 credits. Intended for non-engineering majors. Prerequisite: permission of instructor. Not offered 1985-86. W. H. Brutsaert.

Introduction to hydrology as a description of the hydrologic cycle and the role of water in the natural environment. Includes precipitation, infiltration, evaporation, groundwater, surface runoff, floods, and droughts.

630 Advanced Fluid Mechanics Fall. 3 credits. Prerequisite: CEE 331. 3 lecs. Staff. Introduction to tensor analysis; conservation of mass, momentum, and energy. Rigorous treatment includes study of exact solutions of the Navier-Stokes equations. Asymptotic approximations at low and high Reynolds numbers. Similarity and modeling. Laminar diffusion of momentum, mass, and heat.


634 Engineering Micrometeorology Spring. 3 credits. Prerequisite: CEE 331. 3 lecs. W. H. Brutsaert. Physical processes in the lower atmospheric environment: turbulent transport in the atmospheric boundary layer, surface-air interaction, disturbed boundary layer, radiation. Applications include sensible and latent heat transfer from lakes, plant canopy flow and evapotranspiration, turbulent diffusion from chimneys and cooling towers, and related design issues.

635 Coastal Engineering I Spring. 3 credits. Prerequisite: CEE 331. 3 lecs. G. H. Jirka. 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.

636 Environmental Fluid Mechanics I Fall. 3 credits. Prerequisite: CEE 331. 3 lecs. G. H. Jirka. Introduction to mass and heat transport processes due to pollutant discharges into the environment. Turbulent diffusion equation and its solution for instantaneously and continuously released: Concept of longitudinal dispersion in shear flow. Applications to pollutant-transport prediction in lakes, rivers, estuaries, and coastal zones, as well as the atmosphere. Topics include precipitation, jet transport to reaction kinetics. Exchange processes for mass and heat at the air-water interface. Convective transport due to density currents. Jet mixing and the design of outfall structures.

637 Project—Hydraulics On demand. Variable credit. 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.

538 Hydraulics Seminar Spring. 1 credit. Open to undergraduates and graduates and required of graduate students majoring in hydraulics or hydraulic engineering. Staff. 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. 3 lecs. P. L.-F. Liu. Review of linear and nonlinear theories for ocean waves, applicability of different wave theories to engineering problems, waves, water hammer, tsunamis, behavior of submerged and floating bodies, harbor agitations, ship waves.

731 Environmental Fluid Mechanics II Spring. 3 credits. Prerequisite: CEE 636 or permission of instructor. Offered alternate years. Not offered 1985-86. 3 lecs. G. H. Jirka. Mechanics of discretely and continuously stratified fluids: internal waves, density currents, blocking, selective withdrawal, and internal jumps. Interfacial stability and mixing. Observed characteristics of turbulent fluid flow in environmental applications, including interaction with buoyancy. Integral techniques for self-similar fluids: jets, plumes, and mixing layers. Experimental approaches to environmental fluid problems.

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.

733 Environmental Planning and Operation of Energy Facilities Spring. 3 credits. Prerequisites: CEE 636 or equivalent, Not offered 1985-86. G. H. Jirka. Survey of analytical methodologies for predicting and controlling the environmental impacts of individual energy facilities or of energy systems, presented in a mixed lecture and seminar format. Estimation of construction and operating impacts; pollutant sources, models for pollutant dispersal, modeling the relationships of pollutant concentration and ecological, health, and socio-economic damages. Pollutant-abatement strategies and transient-release techniques. Models for regional energy-facility siting.

734 Experimental Methods in Hydraulics On demand. 3 credits. Prerequisite: CEE 331. G. H. Jirka. Methods used in planning and conducting laboratory and field experiments in hydraulics 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.

Civil and Environmental Engineering 271
Geotechnical Engineering


640 Foundation Engineering  Fall, 3 credits. Prerequisite: CEE 341. Laboratory measurement of soil properties, from introductory to advanced topics. Emphasis on stress analysis. Critical evaluation of laboratory methodology. Design applications of laboratory-test results.

641 Retaining Structures and Slopes  Spring, 3 credits. Prerequisite: CEE 341. 3 lecs, optional tutorial. Staff. Design of retaining structures and slopes. Design of retaining walls, cut and fill techniques. Special topics include stability of deep foundations. 3 lecs. L. H. Irwin.

642 Highway Engineering (also Ag En 491)  Spring, 3 credits. Prerequisite: junior standing in engineering, fluid mechanics, and soil mechanics. May be taken concurrently. 2 lecs, 1 lab. L. H. Irwin.

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. Not offered 1985-86. 3 lecs, 1 lab. L. H. Irwin.

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. I. Staff. Detailed study of physical properties of soil. Stress-strain relations, stress transfer, and permeability of natural soils.

741 Rock Engineering  Fall, 3 credits. Prerequisite: CEE 341 or permission of instructor. Staff. Investigation of rock geology and engineering classifications of intact rock, discontinuities, and rock masses. Laboratory and field evaluation of properties. Stress states and stress-strain behavior. Design of foundations on, and openings in, rock masses. Analysis of the stability of rock slopes.

742 Graduate Soil Mechanics Laboratory  Fall, 3 credits. Prerequisite: CEE 740. Laboratory measurement of soil properties, from introductory to advanced techniques. Emphasis on strength, compressibility, permeability tests. Critical evaluation of laboratory methodology. Design applications of laboratory-test results.

744 Advanced Foundation Engineering  Spring, 3 credits. Prerequisite: CEE 640. Not offered 1985-86. 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.

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. 3 lecs. Staff.


748 Tunnel Engineering  Spring, 2 credits. Prerequisites: CEE 641 and 741. Not offered 1985-86. 2 lecs. Staff. Principles of analysis and design for earth and rock tunnels. 3 lecs. Staff.

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. Prerequisite: CEE 351 or permission of instructor. Staff. Introduction to environmental quality control. Quality parameters, criteria, and standards for water and wastewater. Emphasis on water-quality control concepts, theory, and methods. Elementary analysis pertaining to the modeling of pollutant reactions in natural systems, and introduction to design of unit processes for water and wastewater treatment.

352 Water Supply Engineering  Fall, 3 credits. Prerequisite: CEE 351 or permission of instructor. 3 lecs. R. I. Dick. Analysis of contemporary threats to human health by public water-supply systems. Criteria and standards for the quality of available water. Water-quality control theory. Design of facilities for obtaining, treating, storing, and distributing water.

651 Microbiology of Water and Wastewater  Fall, 2 credits. Prerequisite: one semester of college chemistry. Staff. Microbiological phenomena pertinent to analysis of natural systems and design of engineered microbial processes in pollution control.

652 Assimilation of Pollutants in Natural Systems  Fall, 3 credits. Prerequisite: CEE 351 or permission of instructor. 3 lecs. J. J. Bisogni. Assimilation and transport of pollutants in nature. Emphasis on the physics, chemistry, and biology that form the basis for mathematical description of the assimilation phenomenon in natural systems.

653 Chemistry of Water and Wastewater  Fall, 3 credits. Prerequisite: one semester of college chemistry or permission of instructor. 3 lecs. 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, and electrochemistry. The focus of the course is on the mathematical description of chemical reactions relevant to engineered processes and the natural system, and the numerical or graphical solution of these problems.

654 Aquatic Chemistry  Spring, 3 credits. Prerequisite: CEE 653 or Chemistry 267-288. 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.

656 Environmental Quality Management  Fall, Spring on demand. 3 credits (4 with approval of instructor). For upperclass or graduate students. May not be offered 1985-86. 2 lecs. Staff.

659 Environmental Quality Engineering Seminar Spring, 1 credit. Intended 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: CEE 653 (or concurrent enrollment) 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: CEE 651 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 or 755, or permission of instructor. 3 lecs., 1 lab. Staff. 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 process. 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. M. A. Turnquist. 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 Urban Transportation Planning Fall. 3 credits. A. J. Richardson. The problem of urban transportation; its roots, manifestations, and implications; the systems-analysis approach to transportation; supply and demand in the design and implementation of transportation systems; modeling components in the process of planning urban transportation; generation and evaluation of alternatives; modern practice of urban-transportation planning.

[661] Travel Demand Theory and Applications Spring. 3 credits. Prerequisite: CEE 660 or permission of instructor. Not offered 1985-86. New methods for estimating and predicting travel demand. Treatment of the individual as an economic and psychological decision-making unit. Theoretical background of the models, empirical estimation, measurement of attributes, and need for appropriately designed transportation facilities and operations. Practical problems and directions of present and future research. Issues of survey-sample design.

663 Transportation Systems Analysis Fall. 3 credits. Prerequisites: CEE 323, ORIE 520, or permission of instructor. A. J. Richardson. Application of operations-research and systems-analysis techniques to transportation systems, both passenger and freight. Network flows. Design of networks, routes, and schedules. Terminal operation and design.


668 Operations, Design, and Planning of Public Transportation Systems Fall. 3 credits. Recommended: CEE 361 or 660, or permission of instructor. G. P. Fisher. Financing and organization of mass transportation. Design of route networks. Scheduling of services. Use of computer-aided design methods. Fare policy and planning for provision of integrated services. The role of innovative technology.


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.

[674] Special Topics in Transportation Fall, spring. Variable credit. Staff. Consideration of subject matter not covered in depth in regular courses. Topics vary from year to year but may include such topics as terminal operations, airport planning and design, traffic-flow theory, marine transportation.

Structural Engineering

371 Structural Behavior Fall. 4 credits. Prerequisite: Engr 202. 3 lecs., one 2-hour lab, evening exams. R. N. White. Fundamental concepts of structural engineering. Behavior, analysis, design, structural planning. Loads, structural form, statically determinate analysis, approximate analysis of indeterminate systems. Fundamentals of behavior and design of steel and concrete members.


373 Design of Concrete Structures Fall. 4 credits. Prerequisites: CEE 372 or permission of instructor. Prerequisites or corequisites: CEE 376 and Engr 261. Evening exams, design project. A. H. Nilson. Behavior and design of reinforced concrete, prestressed concrete, and composite structures.

374 Design of Steel Structures Spring. 4 credits. Prerequisite: CEE 373 or permission of instructor. Prerequisites or corequisites: CEE 376 and Engr 261. Evening exams, design project. T. Pekoz. Behavior and design of steel structures. Introduction to the plastic analysis of frames.

375 Structural Behavior Laboratory Spring. 2 credits. Prerequisite or corequisite: CEE 372. Not offered 1985-86. R. N. White. 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. F. O. Saito. 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.


673 Advanced Structural Analysis Fall. 3 credits. Prerequisites: CEE 372 and computer programming. 3 lecs., one 2-hour lab. A. J. Richardson. Advanced structural analysis methods in matrix formulation, use of standard analysis programs, error detection, substructuring, and special analysis procedures.
674 Structural Model Analysis and Experimental Methods Fall, 3 credits.
2 lecs, 1 lab. R. N. White.
Dimensional analysis and similitude. Model materials, fabrication, loading, instrumentation techniques, and use of design. Experimental stress analysis.

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 Fall. 3 credits.
2 lecs, conferences. F. O. Slate.
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.

770 Engineering Fracture Mechanics Fall. 3 credits. Prerequisite: CEE 772 or permission of instructor. Offered alternate years. Not offered 1985-86.
2 lecs, 1 lab. A. R. Ingraffea.

771 Structural Stability: Theory and Design Spring. 3 credits.
T. Pekoz.

772 Finite-Element Analysis Spring. 3 credits. Prerequisites: CEE 672 and 673, or permission of instructor.
A. R. Ingraffea.

773 Structural Reliability Spring. 3 credits. Not offered 1985-86.
M. D. Grigorou.
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. Ref. 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: CEE 373.
T. Pekoz.
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.
Staff.
Behavior and design of tail-building systems. Plate girders. Cold-formed steel.

[778 Shell Theory and Design Spring. 3 credits. Offered alternate years. Not offered 1985-86.
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.
2 lecs, 1 lab. K. C. Hover.
Advanced study of the chemistry, physics, and microstructure of concrete. Investigation of cement manufacture and chemistry, hydration reactions and thermodynamics, effect of admixtures. Study of microstructure with scanning electron microscope, gas adsorption, and porosimetry. Engineering properties and behavior include failure mechanisms and elastic and viscoelastic behavior.

[781 Numerical Methods in Structural Engineering Fall. 3 credits. Prerequisites: CEE 672 and 673. Offered alternate years. Not offered 1985-86.
J. F. Abel.
Numerical techniques for structural and geotechnical engineering, such as residual, variational, finite-difference, and finite-element methods. Selected numerical analysis topics and solution algorithms with emphasis on linear equations and eigenvalue problems.]

782 Advanced Topics in Finite-Element Analysis Fall. 3 credits. Prerequisite: CEE 772. Offered alternate years.
J. F. Abel, A. R. Ingraffea.
Lectures and discussions on selected advanced topics and research in progress, including dynamics, nonlinear analysis, shells, fracture mechanics, fluid dynamics, and computer graphics.

Individual projects or reading and study assignments involving environmental 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 or independent design or research. Only for work on 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.

Water-Resources Planning and Analysis

691 Water-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.
Historical and contemporary perspectives on water problems. Organization and public policies.

692 Stochastic Hydrologic Modeling On demand. 2-3 credits. Prerequisite: OR&IE 370 or CEE 304.
J. R. Stedinger.
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.

693 Water-Quality Modeling Fall. 1-3 credits. Prerequisite: CEE 323 or equivalent.
D. P. Loucks, C. A. Shoemaker.
Development and systematic application of predictive models for estimating the concentrations of chemical and biological constituents in bodies of surface water and groundwater. Application of existing computer-simulation and optimization models to regional water-quality management problems.

694 Water-Resources Systems I Fall. 3 credits.
Prerequisite: CEE 323 or equivalent.
D. P. Loucks.
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 planning and operation, hydropower-capacity development, flow augmentation, flood control and protection, and water-quality models.

695 Water-Resources Systems II Spring. 3 credits.
Prerequisites: CEE 304 and 694 or permission of instructor.
J. R. Stedinger, D. P. Loucks.
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 692.
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 must take 101 or 102 first.
2 lecs, 1 rec (optional), 3 evening exams. For description see Engineering Common Courses.

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 history of computation; microtechnology; the retrieval and transmission of information; scientific computing; computer graphics, art, and music; robotics, natural-language processing, and machine intelligence. Students become acquainted with the notion of an algorithm by writing several Pascal programs using the Cornell Program Synthesizer. The amount of programming is about half of that taught in CS 100. Each student writes a term paper on some aspect of computing. The aims of the course are to make the student an intelligent consumer of what the computer has to offer and to develop an appreciation of algorithmic thinking.

102 Introduction to Microcomputer Applications (also Ag En 102) Fall. 3 credits. Not open to engineering students.
2 lecs, 1 rec, 2 evening exams. An introduction to the nonprogramming use of modern microcomputers as tools for solving problems. The course will attempt to assess and demonstrate the capabilities and limitations of the current generation of personal computers through software for word processing, spreadsheets, databases, and other applications. There is no prerequisite except interest, and very little programming with high-level language will be involved.

211 Computers and Programming (also Engr 211) Fall, spring, summer. 3 credits. Prerequisite: CS 100 or equivalent programming experience.
2 lecs, 1 rec, 2 evening exams. For description see Engineering Common Courses.

222 Introduction to Scientific Computation (also Engr 222) Spring. 3 credits. Prerequisites: CS 100 and Mathematics 112, 122, or 192.
2 lecs, 3 evening exams. For description see Engineering Common Courses.

280 Discrete Structures Fall, spring. 4 credits. Prerequisite: CS 211 or permission of instructor.
3 lecs. Covers mathematical aspects of programming and computing. Topics will be chosen from the following: mathematical logic, proof, boolean algebra, predicate calculus; combinatorics and discrete mathematics covering manipulation of sums, recurrence relations, and generating-function techniques; recursive functions, relations, partially ordered sets.

305 Social Issues in Computing Fall. 3 credits. Prerequisite: CS 100 or 101, or permission of instructor.
2 lecs.
Economic, political, legal, and cultural impact 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 privacy; machine creativity and machine intelligence.

310 Data Structures Fall, summer. 4 credits. Prerequisite: CS 280 or permission of instructor.
3 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 1985; spring, summer thereafter. 4 credits. Prerequisite: CS 211 or equivalent.
2 lecs, 1 rec, 2 evening exams.
Introduction to the logical structure of digital computers. Topics include representation of information, machine-assembly language, the 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.
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.

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 in Lisp; the machine is used for the project and for a variety of small assignments in programming and proving.

412 Introduction to Computers 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 computer 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 computer 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) Fall 1985; spring thereafter. 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. Not offered 1985-86.
3 lecs.
Modern algorithms for systems of linear and nonlinear equations and multidimensional optimization. Emphasis is on stable and efficient methods. Students will analyze such methods with the aid of linear algebra and multivariable calculus and gain experience with state-of-the-art software packages. Students with prior exposure to the numerical solution of differential equations are advised to take Mathematics 425, a natural spring-term sequel to CS 421.

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 lec.
Issues related to the design and implementation of database-management systems will be addressed. Students will implement a simplified relational database system using a file-access method and query-processing algorithms.

484 Introduction to Symbolic Computation Spring. 4 credits. Prerequisites: CS 361, Mathematics 332 or 432, or permission of instructor. Not offered every year.
2 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.

490 Independent Reading and Research Fall, Spring. 1-4 credits. Independent reading and research for undergraduates.

600 Computer Science and Programming Fall. 4 credits. Prerequisite: CS 210 or permission of instructor. 1 lab. Introduction to practical, modern ideas in programming methodology. Covers style and organization of programs, basic techniques for presenting proofs of correctness of programs, and the use of a "calculemus" for the derivation of programs.

611 Advanced Programming Languages Fall. 4 credits. Prerequisite: CS 210 or permission of instructor. 3 lecs. 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, including logic programming, functional programming, and data-flow languages.

612 Translator Writing Spring. 4 credits. Prerequisite: CS 210 and 212, or permission of instructor. 3 lecs. 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 for bootstrapping methods, and translator writing systems.

613 Concurrent Programming and Operating Systems Principles Spring. 4 credits. Prerequisite: CS 414 and 600, or permission of instructor. 3 lecs. 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. 2 lecs. 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.

616 VLSI Algorithms Spring. 4 credits. Prerequisite: permission of instructor. 2 lecs. This course focuses on the area-time performance of VLSI computing systems. After a review of technology, a model for 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 210 and Mathematics 411 and 431, or permission of instructor. 3 lecs. Numerical matrix algorithms Stable and efficient methods for solving systems of linear equations: Gaussian elimination, Cholesky decomposition, bounded and structured systems, the QR factorization, and fast eigenvalue methods. The symmetric and unsymmetric eigenvalue problems and related computational problems. The singular value decomposition.

622 Numerical Optimization and Nonlinear Algebraic Equations Spring. 4 credits. 3 lecs. 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, quadratic programming, and numerical approximation.

632 Database Systems Fall. 4 credits. Prerequisites: CS 210 and 342, or permission of instructor. 2 lecs. 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 Information Organization and Retrieval Spring. 4 credits. Prerequisite: CS 310 or permission of instructor. 2 lecs. 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. 2 lecs. 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. 2 lecs. 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 555) Fall. 4 credits. Prerequisite: Mathematics 431 and 432, or the equivalent in both content and level of mathematical sophistication, or permission of the instructor. 3 lecs. This course will have two parts, one purely mathematical and the other emphasizing applications. The first part 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 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. 3 lecs. 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. 1 lab. Introduction to the use of equipment and techniques in a modern robotics laboratory. Includes VAL programming, force sensing, compliant motion, and mechanical assembly.

681 Analysis of Algorithms Fall. 4 credits. Prerequisite: CS 381 or permission of instructor. 3 lecs. Major paradigms used in the creation and analysis of algorithms. Complexity measures, advanced data structures, algorithms on graphs, lower bounds, reducibilities, and polynomial complete problems. Special topics in analysis of algorithms. This course includes the contents of CS 382.

682 Theory of Computing Spring. 4 credits. Prerequisite: CS 381 or permission of instructor. 3 lecs. 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. 2 lecs. 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. 2 lecs. Topics are chosen at instructor's discretion.

713 Seminar in Operating Systems Fall, Spring. 4 credits. Prerequisite: CS 613 or permission of instructor. Discussion of contemporary issues in operating systems.
714 Distributed Computing Spring. 4 credits. Prerequisites: CS 414 and an advanced systems course such as CS 613, 614, 632, or 643. 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 include optimal resource placement, cache management, the specification of distributed programs, and randomized protocols.

715 Seminar in Programming Refined Logics Fall, spring. 4 credits. Prerequisite: permission of instructor. Topics in programming logics, possibly including type theory, constructive logic, decision procedures, heuristic methods, extraction of code from proofs, and the design of proof-development systems.

719 Seminar in Programming Fall, spring. 4 credits. Prerequisite: CS 611 or permission of instructor. S-U grades only.

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 1985-86. 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 1985-86.

739 Seminar in Information Organization and Retrieval Fall, spring. Credit to be arranged. Prerequisite: CS 635 or permission of instructor. S-U grades only.

747 Seminar in Semantics Spring. 1 credit. Prerequisite: 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

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. Circuit elements and laws, analysis techniques, operational amplifiers. Response of linear systems, with an introduction to complex frequency and phases, 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.

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 (LTI) systems and complex exponential signals, steady-state analysis of active and passive circuits, impulse response, natural modes, convolution, Laplace Transform and general LTI system response, state-space analysis of LTI systems.

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 Electromagnetic Waves and Fields I Fall. 4 credits. Prerequisites: grades of C or better in Physics 213 and 214, and Mathematics 294. 3 lecs, 1 rec-computing session. Foundation of electromagnetic theory. Topics include Maxwell's equations, boundary conditions, electrostatics, Poynting theorem, plane waves in isotropic media, impedance concept and reflections, transmission lines, rectangular waveguides, radiation, and simple antennas.

304 Electromagnetic Waves and Fields II Spring. 4 credits. Prerequisites: EE 301 and 303. 3 lecs, 1 rec-computing session. Applications of electromagnetic theory, with emphasis on wave propagation and guidance, radiating systems, and the effects of the medium on transmission. Topics include confinement of static and dynamic fields in regions bounded by conductors (such as cavities and waveguides), separation of variables, losses, retarded potentials, relation of radiation fields to source distributions, antenna gain concepts, and techniques in antenna design; propagation in inhomogeneous and anisotropic media, complex permittivity, plasma and magnetic field effects, including frequency dependence.

306 Fundamentals of Quantum and Solid-State Electronics Spring. 4 credits. Prerequisites: Physics 214, Mathematics 294, and EE 303. 3 lecs, 1 rec-computing session. Introductory 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 Schrödinger's equation. Topics 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. Applications 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 Spring. 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.


[421 Bioinstrumentation Spring. 3 credits (4 credits with lab). Prerequisites: EE 301 and 316. Not offered 1985-86. 2 lecs, 1 lab. The acquisition and processing of biological signals. Topics include electrodes, ion-selective electrodes, temperature transducers, pressure transducers, flow transducers, force transducers, displacement transducers, operational amplifiers, instrumentation amplifiers, analog signal processing, D/A and A/D conversion, and digital processing with minicomputers and microprocessors.]
278 Engineering

423 Introduction to Analog and Digital Signal Processing Fall. 3 credits (4 with lab). Prerequisite: EE 301. 3 lecs; 1 lab. Design of passive filters and matching networks. Design of active filters using operational amplifiers. Digital-signal processing. 2-transform and discrete Fourier transform (DFT). Design of nonrecursive and recursive digital filters. Fast Fourier transform (FFT) algorithms.

424 Computer Methods in Electrical Engineering Fall. 4 credits. Prerequisite: EE 301. 3 lecs; C. Pottle. Numerical techniques every electrical engineer should know, with applications 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.

426 Digital Signal Processing Spring. 3 credits (4 with lab). Prerequisites: EE 302 and 423, or permission of instructor. 3 lecs; 1 lab. Topics include FIR and IIR filter design; the DFT, FFT, and CFFT; spectral analysis; data compression; adaptive filters; and speech synthesis. Laboratory involves design of filters using minicomputer-based design tools and implementation of real-time digital filters with microphone-based filter systems. At the level of Theory and Application of Digital Signal Processing, by Rabiner and Gold.


428 Analog and Discrete-Time Circuit Applications Spring. 4 credits. Prerequisite: EE 423, 427, or equivalent. 3 lecs. Synthesis of analog transducers. Analog and digital transfer functions: maximally flat, Chbyshhev, ellliptic. Gain-bandwidth theory. Transmission-line properties with applications to microwave circuit design and relation to digital filters.

430 Introduction to Lasers and Optical Electronics Spring. 3 or 4 credits. Prerequisite: EE 306 or equivalent (such as Physics 443). 3 lecs, 1 optional lab. An introduction to stimulated emission devices such as masers, lasers, and optical devices based on linear and nonlinear responses to coherent fields. Material discussed, based on quantum mechanics and classical electrodymanics, stresses applications to modern devices. Discussions of applications include the operating principles of a variety of important lasers, propagation characteristics of laser beams, optical modulators, and an introduction to integrated and fiber optics. Labs present an opportunity to work with a variety of the lasers and processes discussed in lectures.

431-432 Electronic Circuit Design 431, fall; 432, spring. Credits each term. Prerequisites: EE 230, 301, and 316. 3 lecs; 1 lab. N. C. MacDonald, S. W. Wong. The lectures develop circuit-design concepts for analog and digital circuits, with emphasis on the 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 and application of common analog and digital integrated circuits such as high-frequency amplifiers, operational amplifiers, TTL and MOS logic, and semiconductor memory. At the level of Analysis and Design of Analog Integrated Circuits, by Hodges and Jackson, and Analysis and Design of Analog Integrated Circuits, by Gray and Meyer.

435-436 Semiconductor Electronics I and II 435, fall; 436, spring. 4 credits each term. Prerequisites: EE 306 and 316. 3 lecs; 1 lab; J. P. Krusius. Semiconductor electronics from point-contact transistor to one-megabit random-access memory. Fall term: basic physics of semiconductor materials, electron and hole transport, optical properties, interfaces, junction diodes, bipolar transistors, junction field-effect transistors, and MOS transistors. Spring term: compound semiconductor field-effect devices; integrated semiconductor circuits, MOS circuits, bipolar circuits, compound semiconductor circuits, regenerative semiconductor circuits, semiconductor memories and building blocks for VLSI, integrated-circuit testing, computer modeling of devices.

442 Fundamentals of Acoustics (also T&AM 666) Spring. 3 credits. 3 lecs; biweekly lab. For description see T&AM 666.

451-452 Electric Energy Systems I and II 451, fall; 452, spring. 4 credits each term. Prerequisite for 451: EE 316 or permission of instructor. 3 lecs; 1 lab-computing session. Engineering principles underlying operation of modern electric-power systems under steady-state and transient conditions emphasizing major power-system parameters. Power System Laboratory's digital computer is used as a dynamic "laboratory" model of complex power systems for load-flow, fault, stability, and economic-dispatch studies. At the level of Elements of Power System Analysis (4th ed.), by Stevenson.

475 Computer Structures Fall. 4 credits. Prerequisite: EE 423, 427, or equivalent. 3 lecs; 1 lab; N. M. Vrana. Organization and design of digital computers. Hard-wire and microprogrammed control sequencers, arithmetic hardware, and I/O systems. Each four-to-six-person laboratory group will design and construct a small digital computer.

476 Microprocessor Systems Spring. 4 credits. Prerequisite: EE 423, 427, or equivalent. 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.


484 Introduction to Controlled Fusion: Principles and Technology (also M&AE 559 and NS&E 484) Spring. 3 credits (4 with lab). Prerequisites: EE 301 and 303, or permission of instructor. Intended for seniors and graduate students. 3 lecs; P. L. Auer. For description see NS&E 484.

499-492 Senior Project 491, fall; 492, spring. 3 credits. Individual study, analysis, and, usually, experimental tests in connection with a special engineering project chosen by the student after consultation with the faculty member directing the project. An engineering report on the project is required.

521 Theory of Linear Systems Fall. 4 credits. Prerequisite: EE 302 or permission of instructor. 3 lecs. State-space and input-output linear systems. Transition matrices, 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).

530 Integrated and Fiber Optics Fall. 3 credits. Prerequisites: EE 303 and 306 or equivalent. 3 lecs. A detailed treatment of the physical principles of fiber optics, integrated optics, and their applications to communication and sensing. Topics include propagation of EM waves through lossy fibers, dispersion and bandwidth considerations, light sources based on semiconductor lasers or LEDs, detectors and noise, modulation techniques, nonlinear effects in fibers, thin-film waveguides and integrated optical devices, and fiber sensors.

531 Quantum Electronics I Fall. 4 credits. Prerequisites: EE 306 and 407 or Physics 443. 3 lecs; 1 rec-computing session. A detailed treatment of the physical principles underlying lasers and masers, related fields; and applications. Topics include a review of quantum mechanics and the quantum theory of angular momentum; the interaction of radiation and matter, including emission, absorption, scattering, and macroscopic material properties; theory of the laser, including methods of achieving total and partial population inversion; optical resonators; output power of amplifiers and oscillators; dispersive effects and laser oscillation spectrum.

532 Quantum Electronics II Spring. 4 credits. Prerequisite: EE 531 or permission of instructor. 3 lecs; 1 rec-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.

533 Solid-State Microwave Devices and Circuits Fall. 3 credits. Prerequisite: EE 304. 2 lecs; 1 lab. Theoretical and experimental studies of circuits, amplifiers, oscillators, detectors, receivers, and electrical noise at microwave frequencies. Typical topics: one- and two-port resonators; negative-resistance amplifiers; oscillator load characteristics,
locking and stabilization; microwave amplifiers; intermodulation effects; resistor and shot noise; noise figure. FM noise. Laboratory makes use of the H-P 8510A Automatic Network Analyzer and other microwave equipment.

534 Solid-State Microwave Devices and Circuits II Spring. 3 credits. Prerequisite: EE 533. 2 lecs. 1 lab. Basic theories of solid-state devices at microwave frequencies. Specific devices studied: varactors, IMPATT diodes, transferred electron (Gunn) diodes; p-n-p oscillator diodes; tunnel diodes; pin diodes; detectors and microwave transistors. Studies of experimental methods of characterizing these devices include use of the H-P 8510A Automatic Network Analyzer and other microwave equipment.

536 VLSI Technology Spring. 4 credits. Prerequisite: EE 476 or permission of instructor. 3 lecs. Processing technology for silicon MOS and bipolar integrated circuits, especially VLSI. Lithography, crystal growth, diffusion, ion implantation, oximation, chemical-vapor deposition, etching, sputtering, epitaxy, polishing, process integration, and process simulations. At the level of VLSI Technology, edited by S. M. Sze.

541 Computer Processor Organization and Memory Hierarchy Fall. 4 credits. Prerequisite: EE 476 or permission of instructor. 3 lecs. 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, interlevel 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. 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 specific classes of problems? The architectures we will examine include systolic arrays, mesh-connected processors, and data-flow combinational networks. 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. Torng. Methods and approaches in the design, analysis, and implementation of local and wide area networks; circuit switching, packet switching, carrier-sense multiple access with collision detection, token passing, ethernet, buses, and rings, roles and functions of protocols, laying out 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. Torng. Analysis and implementation of time- and space-division switching; architectural alternatives for telecommunication systems; blocking and nonblocking networks; 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 475 and permission of instructor. 3 lecs. 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 two 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. Prerequisites: EE 302, 423, and 475, or permission of instructors. Not offered 1985-86. 3 lecs. Image formation and perception, computer representation of images, image enhancement and restoration, image reconstruction from projections, scale-space analysis, image analysis, and computer architecture for image processing. The programming of several computer vision algorithms will be required.

555 Advanced Power Systems Analysis I Fall. 3 credits. Prerequisites: EE 302 and concurrent registration in 451, or permission of instructor. Not offered 1985-86. 3 lecs. 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 equipment. Emphasis on derivation of mathematical models from first principles; development of algorithms for the formation of applicable network matrices.


561 Error-Correcting Codes Fall. 3 credits. Prerequisite: linear algebra. Not offered 1985-86. A detailed study of error-correcting linear block codes. Hamming codes, minimum distance, standard array, minimum distance decoding, cyclic codes. New codes from old and the dual code. The Hamming spheres packing and the Singleton bound for error-correcting codes. Algebraic groups, rings, and fields with special emphasis on Galois or finite-field theory. The construction and decoding of BCH and Reed-Solomon (RS) codes. Burst error-correcting and concatenated codes.

562 Fundamental Information Theory Spring. 3 credits. Prerequisite: EE 310 or equivalent. 1 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 distance bounds. Information, coding, and public-key cryptography. Examples drawn from packet-switched transmission of data over local and wide-area communication networks: TDMA, FDM, 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 Fall. 4 credits. Prerequisite: EE 310 or equivalent. Utility theory and Bayes, minimax, and Neyman-Pearson decision theories. Bayes and maximum likelihood estimation. Cramer-Rao bound, Fisher information, efficient and consistent estimates. Applications drawn from the areas of pattern classification, detection, and communications.

567 Communication Systems I Fall. 4 credits. Prerequisite: EE 310 or equivalent. 2 lecs, 1 rec. Analog and digital signal representation, spectral analysis, linear-signal processing, modulation and demodulation systems. Time- and frequency-division multiplexing; analog and digital signals and noise in analog and digital systems.

568 Communication Systems II Spring. 4 credits. Prerequisite: EE 567 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), maximum-a-posteriori (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.

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 and 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- and nonlinear-control systems, and computer-aided design techniques. Laboratory emphasis is on correlation of theoretical and experimental results.
572 Digital Control Systems

Spring. 4 credits. Prerequisite: EE 571 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. Not offered 1985-86.

580 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 state; 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.

581 Advanced Plasma Physics (also A&E 607)

Spring. 4 credits. Prerequisite: EE 581. 3 lecs. R. V. Lovelace. For description see A&E 607.

585 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, polarizability, radiation, Liénard-Weichert potentials, radiation from accelerated charges, Cerenkov radiation. Electrodynamics of dispersive dielectric and magnetic media. At the level of Classical Electrodynamics by Jackson.

586 Microwave Theory

Spring. 4 credits. Prerequisite: EE 304 or equivalent. 3 lecs. 1 rec. P. McIaac.

588-589 Graduate Topics in Electrical Engineering 1-3 credits.

Seminar, reading course, or other special arrangement agreed upon between the students and faculty members concerned.

589 Magneto-hydrodynamics

Spring 3 credits. Prerequisite: EE 581. Offered alternate years. Not offered 1985-86. 3 lecs. 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.

591-599 Materials and Device Physics for VLSI 3 credits.

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, static delay, cell layout, regular control structures, simulation, performance analysis, RC timing model, system design for performance, design for testing, semicustom 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 revised during the spring semester.

593 Solid-State Devices I

Fall. 4 credits. Prerequisite: EE 436 or equivalent. Not offered 1985-86.

594 Magnetics

Fall. 3 credits. Prerequisite: EE 573 or equivalent. Not offered 1985-86.

595 Magnetics

Spring. 3 credits. Prerequisite: EE 573 or equivalent. Not offered 1985-86.

596 Magnetics

Fall. 4 credits. Prerequisite: EE 573 or equivalent. Not offered 1985-86.

597 Electromagnetic Wave Propagation I

Fall. 3 credits. Prerequisite: EE 304 or equivalent. Not offered 1985-86. 3 lecs. Some aspects of antenna theory; 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; the CMA diagram; WKW solutions of the coupled wave equations.

598 Electromagnetic Wave Propagation II

3 credits. Prerequisite: EE 587. Not offered 1985-86. 3 lecs. Full-wave solutions of the wave equations; interactions between particles and waves; scattering of radio waves from random fluctuations in refractive index; scattering of coherent scatter from the ionosphere and its use as a diagnostic tool; scattering from unstable plasma waves; pulse compression and other radar probing techniques; radio-interferometer satellite scintillations and their use as diagnostic tools.

599 Magnetohydrodynamics

Spring 3 credits. Prerequisite: EE 581. Offered alternate years. Not offered 1985-86. 3 lecs. 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.

600 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 state; 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.

607 Advanced Plasma Physics (also A&E 607)

Spring. 4 credits. Prerequisite: EE 581. 3 lecs. R. V. Lovelace. For description see A&E 607.

608 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, polarizability, radiation, Liénard-Weichert potentials, radiation from accelerated charges, Cerenkov radiation. Electrodynamics of dispersive dielectric and magnetic media. At the level of Classical Electrodynamics by Jackson.

635 Solid-State Devices I

Fall. 4 credits. Prerequisite: EE 436 or equivalent. Not offered 1985-86.

636 Solid-State Devices II

Spring. 4 credits. Prerequisite: EE 635 or equivalent. Not offered 1985-86.

638 Materials and Device Physics for VLSI 3 credits.

Prerequisite: EE 436 or equivalent. Not offered 1985-86.

Materials and device problems to be considered in the design and fabrication of VLSI circuits. High-field electron and hole transport; nonequilibrated electron transport; impact ionization; solutions of Boltzmann's equation using Monte Carlo techniques, role of velocity overshoot in short-channel devices; comparison of elemental and compound semiconductors; homojunction and heterojunction devices. Submicron-scale phenomena in MOSFETs and bipolar devices; implications for circuit design.

639 VLSI Design System 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, static delay, cell layout, regular control structures, simulation, performance analysis, RC timing model, system design for performance, design for testing, semicustom 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 revised during the spring semester.

661-662 Random Processes in Electrical Systems 661, fall; 662, spring. 4 credits each term. Prerequisites: EE 302 and 310. Not offered 1985-86. 3 lecs.

Advanced Topics in Information Theory Fall. 4 credits. Prerequisites: EE 562 and either EE 681, Mathematics 571, or permission of instructor. Not offered 1985-86.

3 lecs.

An in-depth treatment of an information-theory research area. The topic varies from year to year and is chosen from the following subjects: source encoding (rate-distortion theory), decentralized systems, multiterminal communication networks, ergodic theory, computability and instrumentality of coding schemes, coding for computer memory.

Foundations of Inference and Decision Making Spring. 3 credits. Prerequisite: A course in probability and some statistics, or permission of instructor. Not offered 1985-86.

An examination of methods for characterizing uncertainty and chance phenomena and for transforming information into decisions and optimal systems. The topics include Bayesian learning, inductive inference, and possible applications to learning and reasoning from partially specified probability distributions. The emphasis is on principles and techniques rather than on specific applications.

Random Processes in Control Systems Spring. 4 credits. Prerequisite: EE 574. Not offered 1985-86.

Prediction and filtering in control systems: Gaussian-Markov process, prediction problem, stochastic optimal and adaptive control problems. Control of systems with uncertain statistical parameters; stochastic differential equations, optional nonlinear filtering; stability of control systems with random parameters.

Adaptive Parameter Estimation Spring. 3 credits. Prerequisites: EE 426 and 572, or permission of instructor. Not offered 1985-86.

Discrete techniques of recursive parameter estimation. The course focuses on equation- and output-error formulations for parameter estimation in autoregressive, moving-average processes. Stability theory applicable to such nonlinear, time-varying systems is developed and used to analyze the convergence of various algorithms, including gradient-descent search, recursive least-squares, and recursive maximum-likelihood. These algorithms are applied to problems in adaptive filtering, identification, and control.

Kinetic Theory (also AEEP 761) Spring. 3 credits. Prerequisites: EE 407 or Physics 561, or permission of instructor. Offered alternate years. Not offered 1985-86.

3 lecs, R. L. Liboff.


Nonlinear Phenomena in Plasma Physics Spring. 3 credits. Prerequisite: EE 582. Not offered 1985-86.


Electrical Engineering Colloquium 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 current topics in the field. Report required.

Electrical Engineering Design 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.

Graduate Topics in Electrical Engineering 1-3 credits. Seminar, reading course, or other special arrangement agreed upon between the students and faculty members concerned.

Thesis Research 791, fall; 792, spring. 1-15 credits. For students enrolled in the master's or doctoral program.

101 Introductory Geological Sciences Fall, spring. 3 credits.

2 lecs, 1 lab, field trips, evening exams in the fall term, Fall, W. B. Travers; spring, A. L. Bloom. 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.

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 resources, and mineral resources.

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.

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. L. Turcotte, J. M. Bird.

For description see Engineering Common Courses.

Introduction to Field Methods in Geological Sciences Fall. 2 credits. Prerequisite: Geol 101 or permission of instructor. Weekly field sessions.

D. E. Karg.

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.

Intercession 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 1984-85. 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.

Western Adirondack Field Course Spring. 1 credit. Offered alternate years.


Mineral and Energy Resources and the Environment Spring. 3 credits. No prerequisites. Offered alternate years.

2 lecs, 1 lab. R. W. Allmendinger. Nature and origin of deformed rocks at microscopic to macroscopic scales, with emphasis on structural geometry and kinematics.

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, W. B. Travers; spring, A. L. Bloom. 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.

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 resources, and mineral resources.

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.

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. L. Turcotte, J. M. Bird.

For description see Engineering Common Courses.

Structural Geology Spring. 4 credits. Prerequisite: Geol 101 or 201, or permission of instructor.

3 lecs, 1 lab, field trips. R. W. Allmendinger. 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

The following, the core courses Geol 326, 355, 356, 375, 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.

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.

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 equilibria 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.


386 Geophysics and Geoelectronics 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 geological 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 388. 3 lecs. L. D. Brown. Structure and composition of the crust from geophysical observations, analysis of xenoliths, and extrapolation of petrological laboratory data. Radios isotopic 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 1985-86. 3 lecs., 1 lab. L. D. Brown. Techniques for inferring geologic structure and lithology from seismic reflection data. Data processing sequences, migration, velocity analysis, correlation criteria, resolution considerations, wave-form analysis, and synthetic seismograms. Interpretation of seismic data. [Seismic stratigraphy.]

442 Glacial and Quaternary Geology Spring. 3 credits. Prerequisite: Geol 345 or permission of instructor. 2 lecs., 1 lab; several Saturday field trips. A. L. Bloom. Glacial processes and deposits and the stratigraphy of the Quaternary.

453 Modern Petrology Fall. 3 credits. Prerequisite: Geol 356. Offered every other year. 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. Examination of metamorphic rocks by literar and petrographic examination of pertinent examples.

455 Isotope Geology Fall. 3 credits. Prerequisite: Geol 356 or equivalent. Not offered 1985-86. 3 lecs., R. W. Kay. Nucleosynthetic processes and the isotopic abundances of the elements. Dating by Pb, Ar, Sr, and Nd isotopes. Applications of isotope ratios as tracers in the earth's hydrosphere and hydrothermal circulation systems.

456 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. 3 lecs., 1 lab, field trip. A. K. Gibbs. 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 1985-86. 3 lecs., field trip. A. K. Gibbs. 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 1985-86. 3 lecs., T. E. Jordan. Compositions, textures, sedimentary structures, and facies variations of sediments in modern depositional environments. Clastic and carbonate environments; fluviol, alluvial-fan, delta, intertidal, submarine-fan, carbonate-bank, and sabkha systems.

476 Sedimentary Basins: Tectonics and Mechanics Spring. 3 credits. Prerequisite: Geol 375 or permission of instructor. Offered alternate years. Not offered 1985-86. 3 lecs., T. E. Jordan. Sedimentation 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. Interprettion of seismic reflection data, and surface deformation; relationships to regional tectonics; earthquake hazard and prediction.

479 Paleobiology Fall. 3 credits. Prerequisites: Biological Sciences 101-102 and 103-104 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, magnetic and electrical methods of exploration.

489 Earthquakes and Tectonics Fall. 3 credits. Prerequisites: Geol 101 or 201, Mathematics 182, Physics 213, or permission of instructor. Offered alternate years. Not offered 1985-86. 3 lecs. B. L. Isacks. The mechanism 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 Senior Thesis Fall, spring. 2 credits. Staff. Thesis proposal to be discussed with director of undergraduate studies during the junior year. Participation requires acceptance of a thesis proposal by the faculty committee.

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.


625 Rock and Sediment Deformation D. E. Karg.
Temperature Experiments

653 Mineralogy and Crystallography, X-Ray Diffraction, Microscopy, High-Pressure/Temperature Experiments

W. A. Bassett.

655 Advanced Topics in Petrology and Tectonics

J. M. Bird, W. A. Bassett.

657 Current Research in Petrology

R. W. Kay.

661 Topics in Mineral Resource Studies and Precambrian Geology

A. K. Gibbs.

671 Advanced Topics in Sedimentology and Stratigraphy

T. E. Jordan.

673 Paleobiology

J. L. Cisne.

680 Seismic Record Reading

B. L. Isacks, M. Barazangi.

681 Geophysics, Exploration Seismology

L. D. Brown.

683 Earthquakes and Tectonics

B. L. Isacks.

685 Exploration Seismology, Gravity, Magnetics

S. Kaufman.

687 Geophysics, Seismology, and Geotectonics

J. E. Oliver.

689 Research on Seismic-Reflection Profiling of the Continental Crust

J. E. Oliver, L. D. Brown, S. Kaufman.

691 Philippine Geology and Tectonics

D. E. Karig.

693 Andes Seminar


695 Computer Methods in Geological Sciences

L. D. Brown, L. B. Isacks.

This course is intended to familiarize students with the growing importance of computers in geological and geophysical research. Students will be required to develop, debug, implement, and document a program relevant to current research in the Department of Geological Sciences using the department's VAX 11/750 or MEGASEIS Seismic Computer. DI-3000 graphics software, an IIS image processor, and numerous graphics and I/O peripherals are also available.

721 Marine Tectonics

Fall. 3 credits. Prerequisites: Geol 326 and a course in geophysics. 3 lecs. D. E. Karig.

Study of geophysical and geological characteristics of the earth's crust beneath the oceans. Emphasis on recent geologic data concerning plate margins in the oceans, island-arc systems, spreading systems, and transforms. Techniques for determining incremental and finite plate rotations. Lectures and reviews of recent papers. Term project and paper required.

722 Advanced Structural Geology

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 will 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.

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 topics 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 1985-86. 3 lecs. D. L. Turcotte.

Wave conduction, heat flow, the driving mechanism for plate tectonics, the energy balance, definition of the lithosphere.

737 Advanced Geophysics II

Spring. 3 credits. Prerequisite: Geol 388. Not offered 1985-86. 3 lecs. D. L. Turcotte.

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&AM 611 or equivalent. Offered alternate years. 3 lecs-2 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. Autotutorial. 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. Crystal structures and crystal defects, stereographic methods. Binary-alloy structures, phase transitions, precipitation hardening, T-T-T diagrams in iron-carbon system. Techniques for materials analysis: X-ray and electron diffraction, optical and electron microscopy. Design of experimental systems for the structural characterization of materials.

332 Electrical and Magnetic Properties of Materials


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 evaluate 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. 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. Fall. 3 credits. Introduction of absolute rate theory, atomic motion, and diffusion. Applications to nuclear 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)

Fall. spring. 3 credits. 3 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. Metallurgical processes for winning high-purity silicon from SiO₂, single-crystal growth, zone melting and zone refining. Burton-Prim-Shirley theory of the effective distribution coefficient, epitaxial growth of silicon. Thermal oxidation of silicon to form SiO₂, mathematical theory 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 diffusion layers by
450 Physical Metallurgy Spring. 3 credits. The service and design requirements of engineering alloys, the testing and characterization of materials, and the properties of important alloy systems. The selection and design of alloys for various engineering requirements, such as ASME design codes.


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, photovoltaic materials, metal 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 interaction of ions, electrons, 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 x-ray emission spectroscopy, ion scattering, and secondary ion mass spectroscopy.

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 metalization. Packaging materials to be discussed include metals, ceramics, and polymers.

Graduate-Level Professional Courses

553 Special Project 553, fall; 554, spring. 6 credits each term. Research on a specific problem in the materials area.

Graduate Core Courses


602 Elasticity and Physical Properties of Crystals Fall. 3 credits. Cartesian tensors, 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. Binding energies in perfect crystals. Structure and energetics of point, line, and planar defects in crystalline materials, including metals, ionic solids, covalent solids, and polymers. Interactions between defects. Bonding and random packing in amorphous materials. Observation of defects in crystalline materials. Structural analysis of amorphous materials.


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 included are theory of plasticity, fracture mechanics, deformation behavior of polycrystal and single-crystal metals, phenomenological theories of deformation, micromechanical theories of plastic flow and creep, relationship of microstructure to mechanical properties, brittle and ductile fracture of materials.

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. Compositional 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 grain-boundary layers. 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-optical microscope, image formation with applications to the direct imaging of small defects and atomic planes. Kinematic 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.
Electronic 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: structural liquids and polymers; morphology of elastomers and glasses; electrical, thermal, and optical properties of amorphous materials. Presented at the level of Modern Aspects of the Viscous 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 AE&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, 622, 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. Atomicistic 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.

705 The Effects of Radiation on Materials 3 credits.
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; channeled 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 metals; 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 fission-fall problem in controlled thermonuclear targets. At the level of Defects and Radiation Damage in Metals, by M. W. Thompson; The Observation of Atomic Collisions in Crystalline Solids, by R. S. Nelson; Ion Bombardment of Solids, by G. Carter and 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. 3 lecs. Photovoltaic energy conversion: (1) theory on the level of Kittel and 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 structure. Crystal structure and bonding of typical ceramic materials; structure of silicate and non silicate 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. 3 lecs. Topics from current research in mechanical properties of structural materials, selected from the following: modern theories of deformation, high-strength alloys, effects of nuclear radiation, 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.

799 Materials Science Research Seminars Fall, spring. 2 credits each term. For graduate students involved in research projects. Short presentations on research in 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

101 Naval Ship Systems (also Naval Science) Spring. 3 credits. Limited to freshmen and sophomores.
R. L. Wolfe
An introduction to primary ship systems and their interrelation. Basic principles of ship construction, Stability, propulsion, control, internal communications, and other marine systems.

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.
2 lecs, 1 lab.
For description see Engineering Common Courses.

221 Thermodynamics (also Engr 221) Fall, spring. 3 credits. Prerequisites: Mathematics 101 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 MSAE 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. Leu

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 preims.
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.

324 Heat Transfer Spring; may be offered in Engineering Cooperative Program; 3 credits. Prerequisite: M&AE 323.

325 Mechanical Design and Analysis Fall, spring, usually offered in Engineering Cooperative Program; 4 credits. Prerequisites: Engr 202 and 203.
3 recs, 1 lab. R. M. Phelan. 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. Prerequisite: M&AE 325.
3 lecs, 1 lab, evening prelims. 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.

Mechanical Systems and Design and Manufacturing

464 Design for Manufacture Spring; 3 credits. Prerequisites: M&AE 311 and 325, or permission of instructor.
R. E. Wehe. Design for casting, forging, stamping, welding, machining, heat treatment, and assembly: beneficial prestressing, importance of 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.

483 Mechanical Reliability Fall; 3 credits. Prerequisites: Engr 260 or 270 or equivalent.

486 Automotive Engineering Spring; 3 credits. Prerequisite: M&AE 325.
Selected topics in the analysis and design of vehicle components and vehicle 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. Fulfills computer applications requirement.
2 lec-recs, 1 computing lab; term project. A broad introduction to computational methods in mechanical design. Problems with emphasis on interactive techniques.

512 Analysis of Materials Processing (also MS&E 455) 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.

513 Materials Engineering Spring; 3 credits. Prerequisite: Engr 261 or permission of instructor. Not offered 1985-86. Students interested in this subject should consider taking M&AE 450, Physical Metallurgy. Designed to promote understanding and provide guidelines in the design, selection, and use of modern engineering materials. Strong emphasis on analysis of composite materials and on failure behavior in modern structures.

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, programming methods for NC and computerized NC (CNC) machine tools with laboratories, economic aspects, and roles in computer-aided design/computer-aided manufacturing (CAD/CAM) systems with graphics.

517 Introduction to Robotics Fall; 3 credits. Enrollment limited; intended for graduate students but open to seniors. Prerequisite: background in vector calculus, rigid body dynamics, and feedback control.

563 Mechanical Components Spring; 3 credits. Prerequisite: M&AE 325. Not offered 1985-86. 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 drive, turbocharger, gears, rotating disks, fits, elastic-plastic design, thermal stresses, creep, impact, indentermate, 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. Further analysis of stress and deformation of elastic bodies, with applications to the analysis and design of mechanical and aerospace components and systems. Topics from advanced strength of materials, applied elasticity, failure theories, and experimental stress analysis.

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 microcomputer-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 for data-acquisition procedures.

577 Mechanical Vibrations Spring; 3 credits. Open to qualified undergraduates. Prerequisite: M&AE 326 or equivalent.
2 recs, 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 recs, 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.

587 Dynamics of Vehicles Fall; offered on demand. 3 credits. Prerequisite: Engr 203. Introduction to the dynamics of ground vehicles, including cars, trucks, tractors, motorcycles, and railroad vehicles. Emphasis is on the handling behavior and stability of the automobile, tire theory, and suspension analysis. Performance and comfort criteria are developed. Further topics are included to reflect interests of the class.

[616 Finite-Element Methods in Thermomechanical Processing Fall; 4 credits. Prerequisites: introductory course work in finite-element methods and elasticity or in analysis of manufacturing processes. Not offered 1985-86.
2 lecs, 1 term project. P. R. Dawson. 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 basic capabilities of modern formulations and on their numerical implementation. Interactions among thermal, mechanical, and material-structure behaviors are presented. Applications are to bulk forming, polymer processing, and material joining.]

665 Analysis of Biomechanical Systems Fall; 4 credits. Prerequisite: M&AE 565 or permission of instructor. 3 lecs. D. L. Bartel. For description see M&AE 465. In addition, students registered in M&AE 565 must complete individual term projects on topics in orthopedic biomechanics.

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 methods for linear elastic and thermal analysis of mechanical and...
aerospace structures. Emphasis on underlying mechanics and mathematics. Components and organization of general-purpose finite-element programs such as NASTRAN and ANSYS. Selected engineering applications. Computing projects.

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 design and performance data. Photoelasticity, strain measurement, photography, vibration and sound measurements, transducers.

676 Advanced Mechanical Vibrations
Fall, on demand. 4 credits. Prerequisite: M&AE 577 or equivalent.
D. L. Taylor.

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.

682 Hydrodynamic Lubrication: Fluid-Film Bearings
Fall, on demand. 4 credits.
J. F. Booker.
Problems of current interest in hydrodynamic lubrication. General topics include viscous flow in thin films, elastohydrodynamic lubrication, 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 composites.

685 Optimum Design of Mechanical Systems
Fall. 4 credits. Prerequisite: graduate standing or permission of instructor.
3 recs. 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 1985-86.
A. R. George.

441 Advanced Thermodynamics with Energy Applications
Spring. 3 credits.
Prerequisite: M&AE 221 and 323 or permission of instructor. Not offered 1985-86.
Review of thermodynamics. Applications to phase changes, heat engines, and combustion. Magnetohydrodynamic and ferrocaloric power generation. Statistical basis of thermodynamic laws and applications to lasers and semiconductors.

449 Combustion Engines
Spring 3 credits.
Prerequisite: Engr 221 and M&AE 323.
3 recs. 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 Aerospal Propulsion Systems
Spring. 3 credits.
Prerequisite: M&AE 323 or permission of instructor. Offered alternate years.
3 recs. 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. Not offered 1985-86.
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 aerodynamics, including incompressible and supersonic flows, flow over bodies, lift, and drag. Shock waves. Courses 530 and 531 are of interest primarily to 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 fluid-dynamics 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.
Navier-Stokes equations for laminar and turbulent flows. Boundary layers, laminar and turbulent; skin friction, separation and transition. Jets and wakes, if time allows.

536 Turbomachinery and Applications
Spring. 3 credits.
Prerequisite: M&AE 323 or equivalent.
3 recs. 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 recs. 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, vehicle explosions, laminar and turbulent premixed and diffusion flames.

554 Solar Energy
Fall. 3 credits.
Prerequisite: Engr 221 or equivalent.
B. J. Conta.

555 Power Systems
Fall. 3 credits. Prerequisite: M&AE 323 or equivalent. Not offered 1985-86.
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. Fundamentals of 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 Fall. 4 credits. Prerequisite: M&AE 601 or equivalent or 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 Micro-meteorology Spring. 4 credits. Open to qualified undergraduates with permission of instructor. Offered alternate years. Not offered 1985-86.]
Z. Warhaft.
Basic principles 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 the Reynolds stress 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.
Discussion of contemporary problems in combustion research, with emphasis on applications of modern experimental and analytical techniques. Typical problems include formation and removal of pollutants in combustion systems, combustion of alternative fuels, coal combustion, and combustion in turbulent flow.

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.

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. 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.

732 Analysis of Turbulent Flows Spring. 4 credits.
Prerequisite: M&AE 601 or permission of instructor.
S. B. Pope.

[733 Stability of Fluid Flow Fall. 4 credits.
Prerequisite: graduate standing or permission of instructor. Offered alternate years. Not offered 1985-86.
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 inviscid and high-Reynolds-number fluid-flow problems. Finite difference and finite element 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 and shocks) 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. Bartel.
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.
Intended for students in M.Eng.(Aerospace) program. Study and discussion of topics of current research interest in aerospace engineering. Individual design projects.
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. Krotsch
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 Lamarche.

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 fusion reactors. Example's 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.

3 lecs. 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 330-334 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. Recommended for seniors and graduate students.
3 lecs. P. L. Auer
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

A number of courses in nuclear science and engineering are offered through the School of Applied and Engineering Physics; see A&EP 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.

203 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 305 form a coordinated, two-term 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. Krotsch
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 Lamarche.

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 fusion reactors. Example's 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.

3 lecs. 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 330-334 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. Recommended for seniors and graduate students.
3 lecs. P. L. Auer
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.
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. 3 lecs.  
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 260 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. 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&IE 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 models. Use of the computer as a tool for statistics is stressed.

472 Statistical Decision Theory  Spring. 3 credits. Prerequisite: OR&IE 370 or equivalent. Not offered 1985-86. 3 lecs.  

499 OR&IE 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&IE. 3 rec labs.  
Students are presented with unstructured problems that resemble real-world situations. Students work in project groups on the formulation of mathematical models, computer analysis of the data and models, and presentation o method. Related topics method. Related topics such as sensitivity analysis, duality, and network programming. Applications include such models as resource allocation and production planning.

520 Operations Research I  Fall. 4 credits. Prerequisite: Mathematics 293 or 221 or equivalent. Intended for graduate students in other fields. Lectures concurrent with OR&IE 320. 3 lecs, 1 rec.  
Formulation of linear programming problems and solutions 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 Operations Research II  Spring. 4 credits. Prerequisite: OR&IE 320 or 520 or equivalent. Intended for graduate students in other fields. Lectures concurrent with OR&IE 321. 3 lecs, 1 rec.  
A variety of optimization methods, stressing extensions of linear programming and its applications but 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 Introduction to Stochastic Modeling  Spring. 4 credits. Prerequisite: OR&IE 260 or equivalent. Intended for graduate students in other fields. Lectures concurrent with OR&IE 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 Queueing Theory and Its Applications  Fall. 3 credits. Prerequisite: OR&IE 361 or permission of instructor. Not offered 1985-86. 3 lecs.  

562 Inventory Theory  Spring. 4 credits. Prerequisite: OR&IE 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&IE 361 and 370 and CS 211, or permission of instructor. Not offered 1985-86. 2 lecs, 1 rec. Data files: 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 statistics 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&IE 370 or equivalent. 3 lecs.  
Control concepts and methods for attributes and variables; process capability analysis; acceptance sampling plans; elementary procedures for variables; acceptance-recification 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&IE 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, pseudo-random-variable 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&IE area. A formal report and oral defense of the approach and solution are required.

625 Scheduling Theory  Spring. 3 credits. Prerequisite: permission of instructor. 3 lecs, 1 rec.  

626 Advanced Production and Inventory Planning  Fall. 3 credits. 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  630, fall; 631, spring. 3 credits each term. Prerequisite: advanced calculus. 3 lecs.  

632 Nonlinear Programming  Fall. 3 credits. Prerequisite: OR&IE 630. 3 lecs.  
Necessary and sufficient conditions for unconstrained and constrained optima. 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.
3 lecs.
Topics in combinatorics, graphs, and networks. These include matching, matroids, polyhedral combinatorics, and optimization algorithms.

[636 Integer Programming Fall. 3 credits. Prerequisite: OR&IE 630. Not offered 1985-86. 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. Not offered 1985-86. 3 lecs.

[639 Convex Analysis Fall. 3 credits. Prerequisite: Mathematics 411 and 431, or permission of instructor. Not offered 1985-86. 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&IE 645. Not offered 1985-86. 3 lecs.
A continuation of OR&IE 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 1985-86. 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.

[662 Advanced Stochastic Processes Fall. 3 credits. Prerequisite: OR&IE 661 or equivalent. Not offered 1985-86. 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. 3 lecs.

[664 Deterministic and Stochastic Control Spring. 3 credits. Prerequisite: OR&IE 661 or equivalent. Not offered 1985-86. 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 Queueing Theory Fall. 3 credits. Prerequisite: OR&IE 660 or equivalent. 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. 4 credits. Prerequisite: OR&IE 670 or equivalent. 3 lecs. 1 rec.
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 1985-86. 3 lecs.
The general problem of statistical decision theory and its applications. Comparison of decision rules; Bayes, admissible, and minimax rules. Problems involving sequences of decisions over time. Use of the sample cdf and other simple nonparametric methods. Applications.]

674 Design of Experiments Spring. 3 credits. Prerequisite: OR&IE 671 or permission of instructor. Not offered 1985-86. 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. Not offered 1985-86. 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.


677 Statistical Selection and Ranking Procedures Spring. 3 credits. Prerequisite: OR&IE 676 or permission of instructor. 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: preference-zone, subset, and other approaches. Single-stage, two-stage, and sequential procedures. Applications. Recent developments.

680 Simulation Spring. 3 credits. Prerequisite: permission of instructor. Not offered 1985-86. 3 lecs.
An advanced version of OR&IE 580, intended for Ph.D.-level students.]
Engineering Mathematics

310 Advanced Engineering Analysis I Fall, spring.
3 credits. Prerequisite: Mathematics 294 or equivalent.
2 lecs, 1 rec.
Ordinary differential equations as applied in engineering context. Analytical and numerical methods. Special functions, initial value, boundary value, and eigenvalue problems in linear partial differential equations, introduction to nonlinear ordinary differential equations. Use of computer algebra and MACSYMA to solve problems.

311 Advanced Engineering Analysis II Spring. 3 credits. Prerequisite: Mathematics 310 or equivalent. Functions of several variables, introduction to complex variables, analytic functions, conformal mapping, method of residues. Application to the solution of Laplace's equation, and transform inversion techniques. Examples drawn from fluid mechanics, heat transfer, electromagnetics, and elasticity.

610 Methods of Applied Mathematics I Fall. 3 credits. Intended for beginning graduate students in engineering and science. An intensive course, requiring more time than is normally available to undergraduates (see T&AM 310-311), but open to exceptional undergraduates with permission of instructor.
3 lecs.
Emphasis is on applications. Linear algebra, calculus of several variables, vector analysis, series, ordinary differential equations, complex variables.

611 Methods of Applied Mathematics II Spring. 3 credits. Prerequisite: T&AM 610 or equivalent.
3 lecs.
Emphasis on applications. Partial differential equations, tensor analysis, calculus of variations.

613 Methods of Applied Mathematics IIIa Fall.
2 credits. Prerequisite: T&AM 611 or equivalent. First of an 8-credit sequence (T&AM 613, 614, 615, 616) that develops advanced mathematical techniques for engineering problems.
Review of complex variable theory, conformal mapping; complex integral calculus; Nonlinear partial differential equations; general theory of characteristics.

614 Methods of Applied Mathematics IIIb Spring.
2 credits. Prerequisite: T&AM 613 or equivalent.
Integral transforms for partial differential equations. Green's function; asymptotics, including steepest descent and stationary phase; Wiener-Hopf technique. Problems drawn from vibrations and acoustics, fluid mechanics and elasticity, heat transfer, and electromagnetics.

615 Methods of Applied Mathematics IVa Fall.
2 credits. Prerequisite: T&AM 611 or equivalent. In context of applications; regular and singular perturbation theory, method of matched asymptotic expansions, two timing (method of multiple scales), WKB approximation.

616 Methods of Applied Mathematics IVb Spring.
2 credits. Prerequisite: concurrent registration in T&AM 614 or equivalent. In context of applications: Hilbert-Schmidt and Fredholm theories of integral equations, Wiener-Hopf equations with application to finite interval, Carleman equation and its generalization, effective approximations.

617 Computer Algebra in Applied Mathematics Fall.
2 credits. Prerequisite: T&AM 610-611 or equivalent and permission of instructor.
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

640 Experimental Mechanics Fall. 3 credits.
1 lec, 1 rec, 1 lab.
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. Supercodes T&AM 550 and 661. Prerequisite: T&AM 610 or equivalent. Introduction to stress, strain, momentum balance, energy principles, balance laws, and selected topics in classical elasticity. Introduction to mechanics of plates and shells. Foundation for advanced courses in elasticity, plasticity, fracture, numerical methods, and elastic waves.

565 Fracture Mechanics Fall. 3 credits.
Prerequisites: T&AM 550 or 664 or equivalent. An introductory course dealing mainly with the mechanics of fracture, but also with microscopic aspects of the mechanical behavior of structural materials. Topics in linear elastic fracture mechanics: crack-tip stress fields, energy balance, fracture criteria, and testing methodology for fracture toughness. Topics in nonlinear fracture mechanics: small-scale yielding, the J integral, crack-tip fields in elastic-plastic materials, and crack growth problems.

752 Topics in Continuum Mechanics Spring. 3 credits.
Prerequisite: T&AM 651. Offered alternate years. Not offered 1985-86.
Polymer rheology using functionals or state variables. Continuum theory for rapid shear flows of granular materials. Chemically driven flows, percolation, and finite deformation in biological porous solids.

757 Viscoelasticity and Creep Fall. 3 credits.
Offered alternate years.

758 Theory of Plasticity Spring. 3 credits. Offered alternate years.


671 Advanced Dynamics Spring. 3 credits. Prerequisite: T&AM 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; KAM theory. This course will use computer algebra (MACSYMA). No prior experience will be assumed.

[672 Celestial Mechanics (also Astronomy 579) Fall. 3 credits. Offered alternate years. Not offered 1985-86.
Two 1 1/2-hour lecs. Description of orbits; 2-body, 3-body, and n-body problems; energy and angular momentum; stability, orbit perturbations, and dynamical stability; 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.

675 Nonlinear Vibrations Fall. 3 credits. Prerequisite: T&AM 574 or equivalent. Offered alternate years.

776 Qualitative Theory of Dynamical Systems Spring. 3 credits. Suggested prerequisite: T&AM 675, Mathematics 517, or equivalent. Offered alternate years.
Review of planar (single-degree-of-freedom) systems. Local and global analysis. Structural stability and bifurcations in planar systems. Center manifolds and normal forms. The averaging theorem and perturbation methods. Melnikov's method. Discrete dynamical systems, maps and difference equations, homoclinic and heteroclinic motions, the Smale horseshoe and other complex invariant sets. Global bifurcations, strange attractors and chaos in free and forced oscillator equations. Applications to problems in solid and fluid mechanics.

Special Courses, Projects, and Thesis Research

491-492 Project in Engineering Science 491, fall; 492, spring. 1-4 credits, as arranged.
Projects for undergraduates under the guidance of a faculty member.

786-797 Topics in Theoretical and Applied Mechanics Fall. 3 credits.
Special lectures or seminars on subjects of current interest. Topics are announced when the course is offered.

798-799 Topics in Theoretical and Applied Mechanics Spring. 3 credits.
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
Albright, Louis D., Ph.D., Cornell U. Assoc. Prof., Agricultural Engineering
Allmendinger, Richard, Ph.D., Stanford U. Asst. Prof., Geological Sciences
Ast, Dieter G., Ph.D., Cornell U. Prof., Materials Science and Engineering
Auer, Peter L., Ph.D., California Inst. of Technology. Prof., Mechanical and Aerospace Engineering
Avdisian, C. Thomas, Ph.D., Princeton U. Asst. Prof., Mechanical and Aerospace Engineering
Babaeghi, Ozalp, Ph.D., U. of California at Berkeley. Asst. Prof., Computer Science
Ballantine, Louis J., Ph.D., Massachusetts Inst. of Technology. Prof., Applied and Engineering Physics
Borchers, Robert E., Ph.D., Columbia U. Prof., Operations Research and Industrial Engineering
Bilardi, Gianfranco, Ph.D., U. of Illinois. Asst. Prof., Computer Science
Billiere, Louis J., Ph.D., City U. of New York. Prof., Operations Research and Industrial Engineering
Birnir, Kenneth P., Ph.D., U. of California at Berkeley. Asst. Prof., Computer Science
Bough, Larry D., Ph.D., Cornell U. Assoc. Prof., Materials Science and Engineering
Brown, Larry D., Ph.D., Cornell U. Assoc. Prof., Geological Sciences
Brelsford, Peter F., Ph.D., U. of California at Davis. Prof., Civil and Environmental Engineering
Coppens, and Sanders.

895 Mathematical Theory of Elasticity Spring. 3 credits. Prerequisite: T&AM 564. Offered alternate years. Not offered 1985-86.
The basic equations of large-deformation elasticity; solution of certain large-deformation problems. Linearized elasticity. Elastic potentials and three-dimensional problems; plane stress by method of Muskhelishvili; conformal mapping; torsion problems.

896 Fundamentals of Acoustics (also EE 442) Spring. 3 credits. 3 lecs, biweekly labs.
Introduction to the principles and theories of acoustics. Vibrations of strings, bars, membranes, and plates; plane and spherical acoustic waves; transmission phenomena; resonators and filters; waves in solids and fluids. Application is made to sonic and ultrasonic transducers, music and noise, and architectural acoustics, and an introduction is given to the digital processing of acoustic signals. Laboratory work is required. At the level of Fundamentals of Acoustics, by Kinser, Frey, Coppers, and Sanders.

[895 Mathematical Theory of Elasticity Spring. 3 credits. Prerequisite: T&AM 564. Offered alternate years. Not offered 1985-86.
The basic equations of large-deformation elasticity; solution of certain large-deformation problems. Linearized elasticity. Elastic potentials and three-dimensional problems; plane stress by method of Muskhelishvili; conformal mapping; torsion problems.]
Clark, Douglas S., Ph.D., California Inst., of Technology.;
Cool, Terrill A., Ph.D., California Inst., of Technology.;
Cfnnway, Harry D" Sc.D., Cambridge U. (England);
Constable, Robert L" Ph.D., U. of Wisconsin. Prof.,
Currency, David E" Ph.D., Princeton U. Prof.,
Mechanical and Aerospace Engineering;
Cisne, John L., Ph.D., U. of Chicago. Assoc. Prof., Geological Sciences;
Clark, David D., Ph.D., U. of California at Berkeley. Prof., Nuclear Science and Engineering;
Clark, Douglas S. S., Ph.D., California Inst. of Technology. Asst. Prof., Chemical Engineering;
Cohen, Claude P., Ph.D., Princeton U. Assoc. Prof., Chemical Engineering;
Coleman, Thomas R. P., 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. Asst. Prof., Agricultural Engineering;
Cook, William J., Ph.D., North Carolina State U. Prof., Agricultural Engineering;
Cool, Terrill A., Ph.D., California Inst. of Technology. Prof., Applied and Engineering Physics;
Dawson, Paul R., Ph.D., Colorado State U. Asst. Prof., Mechanical and Aerospace Engineering;
deBoer, P. Tobias, Ph.D., U. of Maryland. Prof., Theoretical and Applied Mechanics;
Delchamps, David F., Ph.D., Harvard U. Asst. Prof., Electrical Engineering;
Demenes, Alan J., Ph.D., Princeton U. Assoc. Prof., Chemical Engineering;
Dick, Richard D., Ph.D., U. of Illinois. Joseph P. Riley Professor of Engineering, Civil and Environmental Engineering;
Diestrjan, Lestor F., Ph.D., Cornell U. Prof., Electrical Engineering;
Farley, Donald T., Ph.D., Cornell U. Prof., Electrical Engineering;
Fine, Terence L., Ph.D., Harvard U. Prof., Electrical Engineering;
Finn, Robert K., Ph.D., U. of Minnesota. Prof., Chemical Engineering;
Fisher, Gordon P., D.E., Johns Hopkins U. Prof., Civil and Environmental Engineering;
Fleischmann, Hans H., Ph.D., Technische Hoch., Munich (Germany). Prof., Applied and Engineering Physics;
Frey, Jeffrey, Ph.D., U. of California at Berkeley. Prof., Electrical Engineering;
Furry, Ronald B., Ph.D., Iowa State U. Prof., Mechanical and Aerospace Engineering;
Gebremedhin, Kifle G., Ph.D., U. of Wisconsin. Asst. Prof., Agricultural Engineering;
George, Albert R., Ph.D., Princeton U. Prof., Mechanical and Aerospace Engineering;
Gergely, Peter, Ph.D., U. of Illinois. Prof., Civil and Environmental Engineering;
Gibbs, Allan K., Ph.D., Harvard U. Asst. Prof., Agricultural Engineering;
Gilbert, John R., Ph.D., Stanford U. Asst. Prof., Computer Science;
Gosssett, James M., Ph.D., Stanford U. Assoc. Prof., Civil and Environmental Engineering;
Gouldin, Frederick C., Ph.D., Princeton U. Assoc. Prof., Mechanical and Aerospace Engineering;
Greenberg, Donald P., Ph.D., Cornell U. Prof.-at-Large, Engineering;
Gries, David J., Ph.D., Technische Hoch., Munich (Germany). Prof., Computer Science;
Grigorou, Mircio D., Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Civil and Environmental Engineering;
Gubins, Keith E., Ph.D., U. of London (England). Thomas R. Briggs Professor of Engineering, Chemical Engineering;
Gunkel, Wesley V., Ph.D., Michigan State U. Prof., Agricultural Engineering;
Hagfors, Tor, Ph.D., U. of Oslo (Norway). Prof., Electrical Engineering;
Haltiner, Newt C., Ph.D., Cornell U. Prof., Agricultural Engineering;
Hammer, David A., Ph.D., Cornell U. Prof., Nuclear Science and Engineering;
Harper, William B., Ph.D., Massachusetts Inst. of Technology. Fred R. Rhodes Professor of Chemical Engineering;
Hart, Edward W., Ph.D., U. of California at Berkeley. Prof., Theoretical and Applied Mechanics/ Materials Science and Engineering;
Hartmanis, Jiri, Ph.D., California Inst. of Technology. Prof., Computer Science;
Heath, David C., Ph.D., U. of Illinois. Assoc. Prof., Operations Research and Industrial Engineering;
Heegard, Chris, Ph.D., Stanford U. Assoc. Prof., Electrical Engineering;
Holmes, Philip J., Ph.D., Southampton U. (England). Prof., Theoretical and Applied Mechanics;
Hopcroft, John E., Ph.D., Stanford U. Prof., Computer Science;
Hov, Kenneth C., Ph.D., Cornell U. Asst. Prof., Civil and Environmental Engineering;
Huang, Chung Y., Ph.D., Harvard U. Asst. Prof., Theoretical and Applied Mechanics;
Ill-Spong, Marija, Ph.D., Washington U. Asst. Prof., Electrical Engineering;
Ingrafee, Anthony R., Ph.D., U. of Colorado. Assoc. Prof., Civil and Environmental Engineering;
Irwin, Lynne H., Ph.D., Texas A & M U. Assoc. Prof., Agricultural Engineering;
Isacks, Bryan L., Ph.D., Columbia U. Prof., Geophysical Sciences;
Ishibashi, Isao, Ph.D., U. of Washington. Assoc. Prof., Civil and Environmental Engineering;
Jackson, Thomas P., Ph.D., Stanford U. Asst. Prof., Operations Research and Industrial Engineering;
Jenkins, James R., Ph.D., Johns Hopkins U. Prof., Theoretical and Applied Mechanics;
Jewell, William J., Ph.D., Stanford U. Prof., Agricultural Engineering;
Jirka, Gerhard H., Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Civil and Environmental Engineering;
Johnson, C. Richard, Jr., Ph.D., Stanford U. Assoc. Prof., Electrical Engineering;
Johnson, Gregory, Ph.D., U. of Wisconsin at Madison. Asst. Prof., Computer Science;
Johnson, Herbert H., Ph.D., Case Inst. of Technology. Prof., Materials Science and Engineering;
Jordan, Teresa, Ph.D., Stanford U. Asst. Prof., Geological Sciences;
Karig, Daniel E., Ph.D., U. of California at San Diego. Prof., Geological Sciences;
Karpinski, Kevin J., Ph.D., U. of Washington. Assoc. Prof., Computer Science/ Electrical Engineering;
Kaufman, Sidney, Ph.D., Cornell U. Acting Prof., Geological Sciences;
Key, Robert W., Ph.D., Columbia U. Assoc. Prof., Geological Sciences;
Kelley, Michael C., Ph.D., U. of California at Berkeley. Prof., Electrical Engineering;
Kim, Myung-hwan, Ph.D., Yale U. Prof., Electrical Engineering;
Kintner, Paul M., Ph.D., U. of Minnesota. Asst. Prof., Electrical Engineering;
Kohlscheidt, David R., Ph.D., U. of Illinois. Prof., Materials Science and Engineering;
Kozen, Dexter P., Ph.D., Cornell U. Assoc. Prof., Electrical Engineering;
Kramer, Edward J., Ph.D., Carnegie Inst. of Technology. Prof., Materials Science and Engineering;
Krusius, J. Peter, Ph.D., Helsinki U. of Technology (Finland). Assoc. Prof., Electrical Engineering;
Ku, Walter H., Ph.D., Polytechnic Inst. of Brooklyn. Prof., Electrical Engineering;
Kuckes, Arthur F., Ph.D., Harvard U. Prof., Applied and Engineering Physics;
Kulhawy, Fred H., Ph.D., U. of California at Berkeley. Prof., Civil and Environmental Engineering;
Kusse, Bruce R., Ph.D., Massachusetts Inst. of Technology. Prof., Applied and Engineering Physics;
Lance, Richard H., Ph.D., Brown U. Prof., Theoretical and Applied Mechanics;
Lee, Charles A., Ph.D., Columbia U. Prof., Electrical Engineering;
Leibovich, Sidney, Ph.D., Cornell U. Prof., Mechanical and Aerospace Engineering;
Leu, Ming-Chuan, Ph.D., U. of California at Berkeley. Asst. Prof., Mechanical and Aerospace Engineering;
Lewis, Aaron D., Ph.D., Case Western Reserve U. Prof., Applied and Engineering Physics;
Liu, Che-Yu, Ph.D., Cornell U. Prof., Materials Science and Engineering;
Liboff, Richard L., Ph.D., New York U. Prof., Electrical Engineering;
Lippett, James A., Ph.D., Stanford U. Prof., Civil and Environmental Engineering;
Linke, Simpson, M.E., Cornell U. Prof., Electrical Engineering;
Lion, Leonard W., Ph.D., Stanford U. Asst. Prof., Civil and Environmental Engineering;
Liu, Philip L.-F., Sc.D., Massachusetts Inst. of Technology. Prof., Civil and Environmental Engineering;
Ludwig, David C., Ph.D., Purdue U. Assoc. Prof., Agricultural Engineering;
Lucas, Daniel P., Ph.D., Cornell U. Prof., Civil and Environmental Engineering;
Loure, Michel Y., Ph.D., Stanford U. Asst. Prof., Mechanical and Aerospace Engineering;
Loveless, Richard V., Ph.D., Cornell U. Prof., Applied and Engineering Physics;
Ludington, David C., Ph.D., Purdue U. Assoc. Prof., Agricultural Engineering;
Luk, Frank T.-C., Ph.D., Stanford U. Assoc. Prof., Civil and Environmental Engineering;
Lumley, John L., Ph.D., Johns Hopkins U. Willis H. Carrier Professor of Engineering, Mechanical and Aerospace Engineering;
Lynn, Walter R., Ph.D., Northwestern U. Prof., Civil and Environmental Engineering;
MacDonald, Noel C., Ph.D., U. of California at Berkeley. Prof., Electrical Engineering;
McGuire, William M.C.E., Cornell U. Prof., Civil and Environmental Engineering;
McIsaac, Paul R., Ph.D., U. of Michigan. Prof., Electrical Engineering;
Maxwell, William L., Ph.D., Northwestern U. Prof., Operations Research and Industrial Engineering;
Mayer, James W., Ph.D., Purdue U. Francis Norwood Bard Professor of Materials Science and Engineering;
Merrill, Robert P., Sc.D., Massachusetts Inst. of Technology. Herbert Fisk Johnson Professor of Industrial Chemistry, Chemical Engineering;
Meyers, Armin H., Ph.D., Northwestern U. Prof., Civil and Environmental Engineering;
Miller, William F., Ph.D., Cornell U. Prof., Agricultural Engineering.
Graduate School

Administration

Alison P. Casarett, dean
Gerard H. Cox, associate 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 granted by a faculty or university of recognized standing or have completed studies equivalent to those required for a baccalaureate degree at Cornell;
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 regarding 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. Dunin, assistant dean for academic affairs
Allan A. Leniniti, director of business and administration
Michael H. Redlin, graduate faculty representative
Melinda Cock, director, M.P.S. program
Cheryl S. Farrell, director of admissions and financial aid
Harry R. Keller, director of alumni affairs
Fred Artil, director of placement and corporate relations
Joan S. Livingston, executive editor, The Cornell Hotel and Restaurant Administration Quarterly
Mary K. Milis, registrar
Margaret J. Oaksford, librarian
Maureen McKenna, external-programs director
Fred L. Conner, editor of school communications

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 full stage facilities. This provides the school with classrooms, lecture rooms, laboratories, a video and computer center, auditoriums, and offices 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 Vehling collections.

Statler Inn, the school's practice-management facility, contains fifty-one guest rooms; a ballroom; a fully equipped and computerized front office; a cocktail lounge; and a variety of restaurants, including a formal dining room, private dining rooms, two self-service restaurants, and a snack bar.

The Inn's facilities provide a realistic laboratory for the instruction of students in the operational procedures and managerial responsibilities of the hospitality industry. The school offers its students both theoretical and practical instruction through the use of Statler Inn.

Built in 1984, the Binenkorb Video and Computer Center facilitates student training in computing and provides access to video equipment. More than thirty-five 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 the center has been designated the permanent home of the center has been designated the permanent home of the center has been designated the permanent home of the worldwide-travel films. Some of these films have won awards and 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, 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. Some students receive firsthand training through the operation of Statler Inn.

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, can be further enriched with a broad selection of elective courses offered by the school and elsewhere in the University. For instance, the student who wants to specialize in financial management, food and beverage management, or any other area should consult the list of elective courses offered within the school and the index of courses offered by other University divisions.

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 Annoucement of the Graduate School or contact Professor Michael H. Redlin, the school's graduate faculty representative.

Requirements for Graduation

Regularly enrolled students in the School of Hotel Administration are candidates for the degree of Bachelor of Science. The requirements are:

1) completion of eight terms in residence;

2) completion, with a minimum average of 2.0, of 122 required and elective credits, as set forth in the catalog;

3) completion of two units of practice credit prior to the last term of residence, as defined below;

4) completion of the University requirement in physical education during the first two terms of residence;

5) 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 required courses account for 80 of the 122 credits needed for graduation. From the hotel electives, some combination of courses totaling at least 14 credits must be taken. The remaining 28 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 courted 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 28-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 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 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, every 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

Specifically required courses* Credits

Administrative and general management: Hotel Administration 101 0

Human-resources management: Hotel Administration 111, or Psychology 101, Hotel Administration 211 6

Accounting and financial management: Hotel Administration 121, 125, 221, 222 13

Food and beverage management: Hotel Administration 131, 132, 231, 233, 331 12

Law: Hotel Administration 341, 344 6

Properties management: Hotel Administration 252, 356, 357 13

Communication: Hotel Administration 165, 265 6

Science and technology: Hotel Administration 171, 172, 173, 174 12

Economics, marketing, and tourism: Hotel Administration 281, 282, 384 9

Humanities and social sciences electives 6

Specifically required credits 80

Hotel electives 14

Free electives 28

Total credits required for graduation 122

*Since the school is currently involved in the process of a major curriculum reorganization, the requirements for graduation will be revised for entering students. Students should consult with their adviser or the school's registrar for the specific requirements that apply to them.
Undergraduate Program of Study

This typical arrangement of courses, year by year, is offered for illustration.

<table>
<thead>
<tr>
<th>Year</th>
<th>course codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td>H Adm 304, Rooms-Division Management— Continuing being revised and expanded. In some cases, the numbers of old and new courses overlap. Students are reminded that the most accurate information regarding courses offered during any given semester may be found in the supplement issued for that semester by the school's registrar.</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td></td>
</tr>
<tr>
<td>Junior Year</td>
<td></td>
</tr>
<tr>
<td>Senior Year</td>
<td></td>
</tr>
</tbody>
</table>

Specifically required courses

<table>
<thead>
<tr>
<th>course codes</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 382, Cases in Hospitality Marketing</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 384, Tourism II</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 322, Investment Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 323, Financial Analysis and Planning</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 204, Franchising in the Hospitality Industry</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 384, Tourism I</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 285, Hotel Sales</td>
<td>1</td>
</tr>
<tr>
<td>H Adm 342, Law of Business II</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 306, Hospitality Industry Real Estate</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 301, Development of a Hospitality Property</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 353, Introductory Food-Facilities Engineering Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 338, Purchasing</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 337, Survey of Beverages</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 333, Restaurant Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 336, Purchasing</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 354, Food-Facilities Equipment Design and Layout</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 364, Advanced Business Writing</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 382, Cases in Hospitality Marketing</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 401, Seminar in Management Principles</td>
<td>1</td>
</tr>
<tr>
<td>H Adm 406, Integrated Studies in the Hospitality Industry</td>
<td>1</td>
</tr>
<tr>
<td>H Adm 421, Internal Controls in Hotels</td>
<td>4</td>
</tr>
<tr>
<td>H Adm 453, Energy-Management Techniques</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 454, Seminar in Hotel Planning</td>
<td>4</td>
</tr>
<tr>
<td>H Adm 455, Seminar in Restaurant Planning</td>
<td>4</td>
</tr>
<tr>
<td>H Adm 601 – 602, Management Intern Program</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 620, Undergraduate Independent Research in Human-Resources Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 630, Undergraduate Independent Research in Food and Beverage Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 640, Undergraduate Independent Research in Law</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 650, Undergraduate Independent Research in Properties Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 660, Undergraduate Independent Research in Communication</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 670, Undergraduate Independent Research in Science and Technology</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 680, Undergraduate Independent Research in Economics, Marketing, and</td>
<td>2</td>
</tr>
<tr>
<td>Tourism</td>
<td></td>
</tr>
</tbody>
</table>

Programs in Special Areas

While completing the required courses leading to the bachelor's degree, undergraduates in the school have the option of concentrating their studies in a major area of instruction. These include administration, financial management, food and beverage management, hotel and motel planning and design, management, marketing, and food science, among others.

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.

Undergraduate Elective Courses in Hotel Administration

<table>
<thead>
<tr>
<th>course codes</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative and General Management</td>
<td>1</td>
</tr>
<tr>
<td>H Adm 102, Lectures in Hotel Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 200, Personal Real-Estate Investments</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 205, Resort and Condominium Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 305, Rooms-Division Management— Housekeeping and Laundry Operations</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 304, Rooms-Division Management— Front Office and Reservations</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 311, Union-Management Relations in Private Industry</td>
<td>3</td>
</tr>
</tbody>
</table>

*Fourteen credits of hotel electives are to be taken during the four-year undergraduate program.
Candidates for the Master of Science or Doctor of Philosophy degrees should refer to the admission and degree requirements set forth in the Announcement of the Graduate School. The student's program is developed with the aid and direction of a special committee, chosen by the student from members of the Graduate Faculty. This committee also approves the thesis.

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 may be counted as hotel electives. The first 6 credits of a modern foreign language taken at Cornell University may be counted as hotel electives rather than as free electives. The school offers three courses in a foreign language. (See H Adm 166, XXX, and 266.) Further information on foreign language courses at Cornell and placement in language courses may be found in the College of Arts and Sciences program description under the Modern Languages, Literatures, and Linguistics section and also under the section Advanced Placement for Freshmen.

Graduate Curriculum

Mastery of a foreign language is particularly desirable for students who are planning careers in the hotel or restaurant industry. Foreign language study at Cornell is characterized by small classes and emphasis on the spoken language. Students supplement their course work with study in a well-equipped language laboratory.

The first 6 credits of a modern foreign language taken at Cornell University may be counted as hotel electives. The student's program is developed with the aid and direction of a special committee, chosen by the student from members of the Graduate Faculty. This committee also approves the thesis.

Directed Study

Independent Research

Students may conduct independent research projects in any academic department 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 hotel electives during the undergraduate years. Additional directed study is credited against free electives, with the exception of the management-intern program of 12 credits. 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. 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 the Statler Inn on the University campus. Students receive both academic credit and practicum credit, 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.

Administrative and General Management Courses

101 Orientation Fall or spring. No credit. Required of all new hotel students and open to students sponsored by the hotel school to the Division of Unclassified Students. S-U grades only. F 1:25-5. Assistant dean Dunn.

An introduction to the school, Statler Inn, and the various facets of the hospitality industry.

102 Lectures in Hotel Management Fall. 1 credit. Limited to School of Hotel Administration students except by written permission. Hotel elective. F 1:25. Dean J. J. Clark.

A series of lectures given by nonresident speakers prominent in the hotel, restaurant, and allied fields.

203 Club Management Fall or spring. 7 weeks only. 2 credits. Hotel elective. T 1:25-5. Faculty.

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 interface with board of directors and committees, recreation management, labor management, and marketing of major tournaments.


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. Hotel elective. M W F 9:05. M. A. Norden.

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 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.

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Students should discuss their plans with the school's study abroad representative so that all petition and credit evaluation procedures are followed.
- Designed to provide the student with a comprehensive introduction to the insurance field. The emphasis is on fire insurance, casualty insurance, and multiple-peril policies. Covered are such topics as the law of contracts, insurance principles, the fire insurance policy and fire insurance forms, business-interruption, marine, burglary, crime, and liability insurance; rates and rate making; bonds; negligence and torts; compensation; package policies; adjustment of losses; and types of insurers.

300 Personal Real-Estate Investments Fall or spring. 3 credits. Limited to juniors and seniors from outside the School of Hotel Administration. Hotel students who have taken H Adm 306 may take H Adm 300 as a free elective.
M 10:10–12:05; 1 hour TA rec as scheduled. D. Sher.
Lectures and case studies cover the advantages and disadvantages of real-estate investments and how to maximize gain and minimize risk and possible loss. Subjects covered include (1) the economics of real estate, tax shelters, financial leverage, (2) types of personal real-estate investments; (3) risk analysis, cash flow, and return on investment; (4) sources of financing; (5) joint ventures and syndications; and (6) acquisition and development of real estate. Recitation sessions will deal with the methodology and calculations of real estate analyses.

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.

304 Rooms-Division Management—Front Office and Reservations Fall. 7 weeks only 2 credits. Hotel elective. Estimated cost of field trip to Washington, D.C., $100.
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.

F 1:43–30. Faculty and visiting lecturers.
This course will present an operational view of the housekeeping and laundry functions of a hotel.]

306 Hospitality-Industry Real Estate Fall or spring. 3 credits. Prerequisites: H Adm 21, 225, 281, 282, or equivalent, or written permission of instructor. Hotel elective.
A practical survey of real estate as capital investment in the hospitality industry. Monday lectures cover the role and importance of real estate in the retail environment; the relationship of real estate to the marketing strategy of a company and its investment objectives in the real estate division and merchandising of real estate; the financing of real estate; and the effects of real-estate financing on a company's overall corporate financial structure and on its future borrowing ability. Tuesday recitations will deal with application of these subject matters through case studies, financial analyses, role playing sessions, and the like.

401 Seminar in Management Principles Fall. 2 credits. Limited to 20 seniors and graduate students. Prerequisite: H Adm 302. Hotel elective.
This course uses the case-study approach, and each student prepares a comprehensive analytical report, based on previous work, for class discussion and analysis. Subject line 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 Hotel-Management Seminar Fall. 1 credit. Limited to 20 seniors and graduate students. Hotel elective.
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 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. 3 credits or equivalent Hotel elective. Approximate cost of field trips, $25.
T R 2:30. S. A. Mukhoski.
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 project, selected readings, and field exercises.

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, $75.
F 10:10–12:05. R. M. Chase.
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 operations oriented toward productivity analysis. A required field trip to the participating hotel is 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.

408 Casino Management Fall. 2 credits. Limited to 50 School of Hotel Administration seniors and graduate students. Hotel elective. Estimated cost of field trip, $100.
The objective of this course is to provide the student with an understanding of the management responsibility of casino operations and of the operational differences between and, management philosophies of, casino and noncasino hotels. Overview and analysis of casino administration, with emphasis on relationships and responsibilities of hotel general manager and the casino manager, marketing and junkets, physical design, licensing, government regulation, personnel and training, internal controls, and security systems. Includes field trip to Bally's Park Place Casino hotel in Atlantic City.

701 Graduate Seminar in Hotel Operations Fall. 2 credits. Limited to 30 graduate students. Hotel elective. Estimated cost of field trip, $75.
Intended to provide 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. This 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 operations oriented toward productivity analysis. A required field trip to the participating hotel is 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.

Human-Resources Management Courses

211 Management of Human Resources Fall or spring. 3 credits. Prerequisite for hotel students: H Adm 111. Required.
Leoc, M W 11:15, 12:20, or 1:25; 1-hour lab to be arranged. D. A. Demodero.
A practically oriented approach to the problems of personnel management, starting with an introduction to the personnel function followed by the selection and placement of personnel; the role of supervision with emphasis on induction, training, communications, performance appraisal, and leadership style; a study of age and salary administration; motivation; and a discussion of union-management relations. Emphasis will be placed on class discussion and business and industry. (There will be two evening prelims. There will be two Saturday morning classes of two hours duration scheduled with special guest speakers.)

311 Union-Management Relations in Private Industry Fall. 3 credits. Limited to juniors, seniors, graduate students, and those who have received written permission of the instructor. Hotel elective. T 1–2:15. F. A. Herman.
Major areas of study include the development of the trade-union movement in the United States, with emphasis on the history and structure of unions active in all phases of the hospitality industry, federal and state laws governing the bargaining relationship, including the role of the National Labor Relations Board; the collective-bargaining process; labor-management negotiations and contract administration and the critical role of conciliation procedures (such as mediation and arbitration) in keeping industrial peace.

313 Training for the Hospitality Industry Spring. 3 credits. Limited to 24 students. Prerequisite: H Adm 211. Hotel elective.
M W 10:10 plus 1 hour to be arranged. F. Berger.
Training is a fundamental responsibility of hospitality managers and a primary solution to human-resource management problems. The training function within the hospitality industry will be analyzed, and a training and employee-development model will be presented. Related subjects such as learning theories, task analysis, the writing of objectives, training methods, and program evaluation will be covered at both the
121 Financial Accounting Fall or spring. 3 credits. Required. Limited to School of Hotel Administration students.

Lecs. T R 10:10; 1-hour lab to be arranged.
D. H. Ferguson.

An introduction to the basic principles of accounting, involving transactions analysis, flow of accounting data to the financial statements, and careful consideration of accounting for revenues, expenses, assets, liabilities, and owner equity.

125 Finance Fall or spring. 3 credits. Prerequisite: H Adm 121 or equivalent. Required.

M W 1:25; 1-hour F lab to be arranged. R. M. Chase.

An objective study of the financial function in profit-oriented enterprises. Important concepts include cash flow, the time value of money, and capital budgeting. Emphasis is on the 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; F 11:15: Faculty.

An introduction to the basic principles of accounting, involving transactions 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 or spring. 3 credits. Prerequisites: H Adm 121 and 125, or equivalent.

Lecs. M W 10:10; 2-hour lab to be arranged. Two evening exams are to be arranged. A. N. Geller.

The overall objective is the use of accounting information for managerial planning, control, and evaluation. Particular emphasis is on differential accounting and its role in extracting relevant decision variables. Other topics are accounting systems, behavior of costs, budget preparation, standard costs, the analysis of variance from standard costs, and performance reports.

222 Hospitality Financial Management Fall or spring. 4 credits. Limited to 160 students. Prerequisite: H Adm 121, 125, and 221 or equivalent. Required.

Lecs. T R 8:15–9:30; 1-hour lab to be arranged.
J. J. Eyster.

Methods of operational analysis for hospitality properties are evaluated and utilized in ratio, comparative, and cost-volume-profit analyses. Other topics include internal control, operational budgeting, and the use of feasibility studies in long-term capital-budgeting decisions. Stress is placed upon the student’s ability to communicate analytical results through the use of management letters.

321 Hospitality Management Contracts Fall. 7 weeks only. 1 credit. Hotel elective. Not offered - Fall and Spring.

J. J. Eyster and guest lecturers.

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 capital-asset, pricing theory, and the practical aspects of security analysis and investment management. Computer-assisted analysis is discussed and applied in a realistic manner using interactive computer programs. Background in economics, accounting, and finance recommended.

323 Financial Analysis and Planning Fall. 3 credits. Prerequisite: H Adm 222. Hotel elective. Not offered - Fall and Spring.


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 relevant to that environment. Focus is 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.

324 Financial Charts and Graphs Spring, weeks 2–8. 1 credit. Limited to students. Prerequisite: H Adm 251 and 221. Hotel elective.

Hours to be arranged. Faculty.

An introduction to, and concentrated study of, financial charting—the visual presentation of quantitative data. Includes a review of the several types of charts and graphs and their use to show relative or proportionate amount, trend, etc. Students analyze and evaluate charts from annual reports and the media, and design charts to communicate data effectively.

328 Cost Accounting Fall or 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 and by-products, transfer pricing, 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 Fall or spring. 7 weeks only. 2 credits. Limited to seniors, graduate students, and others who have received permission of instructor. Prerequisite: H Adm 122, 722, or equivalent. Hotel elective.

T R 9:05, A. N. Geller.

Discussion of problems encountered in distributing the accounting and clerical work in hotels so as to provide a good system of internal control. Study of many actual cases of the failure of internal control and analysis of the causes of the failure. Practical problems and actual techniques of functioning systems of internal control are examined.

422 Taxation and Management Decisions Fall. 2 credits. Limited to 50 juniors, seniors, and graduate students. Hotel elective.

W 1:20–2:15; 1-hour rec to be arranged.
J. A. Sciarabba.

An introduction to tax advantages and disadvantages of various organizational structures, including proprietorships, partnerships, Subchapter S corporations; financial-information reporting to tax authorities and shareholders and how they differ; use of depreciation methods to achieve tax reductions, syndication techniques; and the role tax laws play in promoting private investment and development.

722 Graduate Managerial Accounting in the Hospitality Industry Fall or spring. 3 credits. Required M.P.S. course.

T R 2:30–4:25; J. J. Eyster.

Hotel and restaurant accounting systems that provide decision-making information to management are reviewed. Methods of operational analysis for hospitality properties are evaluated and utilized to include ratio, comparative, and cost-volume-profit analysis. Other topics include internal control, operational budgeting, and the use of feasibility studies in long-term capital-budgeting decisions. Stress is placed upon the student’s ability to communicate analytical results through the use of management letters.
723 Graduate Corporate Finance Fall. 4 credits. Prerequisite: H Adm 722. Recommended: knowledge of algebraic techniques and elementary statistics (students who have not recently had a statistics course are urged to purchase and study programmed review books in mathematics and elementary statistics). A list of recommended books (available at the Campus Store) will be distributed at registration. Required M.P.S. course.

Lec, T R 2:30-4:25; 2-hour sec to be arranged A. Arbel.

An introduction to the principles and practices of business finance, including the development of theory and its application in case studies. Specific topics include types of securities and their uses, valuation concepts, capital budgeting, cost of capital, capital structure, dividend policy, long-term financing and bank relations, short- and intermediate-term financial management, and mergers and consolidations. Computer-assisted decision support modules are presented in a realistic manner using interactive packages.

724 Analysis and Interpretation of Financial Statements Spring. 3 credits. Open to seniors and M.P.S. students with permission of instructor prior to enrollment. Hotel elective.


The course will cover recent financial accounting issues that are encountered in reporting the results of operations for corporate enterprises. Accounting principles as well as future extensions will be explored and discussed. Emphasis will be on the components of financial statements, how and why they are reported, and their impact on the overall financial position of the firm and its acceptance in capital markets. The underlying objective of the financial statement expertise will be to analyze a firm as a whole and interpret that analysis. Emphasis will be on both outsiders' views of the company and decision making through interpretation of the statements.

729 Graduate Investment Portfolio Management Spring. 3 credits. Limited to 20 students. Prerequisites: background in economics (H Adm 281, 282 or equivalent [222], 723 or equivalent [323]); undergraduates with adequate background and special motivation may be accepted—interview with, and written permission of, instructor required.

Lec, T R 2:30-4:25. A. Arbel.

The course will cover institutional and analytical aspects of security analysis and investment management, with special emphasis on the hospitality industry: securities, methods of investment information, risk-return analysis, bond and stock valuation models, behavior of security prices, portfolio analysis, and portfolio management.

Food and Beverage Management Courses

132 Food-Production Techniques Fall or spring. 1 credit. Prerequisite: H Adm 331. Required.

Course designed for students with 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 and student-developed case studies, the students will visit and analyze various independently owned restaurant operations. Emphasis will be on the restaurant's 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/case presentations. The student can expect to incur expenses over the term of the semester no more than $250 due to the field trips.

433 Food-Service Management in Business-, Industry-, and Health-related Facilities Fall or spring. 3 credits. Required. Limited to 35 seniors and graduate students. Prerequisites: H Adm 331 or 372, or equivalent. Recommended: a nutrition course. Hotel elective. Estimated cost of required field trip, $150. Not offered fall 1985.

Fall or spring. 3 credits. S-U grades only. Open to juniors and seniors in the Hotel. Field trips to various independently owned restaurant operations. Emphasis is in operation, is an integral part of the student's work. 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 and student-developed case studies, the students will visit and analyze various independently owned restaurant operations. Emphasis will be on the restaurant's 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/case presentations. The student can expect to incur expenses over the term of the semester no more than $250 due to the field trips.

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Fall or spring. 3 credits. S-U grades only. Open to juniors and seniors in the Hotel. Field trips to various independently owned restaurant operations. Emphasis will be on the restaurant's 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/case presentations. The student can expect to incur expenses over the term of the semester no more than $250 due to the field trips.

433 Food-Service Management in Business-, Industry-, and Health-related Facilities Fall or spring. 3 credits. Required. Limited to 35 seniors and graduate students in all other colleges.

W 2:30-4:25. S. A. Mutkoski.

The student will be considering a career as an entrepreneur. Under the supervision of the instructor, using required readings and student-developed case studies, the students will visit and analyze various independently owned restaurant operations. Emphasis will be on the restaurant's 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/case presentations. The student can expect to incur expenses over the term of the semester no more than $250 due to the field trips.

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The student will be considering a career as an entrepreneur. Under the supervision of the instructor, using required readings and student-developed case studies, the students will visit and analyze various independently owned restaurant operations. Emphasis will be on the restaurant's 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/case presentations. The student can expect to incur expenses over the term of the semester no more than $250 due to the field trips.
437 Seminar in Cultural Cuisines  Fall or spring. 3 credits. Limited to 20 students. Prerequisites: H Adm 331 or 732 and permission of instructor. Hotel elective.

This course will present state-of-the-art food and beverage systems, from menu planning through service, and to give the student confidence in presenting the preparation of menus.

731 Food and Beverage Management  Fall or spring. 3 credits. Limited to hotel students. Required. M.P.S. course. Estimated cost of field trip, $100.

Lecs, T R 11:15–12:30. Three evening classes to be arranged. S. A. Mutkoski.

This course will present state-of-the-art food and beverage knowledge, skills, and attitudes that are being practiced in the hospitality industry. Upon completion 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. Prerequisites: H Adm 771, 731, and 773 (possible corequisites). Required. M.P.S. course. Estimated expense for clothing and utensils, $95.

Lecs, T 9:05–12:05; 8-hour F lab (2:30 to closing). J. B. Knight and faculty.

Students are responsible for production and service of dinner for the Statler Inn Room Main Dining Room. The course is designed to teach and apply the fundamentals of food-service operations, 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.


Purchasing, receiving, storage, utilization, and cost analysis of meat, fish, poultry, and meat extenders and analogs are discussed from the standpoint of commercial food service. Federal inspection and grading programs, composition and structure, and preservation methods are covered. Seminar-lab combination.

Law Courses

[247 Law and the Woman Employee  Spring. 3 credits. Hotel elective. Not offered 1985–86. (Hours to be arranged.) J. E. H. Sherry.

Designed to enable management to deal with the legal problems of female employees, from these problems affect the hospitality industry and to provide information regarding the emerging legal rights of women generally.)


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.

342 Law of Business II  Spring. 3 credits. Open only to juniors, seniors, or graduate students. M W F 12:20. J. E. H. Sherry.

Laws pertaining to the Uniform Commercial Code, bailments, trusts and estates, transfers of will, unfair competition and trade regulation, bankruptcy, and insurance.


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 laws as applicable to the hospitality industry. Problems will be drawn from hotel, restaurant, and related businesses.

344 Law of innkeeping  Fall or spring. 3 credits. Limited to juniors and seniors. Prerequisite: H Adm 341 or equivalent. Required. M W F 9:05. J. E. H. Sherry.

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.

Properties Management Courses

252 Facilities Development and Planning  Fall or spring. 4 credits. Required. T R 11:15–12:30 plus 2-hour lab. Faculty.

This lecture-studio course is an introduction to the development and planning of hospitality facilities and properties management. Course components include graphic presentation techniques, the project development sequence, site analysis, conceptual planning, program development, budgeting, fundamental space-planning issues, and architectural design principles for the hospitality industry. Students achieve basic graphic skills, interpret architectural documents, and develop schematic layouts for lodging and dining spaces.

353 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 before course registration. 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 covered. The 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-sized hotel are developed. Emphasis on preparing a program, developing equipment layouts, and making presentations to clients.

356 Building Engineering Systems  Fall or spring. 3 credits. Prerequisite: H Adm 252 or 751 or written permission of instructor. Required. M W F 12:20, 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 legal and ethical responsibilities of the hospitality industry. Problems will be drawn from hotel, restaurant, 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. Required. Prerequisite: H Adm 356. Required. M W F 12:20, plus 2-hour lab. A. Compton.

Construction and management of construction contracts, bid procedures and analysis, management of new and renovation projects, and construction and materials and methods. Organization and management of the PMSE department, security and life-safety systems, and routine and preventive maintenance. This course requires the students to apply 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 food and beverage. Case studies, recitation assignments, and projects are an integral part of the course.

452 Seminar in Interior Design  Spring. 3 credits. Limited to 12 juniors, seniors, and graduate students. 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 Techniques  Spring. 2 credits. Limited to 20 students. Prerequisite: H Adm 356 or 752 or written permission of instructor. Hotel elective.

M 7–9:30 p.m. D. M. Stipanuk.

Energy audit, management, and conservation methods for hotels and restaurants will be considered. Simple computer programs (no programming) will be used to help illustrate methods. A framework for developing an energy-management program will be developed. Students will conduct an energy audit of either a hotel or restaurant.

454 Seminar in Hotel Planning  Fall. 3 credits. Limited to 12 students. Prerequisites: H Adm 252 or 751. Hotel elective. A field trip may be required; estimated cost, $200.


A seminar course intended to acquaint the student with the hotel planning process. The emphasis will be on program development, site selection, conceptual design, and building systems. Discussion includes space allocation, hotel equipment and furnishings, space planning, interior design, and renovation. Students will conduct an energy audit of either a hotel or restaurant.

455 Seminar in Restaurant Planning  Fall or spring. 3 credits. Limited to 12 students. Prerequisites: H Adm 356 and written permission of instructor. Hotel elective. Estimated cost of optional field trip, $150.


A seminar course intended to acquaint the student with the procedures followed in the planning of a restaurant facility. Primary emphasis is on design, engineering, and construction. Discussions of space allocation, trade practices, building and health codes, equipment and furnishings, cost estimations, and management responsibilities when working with professional planners. Case studies are used, and a project is developed.

659 Fire Prevention and Safety Control for the Hospitality Industry  Fall. 1–2 credits. Limited to juniors, seniors, and graduate students only. Hotel elective.

M 7–9:30 p.m. D. M. Stipanuk.
This course presents a coordinated approach to managing the risk associated with fire protection and prevention, safety and security problems specifically for the hospitality industry. Case studies are used to identify major exposures to accidental loss, including property damage, personnel accidents, and losses arising out of third-party liabilities. Fire protection and prevention issues are emphasized.

375 Project Development and Construction Fall or spring. 3 credits. Required. M.P.S. course. Lecs.: T R 1:25; 2-hour lab to be arranged. R. H. Penner. The major elements of project development and the construction process are presented and developed from an engineering-management viewpoint. Topics include feasibility studies, functional planning and design, financing techniques, the bidding process, construction contracts, project scheduling, and building construction. Planning and design approaches for different hotel market segments are explored.

Communication Courses

161 Keyboarding-Typewriting Fall or spring. 2 credits. Limited to 35 students per section. Hotel elective. M W F 10:10, 11:15, or 12:20; or T R F 9:05. B. B. David. A beginning course in electric keyboarding designed for those students who wish to learn touch typing. Recommended for students who plan to take a computer course. Students will be introduced to correct typing techniques for centering, tabulation, manuscripts, and letter styles.

165 Introduction to Writing for Business Fall or spring. 3 credits. Required. Limited to 20 students. Required. Please note: Because of the class-size limitation, a student who chooses to drop this course should notify the instructor no later than the end of the first week of class. A student cannot fill the opening. Must be completed in the freshman year. M W F 9:05, 10:15, or 11:15; J. F. Lumley. C. Bardaraco, G. D. Flash, L. Sharp. Written reports provide the information people in organizations need to make 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 delivery techniques. 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.

261 Report Typing Fall or spring. 2 credits. Limited to 24 students. Prerequisite: H Adm 161 or equivalent. Hotel elective. Not offered fall 1985. M T R 10:10; M W F 1:25. B. B. David. A course in electric typing designed for those students who wish to increase their efficiency, speed, and accuracy. Special emphasis is placed on the typewritten report as a form of communication. Business letters are typed in various styles, and their effectiveness is studied.

265 Effective Oral Communication Fall or spring. 3 credits. Limited to 25 students a section. Required. Lecs.: M W F 9:05–11 or W 9:05–11; and R 9:05 or 10:10. Individual conferences arranged throughout the term. F. A. Herrman. This seminar is designed to help 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 classroom interaction, case studies, debates, and individual and group videotaped presentations.

266 Continuing French: Le Francais de l'Hoteillerie (also French 1235) Fall or spring. 4 credits. Limited to 12 students in each recitation section. Prerequisites: French 122 or equivalent and written permission of instructor. Hotel elective. Lec., T 10:10, sec., M W R F 10:15 or 11:15. A. Levy. This course offers continuing study in an organization-language, in the context of business affairs, with specific emphasis on the hospitality industry. Presentation of material will consider cultural, geographic, economic, governmental, and social contexts within which the business functions. The course will be conducted in French, emphasizing a conversational approach. Specialized situations and terminology will be covered in an organization. Other themes include the student's 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 0.05–11. D. G. Flash. This course focuses on the written communications that demand special persuasiveness and control of tone. Some examples are advertising, public relations, letters that are analyzed, evaluated, and written are negative messages such as refusals, rejections, and responses to complaints; persuasive administrative messages to other subordinates, within 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 credit. Limited to 20 graduate students. Hours to be arranged. Faculty. This course focuses on helping students in three areas: (1) making extemporaneous presentations on business topics with effective presentation design and delivery techniques; (2) selecting appropriate audiovisual aids 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.

Science and Technology Courses

173 Food-Service Microbiology Fall or spring. 2 credits. Required. Please note: Because of lab-size limitation, a student who chooses to drop this course should notify the instructor no later than the first week of class (before labs begin) so another student can fill the opening. Lec., T 1:25; 2-hour lab to be arranged. B. Richmond. The causes and prevention of food spoilage and food-borne disease. Sanitary principles applied to the food-service industry. Specific areas covered are hotel systems, wide-based reservations systems, communications, and food and beverage systems. Laboratories will provide actual experience with computer-based systems.

274 Business Computer Systems Design Fall or spring. 3 credits. Hotel elective. Prerequisite: H Adm 171 or 172 or equivalent chemistry courses. Hotel elective. M W F 10:10, 11:15; 2-hour lab to be arranged. 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.

277 Graduate Food Chemistry Fall or spring. 4 credits. Required. M.P.S. course. Lec., M W F; 3-hour lab to be arranged. T. Neuhaus. The chemistry of fats, carbohydrates, and proteins is emphasized in relation to food products and food production techniques. Additives in foodstuffs, colloidal phase concepts, food processing and production techniques are studied. Heat transfer and energy as they relate to food chemistry are discussed.


279 Computers and Hotel Computing Applications Fall or spring. 3 credits. Limited to 30 students. Required. M.P.S. course. Lecs., M W 3:30–4:25, 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 writing control programs. 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 and 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.
Economics, Marketing, and Tourism Courses

281 Macroeconomics Fall or spring. 3 credits. Required.  
Modern economic problems are examined from a historical perspective, as they apply to current events, and as they affect business decisions.

282 Microeconomics I Fall. 3 credits. Required.  
An analytical look at the basis of production and consumption behavior, market structures, the pricing system, resource allocations, market failures, and public policies directed toward these failures.

284 Tourism I Fall. 3 credits. Also open to students outside the School of Hotel Administration. Not open to freshmen. Hotel elective.  
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.

285 Hotel Sales Fall. 3 credits. Limited to 30 students. Hotel elective.  
A seminar in effective sales management with emphasis on convention and group sales. Topics to be covered include sales organization, market determination, selective selling, pricing, internal conflicts, and convention servicing.

382 Cases in Hospitality Marketing Fall or spring. 2 credits. Prerequisite: H Adm 283 or 781. Hotel elective. Not offered 1985–86.  
This course, taught as a seminar, will utilize cases and attendant readings to help develop abilities in analysis and decision making in hospitality marketing. Topics will include hotels, restaurant, and other service marketing areas—chain and independent.

383 Seminar in Selected Topics in Hospitality Marketing Fall or spring, 7 weeks only. 3 credits. Limited to 30 students. Prerequisites: H Adm 284 or 781 or written permission of instructor. Hotel elective.  
Hours to be arranged. Faculty.  
An advanced course covering all facets of quality assurance (QA) in service businesses, ranging from the strategic issues involving QA to hands-on application of the techniques of error identification, analysis, and elimination. Implementation of a QA program will be emphasized throughout the course. Text, readings, case studies.

384 Principles of Marketing Fall. 3 credits. Required.  
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. At the completion of the course it is expected that the student will (1) know the terminology of marketing as it applies to the hospitality industry, (2) be able to write and explain a simple consumer decision process model, (3) be able to explain how a market of interest is translated into marketing strategy, and (4) be able to analyze a market of interest and develop a suitable marketing strategy to include the appropriate marketing mix.

484 Tourism II Spring. 3 credits. Limited to juniors, seniors, and graduate students. Prerequisites: H Adm 281, 282, 284, and 384, or equivalents, or written permission of instructor. Hotel elective.  
An advanced course in the study of tourism. Emphasis will be placed on the development of the tourism industrial base and development and financing of superstructure and infrastructure. Econometric model development for demand predictions will be examined and analyzed. Students will be expected to engage in a wide range of discussion and analysis of the effects of tourism on various environments in social and economic terms. Case studies of various tourism-generating areas will be used. A series of guest lectures will be given by experts in both public and private sectors.

489 International Marketing in the Hospitality Industry Fall. 3 credits. Prerequisites: H Adm 281 and 282. Hotel elective.  
T R 1–2: W. H. Kaven.  
This course will develop students' understanding of international marketing, with an emphasis on hospitality-industry applications. It will focus on (1) the similarities and differences that exist between domestic and international marketing and (2) the conduct of international marketing in various segments of the world.

699.1 Marketing Communications Strategy Spring. 3 credits. Limited to juniors, seniors, and graduate students. Prerequisite: a previous marketing course. Hotel elective.  
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 of effectiveness; 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.

699.3 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.  
Lec, W 6:30–9 p.m. C. W. Hart.  
A survey course that will provide students with understanding of the nature and uses of marketing research; research methodology; the marketing research process; and analysis 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.

781 Marketing Management Spring. 3 credits. Required M.P.S. course.  
T R 1–2:15. L. M. Renaghan.  
The management of the marketing function in firms operating in the hospitality industry. The emphasis is on developing the student's organizational, analytical, and decision-making capabilities through involvement in case experiences and project presentations. No prior marketing knowledge is assumed.

782 Strategic Market Planning in the Hospitality Industry Fall [or spring]. 3 credits. Hotel elective. Not offered spring or fall 1986. W 6:30–9 p.m. C. W. Hart.  
The application of strategic market planning concepts to firms involved in various aspects of the hospitality industry. Topics include the concept of corporate mission, utilizing marketing concepts to establish corporate goals and objectives, techniques of analyzing businesses, turnaround management, and strategy formulation and implementation. These topics will be covered through the use of articles, readings, lectures, outside speakers, and case studies.

Independent Research Courses

600–680 Undergraduate Independent Research  
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. Additional directed study, if taken, is applied toward free electives, except for the management-intern 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.  
Students pursue independent research projects under the direction of a faculty member.

600 Administrative and General Management  

601 Management Intern Program I—Operations  
Fall. 3 credits.  

602 Management Intern Program II—Academic  
Spring. 3 credits.

610 Human-Resources Management  

620 Accounting and Financial Management  

630 Food and Beverage Management  

640 Law  

650 Properties Management  

660 Communication  

670 Science and Technology  

680 Economics, Marketing, and Tourism  

700–900 Graduate Independent Research  
Fall or spring. Variable credit. Limited to graduate students. Prerequisite: written permission of instructor.  
Students should obtain permission form from the school's graduate office.

As appropriate, graduate students enroll in this course for thesis or monograph research or for other independent directed study. The student must have in mind a project and obtain agreement from an individual faculty member to oversee and direct the study.

700 Administrative and General Management  

710 Human-Resources Management  

720 Accounting and Financial Management  

730 Food and Beverage Management  

740 Law  

750 Properties Management  

760 Communication  

770 Science and Technology  

780 Economics, Marketing, and Tourism
306 Hotel Administration

800 Monograph I
801 Monograph II
802 Master of Science Thesis Research
803 Graduate Teaching Internship
900 Doctoral Thesis Research

Faculty Roster

Professorial
Arbel, Avner, Ph.D., New York U. Prof.
Berger, Florence, Ph.D., Cornell U. Asst. Prof.
Chase, Robert M., M.B.A., Cornell U. Prof.
Clark, John J., Jr., Ph.D., Cornell U. E. M. Statler Prof. and dean
Dermody, Donal A., M.S., Cornell U. Prof.
Dunn, David C., Ph.D., Cornell U. Assoc. Prof. and asst. dean
Eybler, James J., Ph.D., Cornell U. Prof.
Ferguson, Dennis H., Ph.D., Cornell U. Asst. Prof.
Gaurnier, Paul L., M.S., Cornell U. Prof.
Geller, A. Neal, Ph.D., Syracuse U. Assoc. Prof.
Hart, Christopher W. L., Ph.D., Cornell U. Asst. Prof.
Herman, Francone, M.S., Cornell U. Assoc. Prof.
Kavan, William H., Ph.D., Cornell U. Prof.
Kelly, Thomas J., M.S., Cornell U. Asst. Prof.
Knight, John B., Ed.D., U. of Massachusetts. Assoc. Prof.
Mukowski, Stephen A., Ph.D., Cornell U. Assoc. Prof.
Penner, Richard H., M.S., Cornell U. Assoc. Prof.
Rainsford, Peter, Ph.D., Cornell U. Assoc. Prof.
Redlin, Michael H., Ph.D., Cornell U. Assoc. Prof.
Renaghan, Leo M., Ph.D., Pennsylvania State U. Assoc. Prof.
Tabacchi, Mary H., Ph.D., Purdue U. Assoc. Prof.

Adjunct, Visiting, and Other Teaching Staff
Badaraco, Claire M., Ph.D., Lecturer
Bamford, Carl, A.O.S., Teaching Support Specialist
Compton, Richard A., M.S., Senior Lecturer
D’Aprix, David, B.A., Lecturer
David, Betty B., Lecturer
Degnan, Melissa, A.O.S., Teaching Support Specialist
Flash, Dora G., A.B., Senior Lecturer
Lumley, Jane, M.A., Senior Lecturer
McNeil, Keith, B.S., Lecturer
Macomber, Dean M., M.S., Visiting Lecturer
Morano, Richard A., D.Ed., Visiting Lecturer
Neuhau, 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, LL.B., Visiting Assoc. Prof.
Petzing, James E., B.S., Visiting Lecturer
Pezzotti, Giuseppe G. B., B.S., Teaching Support Specialist
Richard, Bonnie S., M.S., Lecturer
Sciarrabba, Andrew, B.B.A., Visiting Lecturer
Sharp, Linda, M.A., Lecturer
Sher, David, M.S., Visiting Assoc. Prof.
Spies, Rupert, M.Ed., Teaching Support Specialist
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; assistant 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
Dwight Giles, acting director, Field Study Office
Lynne M. Wiley, director, career planning and
placement
Barbara Morse, acting director, Counseling Office

Facilities
The College of Human Ecology 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 historic 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
spectroscopy, chromatography, radioisotope analysis,
electrophoresis, microscopy, and ultracentrifugation;
physical testing equipment such as an Instron; and
cameras, videotape, and sound-recording equipment.

The Students
The College of Human Ecology undergraduate
enrollment is 1,190, with 53 percent in the upper
division. About 320 students are graduated each year,
and approximately 250 freshmen and 100 transfer
students matriculate. One hundred faculty members
serve as advisers for undergraduates. About 500
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
fifty master's degrees and thirty 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 1984
were 575 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 or 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 Selters, 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 school 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 formal admission as a transfer or plan to terminate
studies in the college at the end of the semester.

Special students are expected to take a minimum of 12
credits each semester and to take one-half to two-thirds
of their work in the state divisions of the University. Work
taken while a person is classified as a special student
may be counted toward the requirements of the
bachelor's degree.

Empire State Students
Occasionally a student who is completing requirements
for a degree through the Empire State College Program
is interested in taking a human ecology course. This
may be done by registering through the Division of
Summer Session, Extramural Study, and Related
Programs, B12 Ives Hall. All rules of the extramural
division apply, and registrations will be accepted only
on a space-available basis and with the written
approval of the course instructor.

At the time of registration, Empire State College
students provide the extramural division with a
completed copy of the Empire State College
Notification of Cross-Registration form number
SA-22, F-031, to verify enrollment in Empire State
College. Such students will be charged 25 percent of
the standard extramural tuition per credit.

Degree Programs

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<td>Design and Environmental Analysis</td>
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Options

Two options are offered to undergraduate majors 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.

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
interests 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
are available to discuss coursework, requirements,
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 need to work closely with a college
counselor who is available for planning and referral to
department resource faculty.

Consumer Economics and Housing

Increasing concern with the welfare of the consumer in
society is evident at all levels of government and in
private industry. The Department of Consumer
Economics and Housing (CEH) offers students an
opportunity to focus on social and economic policies
affecting individuals and families. The program
encourages an understanding of economics and
society, particularly as they relate to the consumption
of both privately and publicly supplied goods and
services. Students who complete their undergraduate
work in this department are well prepared for a variety
of positions within a developing field of consumer-
related work in business, banking, real estate, and
public and consumer relations.

The CEH major is flexible and allows individual program
planning. All students majoring in consumer economics
and housing are assigned a faculty adviser by the
advising coordinator. The advising coordinator helps a
student decide to major in the department, the greater the
opportunity to develop a program that will meet individual
educational or career goals. Transfer students are urged to
discuss their plans with a faculty adviser as soon as possible.

An appointment to talk with either an adviser or the
advising coordinator, Ramona Heck, may be made
directly with the faculty member.
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. This knowledge is important to local governments in designing and implementing housing policies that are scrutinized. Careful analysis and evaluation of housing research are stressed.

Design and Environmental Analysis

The Department of Design and Environmental Analysis (DEA) is concerned with creating, selecting, and managing the quality of our near environment. The program of the department emphasizes the interaction between environments and people: the needs of individual groups, and other aspects of the environment that are affected by objects, materials, and surroundings. Students are introduced to the social and physical sciences and other related areas of study. They become familiar with the social, physical, and functional aspects of our environment.

The programs of the Department of Human Ecology (HDFS) are designed to provide students with opportunities to learn about and participate in expanding human-environment relations and the impact of human behavior on the physical environment.

All DEA majors are assigned a faculty adviser during their first two years, and are given the opportunity to complete the degree in four years. It is advisable to select an option as early as possible, as many courses are required for graduation.

Department Academic Policy

Ownership of Student Work

All drawings, models, paintings, graphic art, sculpture, and apparel design work done in the studio or laboratory under the direction of faculty members are the property of the university. These works are considered to be student property and are subject to the rights of the university. The university reserves the right to use these works for educational purposes. The university also reserves the right to use these works for educational purposes.

Exhibitions of Student Work

Exhibitions of student work will be held each semester as part of the yearly DEA Gallery schedule. These may display the work of a specific course or exhibit examples of the best recent work done. The department is not responsible for loss or theft of student work.

Options

The department offers undergraduate education in five professional options: interior design, apparel design, textiles, apparel and textile management, and human-environment relations.

To take full advantage of the course sequences, it is important to select an option as early as possible. This is particularly true in the design options and in the apparel management option, which specify more credits in the major fields than the other two options. Students transfer in the two design options or the textiles option may need one or two extra semesters to complete the program.

Option I: Interior Design

This option prepares students for professional careers in the planning and design of interior spaces and associated products. The program emphasizes a problem-solving approach based upon knowledge of buildings and their associated systems, furnishings, and interior products, human-environment relations, and design principles. Some students combine this program with option V.

Careers are available in interior design and space planning, interior architecture, facility planning, and housing. This program also serves as an excellent preparation for graduate study in interior design, facility management, and architecture.

Option II: Apparel Design

The option in apparel design focuses on both fashion and functional considerations in the design of body coverings. The program emphasizes a problem-solving approach that enables the student to integrate knowledge of design, human-environment relations, and textiles in the apparel design process. Some students combine this option with option III.

The program also prepares students for graduate study in apparel design and textiles and clothing.

Graduates have found challenging employment in the textile and apparel industries, in independent and government-sponsored research projects, and in community organizations.

Option III: Textiles

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 option provides a strong base in mathematics and the physical sciences combined with supporting courses in engineering, the natural sciences, and the social sciences. The program provides excellent preparation for graduate study in many fields, including fiber and polymer science, textile science, textile technology, and textile engineering.

Careers are available in the fiber and textile industries, government, and education. Recent graduates are active in new product development and evaluation, research, technical services, product safety, and consumer information.

Option IV: Apparel and Textile Management

The fields of textiles and apparel, or textiles and interior furnishings, are combined with those of business management and organizational policy. Students learn to apply theoretical and scientific information to find practical solutions by using a problem-solving approach. Courses are drawn from many related disciplines and include textile science, business management, human development, economics, and experience in the industry. Students learn to work effectively with professionals from a wide variety of disciplines, including textile science, design, manufacturing, state and federal regulatory agencies, and retailing.

Option V: Human-Environment Relations

Human-environment relations focuses on the interaction between people and their physical surroundings. There are two directions within this option that students may choose to pursue: (1) applied research and (2) facility planning and management. Both concentrations seek to expand our understanding of how the environment affects human perception, cognition, motivation, performance, health, safety, and social behavior. How human capabilities or characteristics such as family structure, life-style, social class, and stage in life cycle affect environmental needs and requirements is also a focus of the program.

The applied research concentration is good preparation for graduate study leading to a Ph.D. in the social sciences and a career in academic or other research-oriented settings in both the public and private sectors. It can also serve as the basis for graduate study in an environmental planning or design discipline such as architecture, landscape architecture, or city and regional planning. Electives in the social sciences and in research methods and statistics are appropriate.

The facility planning and management concentration has a more immediate career focus. While a master's or Ph.D. degree will increase a student's career options, a major in human-environment relations with a concentration in facility planning and management can open significant career opportunities immediately upon graduation, particularly in the private sector. Electives that focus on business, management, and facility planning and management are appropriate for this concentration. In all cases, courses should be selected in consultation with the faculty adviser and the student guide.

Human Development and Family Studies

The programs of the Department of Human Development and Family Studies (HDFS) are concerned with how people develop throughout the life cycle. They are interested in the family as a context for development and the ways in which the development of individuals is affected by the space, objects, and materials around them. The Department of Human Development and Family Studies (HDFS) is interested in the family as a context for development and the ways in which the development of individuals is affected by the space, objects, and materials around them.

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 development, family 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
Human Service Studies

The curricula in the Department of Human Service Studies (HSS) prepare students for professional careers in human services. Graduates of the department are prepared for a variety of professions, including home economics teaching, social work, human service planning and policy development, health, and various community education activities.

HSS graduates work in schools, social agencies, cooperative extension services, and community development agencies that serve children, youth, the elderly, and families. The range of career opportunities depends both on the student's interests and on electives chosen to meet individual career objectives.

HSS is unique in that it integrates a broad spectrum of studies, offered by several departments and colleges, and focuses them for professional practice in human service studies. Offered by several departments and colleges, students interested in the planning and development of human service programs and policies.

Option I: Human Ecology Education

This option prepares participants to plan, implement, teach, and evaluate innovative educational programs in formal and informal learning environments. Students from this option may take positions in cooperative extension; schools, outreach programs (teen-age pregnancy centers, half-way houses, programs for the elderly, consumer and homemaking programs); programs serving the educational, cultural, and economic special needs of all populations; community centers; continuing education centers; and business and government agencies.

Course work combines a liberal education with professional preparation for the role of educator and integrates field-based learning to link theory with practice.

Areas of concentration. Building on the human ecology core taken early in the program, students select an area of concentration that provides in-depth work on a problem area with subject matter that may cut across departments. Areas of concentration are planned with the faculty adviser around the following:

- Personal Development/Health, including health promotion and treatment for individuals and groups
- Child Development
- Early Childhood Education
- Elder Care
- Human Services Administration
- Human Services Planning and Policy Development
- Human Services, Community and Public Policy
- Human Services, Consumer Economics
- Human Services, Human Development
- Human Services, Social Policy
- Human Services, Social Work
- Human Services, Urban Services
- Human Services, Women's Services
- Human Services, Youth Services

Human and family development focuses on the development of the individual from childhood to adulthood within the framework of the family. Course work covers topics on biological, psychological, and social dimensions of human development; role allocations; value systems; interpersonal family relationships; parent education; contemporary family forms; and integration of current issues related to human and family development.

Consumer education and resource management studies problems related to acquiring and using consumer goods in the context of family decision making and ways family members of all ages could function more effectively in an economic society and considers policy decisions related to consumer protection.

Design and the near environment explores the relationships between physical environment and the behavior of individuals and groups. Basic needs, comfort, durability, safety, ease of care in housing, furnishings, textiles, and clothing are studied. Creating an environment for growth also considers personal and family and community space, ways cultural heritages contribute to the choice of housing and manner of dress, and how physical arrangements influence the environment and life-styles at home and at work.

Nutrition/health/mental health focuses on understanding humans in their biological, physical, and psychological environments.

1) Nutrition/health studies nutritional needs accompanying the physiological changes during the life span; problems encountered in providing food; the relationships among food, health, and human development; and sociocultural systems and their significance for program planning in nutrition and health.

2) Health/mental health studies the problems encountered by the developmentally disabled and emotionally disturbed, the effect of these problems on the family, and the position of these persons in American society. Also studied are the physiological-nutritional and the psychological-social contributors to problems incurred by these people, ways of changing the attitude of the public toward such persons, and means of identifying and developing community resources for programs available to these individuals and their families.

Career clusters. In addition, students select one of the following career clusters: child care, extended family, media and computer technology, diverse populations, or teacher certification in home economics. By choosing a career cluster students focus the selection of courses and field learning based on their individual interests. Students are advised to plan early with their faculty adviser for their area of concentration and career cluster. Faculty advisers will help plan work that may include courses from departments other than HSS, tutorials, fieldwork, and research.

Human ecology education students strive to improve the quality of life for individuals, families, and communities by using a wide range of educational processes in carrying out programs focused on families, human development, and decision making.

Students who wish to teach home economics in schools must complete a sequence of courses that lead to a certificate of qualification for teaching kindergarten through twelfth grade in New York State and many other states. This certificate is exchanged for a provisional certificate when the student takes a home economics examination. Permanent certification requires two years of teaching experience and a master's degree. Students who want to qualify for certification in other states or in New York City must complete the special requirements of each. Most can be met by making careful choices of electives.

Internship. Each student spends part of a semester in the senior year (or the preceding summer) in a...
supervised field setting. The student and the faculty adviser plan the internship to fit the student’s specific interests and career goals. An effort is made to provide students with a variety of opportunities, including work with different economic, intellectual, and age groups, in formal and informal settings, and in traditional and innovative programs.

Students often live in the community in which their internships take place. Their work is guided by staff of the local agency, school, or business and is supervised by college faculty. Occasionally, two placements can be arranged to suit student career goals. For students desiring home economics teacher certification, one placement must be in a school setting.

**Option II: Social Work**

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, services, and issues. The social-work program is accredited by the Council on Social Work Education. Students who complete all requirements are eligible to apply for advanced standing in graduate schools of social work or for beginning-level employment as professional social workers.

The social-work curriculum is based on the biological and social sciences, the humanities, and three core courses in the department, HSS 101, HSS 203, and HSS 292.

Introductory courses in social work, HSS 370, Social Welfare as a Social Institution, and HSS 246, Ecological Determinants of Human Behavior, should be taken as prerequisites for HSS 471–472, Social-Work Practice. A grade of C+ or better in HSS 246 and HSS 370 is required to continue in the option. Students who do not achieve these grade levels may change to other options.

HSS 471–472, Social-Work Practice, is a year-long methods course that includes fieldwork. Students are placed with agencies within a fifty-mile radius of Ithaca. Students spend Tuesdays and Thursdays in the field and Mondays and Wednesdays on campus in seminars. A driver’s license is highly desirable. A laboratory fee is charged to cover costs associated with fieldwork. Students must have permission of the instructor to register for HSS 471. Satisfactory work in the field placement and a grade of B— or better is required in HSS 471 for a student to continue with HSS 472. Students who do not achieve a B— or better in HSS 471 may be allowed to take core courses in biology and society, a set of electives, and a special seminar. Course work in the College of Human Ecology must be taken in two of the following three 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.

**Option III: Human Service Planning and Policy Development**

Students in this option

1) obtain an interdisciplinary background in the social, sciences, taking courses in education, sociology, psychology, and government;
2) study existing human service policies, programs, and delivery systems—how they have evolved, how they work, and how they change;
3) become familiar with the history of human service planning and the settings in which planners work, and the nature of planning and policy development as an activity in which analytical and political skills are equally important;
4) acquire and develop analytical tools and skills, including statistics, research design, use of the computer, and methods for assessing needs and resources, choosing among alternatives, designing programs, and evaluating results;
5) acquire and develop social and political skills, including the ability to understand group and organizational behavior and the operation of local, state, federal, and intergovernmental political systems, and to communicate effectively with citizens, professionals, government officials, and others;
6) choose an area of concentration—for example, in health services, social services, education, or housing and the environment—and develop additional specialized knowledge;
7) test their knowledge, explore future job or educational possibilities, and gain practical experience through field study in appropriate agency settings.

The option prepares students for employment as planners in local or regional planning departments, human service planning agencies, and more-specialized planning programs in health, mental health, programs for the aging, criminal justice, and other fields. These students may also gain employment as analysts or program planners in voluntary organizations or direct-service agencies at all levels of government or positions on state or federal legislative staffs.

This option also provides a desirable undergraduate background for graduate education in such fields as urban planning, public administration, health planning, health administration, social work, or law.

**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 management, 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, ecology, ethics, and history. In addition, major courses include core courses in biology and society, a set of electives, and a special seminar. Course work in the College of Human Ecology must be taken in two of the following three 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.

**Interdepartmental Major in Policy Analysis**

A rising out of the increasingly complex interweaving of the public and private sectors of society is an increased demand for people trained to analyze the consequences of public policies, programs, and proposals for individuals and households, businesses, and for particular sectors in society. The increased demand is at all levels of government and in business. Analytical and policy-analysis skills are in demand for people trained to analyze the economic and political forces at work in both the private and public sectors of society with statistical, analytical, and evaluation techniques. The economic and political knowledge and the analytical techniques are built on a broad foundation in 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 core courses in additional specialization.

This option also provides a desirable undergraduate background for graduate education in such fields as urban planning, public administration, health planning, health administration, social work, or law.

**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 within the focus of the college and be interdisciplinary in design, include at least 40 credits in human ecology courses, and not exceed the normal number of credits allowed in the endowed divisions. A student develops an individual curriculum in consultation with faculty advisers from at least two subject-matter fields and the program coordinator.

Such a program of study should encompass a substantial part of the student’s undergraduate education and must include at least three semesters. For this reason, a request to follow an individual curriculum should be made as early as possible and must be made before the second semester of the junior year.

If an individual curriculum seems advisable, Barbara Morse, in the Counseling Office, will provide direction for formulating the study. Although the individual curriculum coordinator must sign the green schedule during course enrollment each term, it is the student’s responsibility to follow the curriculum as planned or have any necessary revisions approved in writing by his or her advisers and the program coordinator in advance of the program change.

**Special Opportunities**

Several special programs allow students to receive academic credit for fieldwork and internship experience, to study in absentia, or to enter particular graduate programs after the junior year.

**Human Ecology 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 Study Office, 159 Martha Van Rensselaer Hall, offers interdepartmental, prefield preparation and field-based courses with an interdisciplinary problem-solving approach to social issues. Field placements are located in the Ithaca area, excellent 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 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 core courses in additional specialization.
New York City, Albany, Washington, D.C., Boston, and elsewhere. Field Study Office courses are open to registration by all Cornell students.

Human Ecology International Program
The International Program provides students with an opportunity to add an international dimension to their human ecology program through course work focusing on international problems and intercultural understanding. There are opportunities for in absentia study abroad at many overseas universities. See A Student's Guide to the College of Human Ecology for procedures for study in absentia. The International Program Office coordinates Denmark's International Study Program at the University of Copenhagen for all Cornell undergraduate students. This program provides the opportunity for a semester or a full academic year in Copenhagen with studies in absentia in the fields of General Studies (Liberal Arts), International Business Studies, or Architecture and Design Studies. Architecture and Design Studies also offers the option of a summer program. Interested students should contact the International Program Office in 153 Martha Van Rensselaer Hall.

University Programs
African Studies and Research Center Courses taken in the African Studies and Research Center (ASRC) may be used to meet some of the distribution requirements of the college. Up to four 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 elective courses.

A list of ASRC courses approved to meet distribution requirements or as electives is available in the Counseling Office 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 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 if the management course work taken in the senior 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.

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 for admission under only one major. 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 Study Office.

Ithaca College Full-time undergraduate students at Cornell may petition to enroll in courses at Ithaca College. 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 Martha Van Rensselaer Hall.

Planning a Program of Study
Majors
Each department offers a major, and within most departmental majors there are specific options. The college also offers two interdepartmental majors. Selecting a major means choosing one option in one department. Although a student may satisfy the requirements of more than one major option, he or she is officially certified to graduate under only one. (The college urges students who satisfy more than one major or option to make note of this in their credentials if they apply for graduate or professional school programs.) Majors include the following options.

Consumer Economics and Housing (CEH): consumer economics, housing.

Design and Environmental Analysis (DEA): interior design, apparel design, textiles, apparel and textile management, human-environment relations.

Human Development and Family Studies (HDFS): does not have specific options. Courses focus on cognitive, personality, and social development; infant and early childhood development; and family studies.

Human Service Studies (HSS): human ecology education, social work, human service planning and policy development.

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.)

Interdepartmental Major in Biology and Society (ID-RS).

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 major no longer seems to meet a student's educational goals, a counselor or faculty adviser may be able to point out alternatives. If the student decides to make a change, a change-of-major form (available from the Office of the College Registrar, 146 Martha Van Rensselaer Hall) ensures that the change is sent to the department in which the student wishes to major, so an adviser can be assigned to the student.

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 minimum requirements of the major. The University is diverse, the departments offer many open 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 College also offers an 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 advantageous if they are 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.

I. Natural and Social Sciences (24 credits)

A. Natural sciences (6 credits) selected from:
- Biological sciences courses must be taken sequentially.

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 110, 116, 117); sociology (including rural sociology, CEH 149, HDFS 150). Students should not take Economics 101 and CEH 110; Economics 102 and CEH 110; or Psychology 101 and Education 110; they are equivalent courses.

C. Additional credits (12 credits) selected from:
- 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:
- communication arts; comparative literature; computer science; drawing; English; ancient or modern foreign languages; history; history of art; history of architecture; mathematics; music; Natural Resources 407; philosophy; statistics (students should not take both ISL 210 and Agricultural Economics 310, since the courses are substantially the same); theatre arts; DEA 101, 111, or 115, HSS 292; and selected ASPC 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 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 these 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 endowed credits allowed.

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 students 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 any 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:

<table>
<thead>
<tr>
<th>Status at Matriculation</th>
<th>Credits to Satisfy Work outside the Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman (1–25 transfer credits)</td>
<td>15</td>
</tr>
<tr>
<td>Sophomore (26–55 transfer credits)</td>
<td>12</td>
</tr>
<tr>
<td>Junior (56–85 transfer credits)</td>
<td>9</td>
</tr>
<tr>
<td>Senior (86–120 transfer credits)</td>
<td>9</td>
</tr>
</tbody>
</table>

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. An average schedule of 15 credits a semester (in addition to physical education) is considered standard, and if pursued for eight semesters will provide the credits needed for
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 counselor, or both, about their program plans. Students must have their course enrollment schedule signed 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 starts.

Since new students starting at midyear do not have an opportunity to enroll in courses until after they arrive on campus, an additional semester is planned 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 preceding the beginning of the term. Course enrollment for continuing students need not be completed by the time the student submits a written request to 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 assigned on the basis of seniority. Exceptions are sometimes granted if requested from the college registrar before the end of course enrollment. Students who fail to meet the deadline for any reason should see the college registrar as soon as possible. In some cases, if the delay was absolutely unavoidable, the student may be allowed to enroll in courses late, and it is sometimes possible to have the fee waived.

University Registration

Students go to Barton Hall for University registration at times announced by the Office of the University Registrar. At registration, students fill out and return materials that are given to them, and their IDs are validated.

After completing University registration, students proceed to the College of Human Ecology table in Barton Hall. At that table they hand in their college registration card and in return receive a computer printout of courses for which they are officially enrolled. It is the student's responsibility to check the listing for accuracy of course numbers, credits, and other data. If there are errors, they should be corrected immediately. Procedures for making changes because of errors in the printout, as well as for other reasons, are described below.

During University registration for the fall semester, each continuing student receives a copy of his or her summary of record from the Office of the College Registrar. The summary shows which graduation and major requirements have been completed. Students who have any questions about the summary's accuracy should see a counselor in the Counseling Office 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 $10 each week for the fourth, fifth, and sixth weeks and 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 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 computer printouts of the courses for which they are officially registered. 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 enrollment changes are still 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 (Withdrawn), and the credit will be removed from the student's Cornell transcript.
• After the third week and through the seventh week of the term, the procedures outlined above for changes made during the first three weeks of the semester are followed, except that the instructor must sign the course-change form before it can be officially registered, and a $10 fee must be paid.
• After the seventh week of classes, a student may not make course changes without petitioning for approval.

Students should realize that they are expected to attend classes and do assigned work until the petition has been formally approved.

Procedures

Students who need to make course enrollment changes should make them as soon as possible. It is to the student’s advantage to enroll in the desired courses as soon as possible, and it is helpful to other students if unwanted courses are dropped promptly.

Students should assess their work loads carefully at the beginning of each term. If in the first week or two the instructor decides 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 as were necessary for course enrollment—for example, permission of the instructor must be obtained. If the student wishes to make changes in the course or in the order of the course, 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 nutritional sciences majors must be signed by the departmental faculty advisor.

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 Counseling Office.

2) Fill in the form 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. Students who fail to register by the seventh week of the term will be withdrawn from the University. Students who want to return to the college must reapply through the Admissions Committee.

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. 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 carbon copies of each optical-mark course-change form at the time it is turned in. These copies are stamped with the date of receipt. It is important to keep the original copy and the carbon 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 must check their status on the waiting lists in person every forty-eight hours, and if space has not opened up, request that their names be kept on the list. Names are automatically dropped if they are not updated.

If a student is enrolled in a human ecology course with a limited enrollment and has not attended the first two class sessions, he or she will be dropped from the course unless circumstances have prevented him or her from attending class and the instructor has been notified.

After the third week and through the seventh week of the term, the procedures outlined above for changes made during the first three weeks of the semester are followed, except that the instructor must sign the course-change form before it can be officially registered, and a $10 fee must be paid.

After the seventh week of classes, a student may not make course enrollment changes without petitioning for approval. Students should realize that they are expected to attend classes and do assigned work until the petition has been formally approved.

Study in Absentia

Under certain conditions, credit toward a Cornell degree may be given for study in absentia, that is, study done at an accredited institution away from Cornell after entering the College of Human Ecology. To be eligible for credit for such study, a student must be in good academic standing and must receive permission in advance from the college registrar. Students not in good standing may study in absentia but will not receive transcript credit until they return to good standing.

In absentia petition forms are available in the Counseling Office. The petition form should be filled out and catalog descriptions attached for the courses the student wants to take, and it should be filed 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 a student’s account in absentia registration. If the in absentia student is undertaking a study program during the summer, the $15 fee is charged only if the summer study is for more than 6 credits. A form is included within the petition 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 program 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. To take more than 15 credits in absentia, a student must also have the petition approved by the college registrar, who will evaluate the proposed program. (Forms are available in the Counseling Office.)

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 filed.

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 the College of Human Ecology. Courses taken from other colleges must 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.

If a student who holds Regents’ or Children of Deceased or Disabled Veterans Scholarship may claim that scholarship for study in absentia if the study is done in a college in New York State and if it is for a maximum of 15 credits acceptable to the College of Human Ecology.

Leaves of Absence

Students may request a leave of absence before the beginning of the semester for which a leave is desired or 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 leave of absence is granted, 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 denied 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 return after the leave has expired, the student will be given a withdrawal after the seventh week of the term in which he or she failed to register.

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 reapply through the Committee on Academic Status for consideration along with all other applicants for admission. If the student was in academic difficulty at the time of the withdrawal, the request for readmission will be referred to the Committee on Academic Status for consideration, and that committee may stipulate criteria under which the student may be readmitted to the college.

**Petition Process**

There are two kinds of petition forms: the General Petition Form, which is multicopied, and the In Absentia Petition Form, which is a single sheet and has no copies attached. Both types of forms are available from the Counseling Office, N-101 Martha Van Rensselaer Hall.

The use of the General Petition Form is described in the human ecology Student Guide. After completing the petition, the student should file the General Petition Form in N-101 Martha Van Rensselaer Hall. He or she will fill out the petition if the student has been granted or denied by checking or his or her mail folder in the folder. The In Absentia Petition Form is used when the student wishes to study at another institution. (See the human ecology Student Guide for regulations concerning in absentia study.) This form is also used for students who wish to take the 15 credits in absentia during their college career. Catalog descriptions of the courses the student wishes to take at the other institution must be attached to the petition form. After checking the course, the student should file the In Absentia Petition Form in 146 Martha Van Rensselaer Hall. A letter in the mail will inform the student of the decision.

It should be noted that although many kinds of requests are petitionable in the college, some kinds of situations are governed by college faculty legislation and cannot be altered by filing a petition. If the student is in doubt about whether a request could be considered by petition, he or she may discuss the problem with the college registrar.

**Grades**

See the "Grading Guidelines" section for information on the official University grading policies.

**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. University 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 (offered for S-U grades only) are permitted to apply 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, then 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 third week of the term. After the third week of the term, students must petition the college registrar to change S-U grading status. Forms are available in the Office of the College Registrar and in the Counseling Office.

**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 the end of the course 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 sheet 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 filling out and signing part of 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 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 INC appears on the student’s official transcript, with an asterisk and the final grade received, for the semester in which the student 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 make sure 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 by grading each semester by placing on the Dean's List the names of students who have completed satisfactorily at least 12 credits other than S or U and who rank in the top 10 percent of their class for the semester. 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 10 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 terms have been given double weightings 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 45 credits at Cornell after filling out 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 Courses**

**General Courses**

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 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.

451–452 America and World Community (also Agriculture and Life Sciences 401–402, and Government 401–402) 451, fall; 452, spring. 3 credits each term.


The aim of this interdisciplinary course is to explore the place of the United States in the world community. The course is based on the assumption that if the goal of humankind is world community, so is the goal of education. And while there are countless urban and
Human Ecology

rural communities, there is only one world community, which needs to be studied in its ecological and geopolitical state in contrast to the normative ideal state that it ought to become. This requires analysis by the humanities, social sciences, natural sciences, and religious studies.

International Program
B. Harding, director

The International Program provides students with an opportunity to add an international dimension to their human ecology program through course work focusing on international problems and intercultural understanding. There are opportunities for in-absentia study abroad at many overseas universities. See A Student's Guide to the College of Human Ecology for procedures for study in absentia. The International Program Office coordinates Denmark's International Study Programs at the University of Copenhagen for all Cornell undergraduate students. This program provides the opportunity for a semester or a full academic year in Copenhagen with studies in absentia in the fields of General Studies (Liberal Arts), International Business Studies, or Architecture and Design Studies. Architecture and Design Studies also offers the option of a summer program. Interested students should contact the International Program Office in 153 Martha Van Rensselaer Hall.

361–362 Study Abroad
Fall and spring. 6–15 credits. Prerequisite: HE 361, satisfactory completion of any necessary foreign language requirement, a grade-point average of 2.5, and permission of academic adviser and assistant dean for undergraduate education. Deadline for receipt of applications in assistant dean’s office: February 15 for following fall semester, October 1 for following spring semester. Students register for their first semester of study under 361 and for a second semester under 362. Not offered 1985–86.

380 Human Ecology: An International Perspective
Fall or spring. 3 credits. Limited to 25 students; intended for junior or senior majors in the natural sciences, the social sciences, and the humanities, and for students whose major field of study includes the study of human ecology and its interactions with the environment. Students register for their first semester of study through discussion, reading, and writing. Academic credit is awarded for this integration of theory and practice. There are opportunities for in absentia study abroad in Copenhagen, Denmark.

400 Directed Readings
For study that predominantly involves library research and independent reading.

401 Empirical Research
For study that predominantly involves data collection 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.

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 assistant dean for educational programs and policy and the member of the staff in charge of the program for independent advanced work. S-U grades optional. Hours to be arranged. Staff.

Interdepartmental Courses
Field Study Office
T. Stanton, director; B. Giles, director of placement; N. Whitlam, director of placement.

100 Orientation to Field Study: Skills for Learning in the Field
Fall or spring. 2 credits. Limited to 15 students per section. Prerequisite: permission of instructor. S-U grades optional. Not offered 1985–86.

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 10:10–10:25 or 2:30–2:45. D. Giles.

407 Field Experience in Community Problem Solving
Fall or spring. 6–15 credits. Limited to 25 students; intended for juniors and seniors. 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.

408 Directed Readings
For study that predominantly involves library research and independent reading.

409 Empirical Research
For study that predominantly involves data collection and analysis.

436 Supervised Fieldwork
Fall, spring, or summer. 3–15 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.

460 Directed Readings
For study that predominantly involves library research and independent reading.

461 Empirical Research
For study that predominantly involves data collection and analysis.

462 Supervised Fieldwork
Fall, spring, or summer. 3–15 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.

463 Teaching Apprenticeship
For study that includes assisting faculty with instruction.

466 Sponsored Field Learning or Internships
Fall or spring. 6–15 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 due in the Field Study Office during the preceding semester's course enrollment period. Hours to be arranged. T. Stanton.

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 public or private organizations or institutions. Field supervision, largely carried out through biweekly correspondence, is aimed at complementing students' work-and-study assignments while they are on their internships and in 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 awarded for the number of hours students arrange to complete activities designated in their internship plans and 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.
additional time completing seminar readings and assignments. The seminar is aimed at assisting students in systematically analyzing the complex factors that affect the success or failure of new programs, policies, or projects in upstate community settings. 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, students are required to review twice during the semester by an oversight committee composed of community and faculty representatives with relevant expertise. Completion of the course is signified by formal presentation of project results to the contracting organization. Students' staff, board of directors, or other appropriate administrative units, and members of the oversight committee, together with submission of an academic analysis of the interdepartmental and departmental sponsorship and supervision.

Credit is variable to allow students to arrange for combined interdepartmental and departmental sponsorship and supervision. Information on projects is available during course enrollment in the Field Study Office, 159 Martha Van Rensselaer Hall. Students may assist in the planning and project-identification process by making their interests known to the office a full semester before intended enrollment in the course.

409 The Ecology of Urban Organizations: New York City
Fall or spring. 15 credits. Limited to 20 students, intended for juniors and seniors. Prerequisite: ID 200 and permission of instructor. Applications due in the Field Study Office during the preceding semester's course enrollment period.
K. Reardon.
A New York City-based fieldwork course aimed at enhancing students' knowledge of how formal organizations function in an urban setting. Students will be exposed to the central theories, concepts, and models of organizational theory while participating as interns in public, nonprofit, and private agencies and firms. Students will be placed in the field to attend a daily seminar each week. Placements are available for students from all majors and include internships in consumer education, housing and real estate, textile design, physical and social planning, facilities management, child welfare, social planning, housing and real estate, textile design, physical and social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare, social planning, facilities management, child welfare.

Topics to be covered in the seminar include goal setting, management, organizational design, informal groups, leadership, power and authority, interorganizational relations, and organizational change. Weekly seminars provide support for students in adjusting to their new activities and environment while exposing students to the major organizational behavior ideas and debates. The course is taught from an ecological and systems perspective, so that students will be exposed to the various intraorganizational and interorganizational factors influencing human behavior in organizations. Seminars feature lectures, discussions, organizational analysis assignments, simulations, speakers, and field trips around the metropolitan area. Students are given practice in using the ecological perspective by engaging in a group research project focusing on a critical issue facing organizations in New York City. They are asked to use their internship experiences, classroom discussions, group research project, and readings to critically reflect upon the major ideas in the field of organizational theory.

Students may enroll in ID 408 for 9 to 15 ID, and for 0 to 6 departmental credits, depending on department regulations. Information on these policies and on placements is available in 159 Martha Van Rensselaer Hall. Students should begin planning at least one full semester before they apply to this course.

409 The Ecology of Organizations in the Upstate Region
Fall or spring. 3-5 credits. Limited to 25 students. Prerequisite: ID 200 and permission of instructor. Applications due in the Field Study Office during the preceding semester's course enrollment period.
Sem. T 1:30-4:25; hours in the field to be arranged. Staff.
A variable-credit, lthaca-area course designed to give students an in-depth understanding of contemporary organizations and the forces that shape and influence them. The course combines participation in a community setting within commuting distance of the Cornell campus with a weekly seminar that provides the skills, concepts, and theories necessary for understanding organizations and the critical issues they face. Students can arrange for combined interdepartmental and departmental 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.

Consumer Economics and Housing Courses

110 Introduction to Consumer Economics I
Fall. 3 credits. S-U grade option. 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 applications to consumers, household economics, and housing. Introduction to the concepts of opportunity cost, consumer demand, production, market failure, and the calculation of present value.

111 Introduction to Consumer Economics II
Spring. 3 credits. S-U grade option. Students who have taken Economics 101 or another introductory microeconomics course should not register for this course.
M W T 11:15. J. Robinson.

This course introduces students to the issues and concepts in microeconomics. The goal of the course is to give students a working knowledge of economic terms, issues, and theories so that they can understand issues as presented in the popular press. Topics covered include national income accounting, Keynesian versus monetarist theories of income determination, the workings of financial markets and institutions, income distribution, and the role of monetary and fiscal policy in dealing with the problems of inflation and unemployment.

148 Sociological Perspectives on Housing
Spring. 3 credits. Enrollment limited to 6 sections of 20 students each. S-U grades optional.
Lecs, T 10:10-10:30, MWF 9:05 or 2:30; (2) T 11:15, W 10:10 or 2:30; A. Stibbe.
An introductory sociology course analyzing the distribution of housing and population within urban areas. Students focus on the link this urban social and spatial structure has to the quality of urban life. Topics include urban ecology, mobility and migration patterns, suburbanization, segregation, urban social stratification, community power, crime, and poverty.

233 Marketing and the Consumer
Spring. 3 credits. Prerequisite: CEH 110 or equivalent. S-U grades optional.
M W F 8:10-9:55. E. S. Maynes.
This course introduces students to marketing—the processes and institutions by which products are conceived, tested, priced, advertised, distributed, and evaluated. Case studies of both domestic and international marketers are used to impart reality to the course. Emphasis is given to the viewpoint of both the seller and the consumer. Students are required to undertake a paper involving a marketing project.

247 Housing and Society
Fall. 3 credits. S-U grades optional.
M W F 11:15. P. Chi.
A survey of contemporary American housing issues as related to the individual, the family, and the community. The course focuses on the current problems of the individual housing consumer, the resulting implications for housing the American population, and governmental actions to alleviate housing problems.

300 Special Studies for Undergraduates
Fall and spring. Credits to be arranged. Hours to be arranged. Special arrangement for course work to establish equivalency for courses not transferred from a previous major or institution. Students prepare a multipage 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.

312 Family Resource Management
Fall or spring. 3 credits. Limited to 35 students; not open to freshmen; preference given to human ecology juniors, seniors, and transfer students. S-U grades optional.
A systems approach identifies and analyzes basic management concepts. The focus is on the use of resources to attain goals and meet demands. The Personalized System of Instruction format permits self-pacing.

315 Personal Financial Management
Fall or spring. 3 credits. Spring: limited to 100 students. Preference given to human ecology students; not open to freshmen. S-U grades optional.
The study of personal financial management at various income levels and during different stages of the family life cycle. Topics include the use of budgets and record keeping in achieving family financial goals, the role of credit and the need for financial counseling, economic risks and available protection, and alternative forms of saving and investment.

325 Economic Organization of the Household
Fall. 3 credits. Prerequisite: CEH 110 or equivalent. S-U grades optional.
M W F 9:05. W. K. Bryant.
Theories and empirical evidence of how households spend their resources are used to investigate the ways households alter the amounts and proportions of time and money spent in various activities, their size, and their form in response to changing economic forces.

332 Consumer Decision Making
Spring. 3 credits. Prerequisite: CEH 110 or permission of instructor.
M W F 2:30-3:45. E. S. Maynes.
This course is designed to help individuals make more-effective choices as consumers. In pursuit of this goal, the course introduces the student to relevant concepts, theories, and research from economics, consumer economics, marketing, and statistics. Topics covered include informationally imperfect markets, assessing consumer information, seeking redress, bargaining, dealing with information, decision-making rules, the concept of the market, and consumerism. Students prepare price-quality maps of local consumer markets. A second part of the course
introduces the student to the concept of consumer sovereignty and assesses the performance of markets as critiqued by economists and consumerists.

341 Fundamentals of Housing Economics
Spring. 3 credits. Prerequisites: CEH 110 or equivalent. S-U grades optional.
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 taxation, 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 600. Prerequisites: CEH 110–111 or equivalent. S-U grades optional.
M W F 9:05. J. Gerner.
The wealth and income positions of American households are defined and described and their economic determinants discussed along with the impacts of tax and expenditure policies and the economics of the political positions for and against such policies.

400–401–402 Special Studies for Undergraduates
Fall and spring. Credits to be arranged. S-U grades optional.
Hours to be arranged. Staff.
For advanced independent study by an individual student or for study on an experimental basis with a group of students in a field of CEH not otherwise provided through course work in the department or elsewhere at the University. Students prepare a multipage description of the study they wish 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. If registration is necessary, students, in consultation with their faculty supervisor, should register for one of the following subdivisions of independent study:

400 Directed Reading
For study that predominately involves library research and independent reading.

401 Empirical Research
For study that predominately 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.

411 Time as a Human Resource
Fall. 3 credits. Prerequisites: one course in microeconomics. 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 market work, household work, and leisure in the context of family choices at different stages of the life cycle. Investigates current research concerning time allocations made by family members to household and market work. Examines use of time as a measure of household activities and production.

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. Not offered 1985–86; next offered 1986–87.
Family decision making is studied from an ecosystem perspective. Special attention is given to how such decisions may affect the quality of family life as well as the larger society.

430 The Economics of Consumer Policy
Fall. 3 credits. Open to juniors, seniors, and graduate students. Prerequisites: CEH 110–111 or permission of instructor.
T R 10–11:25. E. S. Maynes.
Students are acquainted with the basic approaches to consumer policy and perform economic analyses of specific consumer policy issues. Consumer sovereignty, the consumer interest, and consumer representation are all dealt with, along with economic analyses of current and enduring consumer policy proposals and programs.

431 Consumer Behavior
Fall. 3 credits. Open to seniors and graduate students. Prerequisite: CEH 110 or equivalent. Offered alternate years. Not offered 1985–86; next offered 1986–87.
T R 2:25–3:30. (Undergraduate students); R 1:25–2:15 (undergraduates). E. S. Maynes.
This course applies the concepts, models, and research techniques of the behavioral sciences to the explanation and prediction of consumer behavior. The student is exposed to representative theories, models, problems, and research techniques. Special efforts are made to insure that students encounter problems approached from both the market and consumer viewpoints as well as from the perspectives of economics and social psychology.

An examination of the decision-making objectives of sellers in markets where consumers purchase products. The course then addresses the impact on consumers of the implementation of strategies to fulfill seller objectives. The role of consumer agencies as mediators between sellers and consumers is also considered.

441 Mortgage and Consumer Credit Finance
Spring. 3 credits. Prerequisites: CEH 110 or equivalent.
This course examines the residential mortgage and consumer credit financing processes, alternative credit instruments, and sources of credit. The differences between the financing mechanisms of the various debt instruments will be emphasized, and their effects on consumer decision making will be studied. The microlevel investment aspects of real estate will be explored in its relationship to the cost of financing. Issues of delinquency and financial insolvency will be examined with respect to mortgage and consumer credit debt. The financing process will be examined at the microlevel from the perspective of both the institution and the consumer. Finally, the role of credit in the economic health and the influence of government policy on the supply of credit will be discussed in relation to the credit decisions of the consumer.

443 Social Aspects of Housing and Neighborhood
Fall. 3 credits. Prerequisite: CEH 247 or 148. S-U grades optional.
The relationship between the 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 composition of neighborhoods; the congruency between local housing and population composition, patterns of interaction, and the physical dimensions of community; housing as an expression of the chronology 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. Prerequisite: CEH 247 or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985–86; next offered 1986–87.
T R 2:30–3:45. P. Chi.
This course focuses on the housing needs of the elderly, their current housing conditions—living arrangements, tenure patterns, housing quality and housing expenses—burdens—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.

448 Housing and Local Government
Spring. 3 credits. Prerequisite: CEH 110 or equivalent. S-U grades optional. Offered alternate years.
Analysis of state and local government tax, expenditure, and regulatory policies that affect the housing market. Detailed consideration will be given to property taxation, provision of local public goods, zoning, and other governmental policies that deal with housing and the neighborhood environment.

449 Housing Problems and Policies
This course critically examines the rationales, development, and economic effects of a wide variety of housing-related programs. The use of housing programs as a tool of income redistribution, the role of government in correcting market imperfections in the production and finance of housing, and the role of the housing sector in macroeconomic stabilization will be discussed. Other topics include public housing, cash-based housing programs, tax treatment of housing, the problems of the thrift industry, and the government role in the secondary-mortgage market.

450 Economics of Health, Health-Care Expenditures, and Health Policy
Spring. 3 credits. Prerequisite: CEH 110 or equivalent.
This course critically examines the rationales, development, and economic effects of a wide variety of health-related programs. 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 accessability.

465 Economics of Consumer Law
Spring. 3 credits. Prerequisite: CEH 110 or equivalent. S-U grades optional.
Economic analysis of the roles played both by the courts and by federal and state regulatory legislation in altering consumer markets, consumer behavior, and consumer welfare. Includes a study of the role of economic analyses of contract law, products liability, and accident law, as well as of the activities of such agencies as the Federal Trade Commission, the Food and Drug Administration, and the Consumer Product Safety Commission.
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 field are included.

621 Explorations in Consumer Economics

Spring. 3 credits. Prerequisite: permission of instructor. S-U grades optional. Not offered 1985–86.

Hours to be arranged. Staff.

With the guidance of the instructor, students select and investigate independently a substantive current consumer issue or topic. Students selected must be one that can be studied within both an economic and an institutional framework. Students present status reports to the class regularly for criticism and feedback. A term paper is required.

626 Economics of Household Behavior I

Fall. 3 credits. Prerequisite: Economics 311 or concurrent enrollment in Economics 311. S-U grades optional.

MWF 10:10 J. Gerner.

Introduction at the graduate level to theory and empirical research on household demand, consumption and production, labor market work, with implications for current policy issues. Provides introduction to more advanced treatment of market work, household production, and economics of the family presented in CEH 627.

627 Economics of Household Behavior II

Spring. 3 credits. Prerequisites: Economics 311 and CEH 626. S-U grades optional.

MWF 10:10 K. Bryant.

Further examination of theoretical and empirical literature concerning market work, human capital formation, household production, and family formation, as well as decision-making in household investment projects, housing programs, and government regulations.

628 Information and Regulation

Fall. 3 credits. Prerequisite: CEH 626 or 627. Offered alternate years.


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 housing programs, and the social and economic effects of housing regulations.

629 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.

612 History and Development of Home-Family Management

Fall or spring. 3 credits. Prerequisites: graduate standing and some background in home or family management. Recommended: a course in family sociology. Offered alternate years.

T R 8:30–9:55 A. Davy.

History and development of home-family management as an area of study. Conceptual frameworks currently in use are analyzed and critiqued.

614 Readings in Family Decision Making

Fall or spring. 2–3 credits. Recommended: a course in family sociology. S-U grades only.

Hours to be arranged. A. Davy.

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.

615 Family Financial Management


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 field are included.

665 Seminar on Consumer Law Problems

Spring. 3 credits. Enrollment limited to 20 students. Open to CEH graduate students and to others with permission of instructor. S-U grades optional. Not offered 1985–86.

Hours to be arranged. Staff.

A study of areas of current interest to consumers involving the law as developed by regulatory agencies and the courts, with emphasis on the institutional and economic background. Encourages critical examination of policy issues and their social and economic effects on families.

670 Community, Housing, and Local Political Processes

Spring. 3 credits. S-U grades optional. Offered alternate years.

T 1:25–4:25 A. Shlay.

Explores the sources of American political stability by concentrating on the ways in which political power and participation are managed within the public policy arena. The first part of the course focuses on competing theories of political stability and participation. The second part focuses on political processes and modes of political action. The third part examines power structuring, focusing on the empirical work that looks at the link between the activity of power wielding and class structure.

671 Power, Participation, and Public Policy


T 1:25–4:25 A. Shlay.

Explores the sources of American political stability by concentrating on the ways in which political power and participation are managed within the public policy arena. The first part of the course focuses on competing theories of political stability and participation. The second part focuses on political processes and modes of political action. The third part examines power structuring, focusing on the empirical work that looks at the link between the activity of power wielding and class structure.

680 Applied Welfare Economics—Policy Issues

Spring. 3 credits. Prerequisite: permission of instructor. S-U grades optional. Offered alternate years.

Hours to be arranged. S. Clenchout.

Topics vary from year to year. The objective of the course is to evaluate the economic impact of various policies in conjunction with the efficiency of existing institutions. Policy issues covered include education (effects of automation and so forth), health, and environmental problems (urban development or transportation, for example). Attention is given to the interrelationship of policy and planning within the larger economic and sociopolitical framework.

697 Seminar

Fall and spring. No credit.

M 3:30–5:30 Staff.

Planned to orient students to graduate work in the field, to keep students and faculty abreast of new developments and research findings, to acquaint them with topics in related areas, and to examine and discuss problems of the field.
Design and Environmental Analysis Courses

W R. Sims, chairman; S K. Obendorf, graduate faculty representative; A Racine, undergraduate advising coordinator; G Atkin, F D. Becker, R Beckman, M Boyd, A Bushnell, C C. Chu, S Danko, P Eshtelman, C E. Garner, S Hester, J LaQuatra, M. Boyd, A. Bushnell, C. C. Chu, S. Danko, M. White, B. Ziegert

101 Design I: Fundamentals Fall or spring. 3 credits. Each section limited to 18 students. Priority given to DEA majors. Approximate cost of materials, $60.

102 Design II: Fundamentals Spring. 3 credits. Each section limited to 18 students. Priority given to interior design majors. Prerequisite: DEA 101. Approximate cost of materials, $50; shop fee, $10.

111 Introduction to Design Spring. 3 credits. M W F 11:15. R. Beckman.

115 Drawing Fall or spring. 3 credits. Each section limited to 18 students. Priority given to DEA majors. Minimum cost of materials, $120; diazo machine fee, $8.

135 Introduction to Textiles Fall. 3 credits. Each lab limited to 20 students. Prerequisite or corequisite: Chemistry 103 or 207. Maximum cost of supplies and textbook, $30; lab fee, $40.

145 Apparel Design I Spring. 4 credits. Basic sewing skills. Limited to 18 students, priority given to apparel and textile students. Recommended: DEA 101 and 239 and a drawing course. Minimum cost of materials, $60; lab fee, $5.

150 Introduction to Human-Environment Relations Fall. 3 credits. M W F 12–1:10. F. Becker, E. Ostrander, B. Sims.

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 class, family structures, and handicaps; person-environment fit for lighting, acoustics, and thermal comfort; introduction to human factors and systems analysis; affects 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 239 is required. Recommended: DEA 111 and 150. Minimum cost of materials, $200; shop fee, $10; optional field trip, approximately $60; diazo machine fee, $8.

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 204. Minimum cost of materials, $320; diazo machine fee, $8.

Second interior design studio. Emphasis of the course 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.

230 Science for Consumers Fall. 3 credits. Limited to 20 students. Prerequisite: high school or college chemistry or physics. S-U grades optional. Offered alternate years.

260 Human Ecology Fall. 3 credits. prerequisite: intermediate economics, CEH 626 and 627, or permission of instructor. S-U grades optional. Offered alternate years.


[727 Human Capital Spring. 3 credits. Prerequisite: permission of instructor. Recommended but not required: CEH 411. S-U grades optional. Offered alternate years. Not offered 1985–86; next offered 1986–87. Hours to be arranged. J. G. 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.]

[740 Seminar in Current Housing Issues Spring. 1–3 credits. Prerequisite: permission of instructor. S-U grades optional. Not offered 1985–86. F W 11:15–12:45. A. Racine. Focuses on a selected group of national issues related to housing. The issues evaluated vary from year to year, on the basis of current importance and student interest. Whether this course is presented present or recent research, with emphasis on both content and methodology.

742 Housing Economics II Spring. 3 credits. Prerequisite: CEH 642 or permission of instructor. S-U grades optional. T R 8:40–9:55. P. Zorn.

The course starts with a theoretical analysis of the demand for heterogeneous durable goods. The results are applied to the housing market, and the model is expanded to include income and property taxation, methods of financing, and expectations of mobility. An emphasis is placed on the empirical testing of the theoretical models. Additional topics will vary with the interests of the class and the professor.

899 Master's Thesis and Research Fall and spring. Prerequisite: permission of the chairperson of graduate committee and instructor. S-U grades optional.

Graduate faculty.

999 Doctoral Thesis and Research Fall and spring. Prerequisite: permission of the chairperson of graduate committee and instructor. S-U grades optional.

Graduate faculty.
238 Textiles for Interiors and Exteriors Fall. 3 credits. Prerequisite: DEA 135 or permission of instructor. S-U grades optional.

This course reviews developments and trends in textiles for the home and for contract interiors. Consideration is given to end-use requirements, to performance and test method standards and specifications, and to the environments in which these textiles are used. Field trips are arranged when feasible.

239 Introduction to Apparel Fall. 3 credits. Limited to 25 students. Priorly given to apparel and textile students.

TR 2:30-3:50. B. Ziegert, S. Hester. A study of the selection of raw materials and manufacturing processes for producing acceptable mass-produced apparel products. Design and assembly methods that provide the market and consumer with function, quality, and fit are discussed. Historical, economic, and aesthetic forces are also investigated.

242 Apparel Industry: Field Experience Spring-term break. 1 credit. Approximate cost, $300-$350. $50 deposit required before spring semester begins; remainder required by February 15. Checks made out to Cornell University must be given to instructor. 522 Martha Van Rensselaer Hall (telephone: 256-2144). B. Ziegert. A five-day field trip to a major apparel center such as New York City. Cost includes accommodation, museum visits, and two theater tickets. Tours cover fiber, fabric, and design firms; retailers; and promotion and media establishments of the multifaceted apparel and textile industry.

245 Historical Perspectives on Apparel Fall. 3 credits. Enrollment limited to 40 students. Prerequisite: Two Freshman Seminars. S-U grades optional.

TR 10:10-12:05. A. Racine. A historical survey of American dress from the 1700s to the present day and sociocultural, economic, and political forces that affected style changes and women's development. The Cornell Costume Collection, slides, and film clips are used during lectures and discussions. The term paper theme: Impact of dress on cultural assimilation of immigrants.

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 sciences or design. Exercises apply environmental form influences on social behavior such as aggression, cooperation, community, and crime. Also covers 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 251, 252, and 353. M W F 11:15-12:30. G. C. Milican. A study of the patterns of historical development and change as revealed through American furniture and interiors, 1650–1885. Design forms are considered individually, collectively, and in their historical context as they express the efforts, values, and ideals of American civilization.

261 Fundamentals of Interior Design Fall. 3 credits. Enrollment limited to 20 students. Prerequisite: DEA 101. Minimum cost of materials, $30, plus lab fee, $8. TR 1:25–4:25. G. C. Milican. A studio course that emphasizes the fundamental principles of design applied to the planning of residential interiors and coordinated with family and individual needs. Selections are made of materials, space planning, and selection and arrangement of furniture, lighting, and color. Illustrated lectures, readings, and introductory drafting and rendering techniques are presented.

264 Apparel Design II Fall. 4 credits. Prerequisites: DEA 145 and completion of, or concurrent registration in, DEA 101 or 135, or permission of instructor. DEA 116 or a drawing course. Recommended: Art 151, 121, 133, or 141. Apparel design majors should take DEA 264 and 367 in the same academic year. Minimum cost of materials, $80; lab fee, $5. M W 1:25–4:25. B. Ziegert. A studio course that interrelates two techniques for designing apparel. Through exercises and projects, draping and advanced flat pattern making are studied. Problems require the student 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 of design studies to undertake, on a form available from the Counseling Office. The form, signed by both student and advisor, directing the study and the head of the department, is filed at course registration or during the change-of-registration period.

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, $8. TR 10:10–1:10, M 1:25–4:25, or W 3:30–5:25. R. Beckman. 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.


303 Introduction to Furnishings, Materials, and Finishes Fall. 1 credit. W 1:25–3:20. R. Beckman. 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 Fall. 1 credit. W 1:25–3:20. R. Beckman. 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. M W F 10:20. Staff. Implications of human physical and physiological characteristics and limitations on the design of settings, products, and tasks. An introduction to engineering anthropometry, biomechanics, work physiology, and motor performance. Attention is given to the needs of special populations such as the physically handicapped.


331 The Textile and Apparel Industries Fall. 3 credits. Prerequisites: Economics 101 and 102 or CEH 110 and 111 and an upper division course in either apparel or textiles, excluding field experiences. TR 8:30–9:55. S. Hester. A critical review of the textile and apparel industries, including structure and marketing practices, and government policies that affect industry decisions and operations in such areas as energy, safety, and the environment. The role of labor unions is examined as well as the effects of international trade in textile and apparel products.

337 Fabric Technology Spring. 3 credits. Prerequisite: DEA 135. Lecs. M W F 9:05. P. Schwartz. 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.

348 Environmental Graphics and Signing Fall. 3 credits. Prerequisite: DEA 201 or design background or permission of instructor. Limited to 20 students. Priority given to DEA majors. Approximate cost of materials, $25. M W 10:10–1:10. M. Boyd. A studio course dealing with both 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. Enrolment limited to 20 students. Prerequisite: DEA 201 or permission of instructor. Priority given to DEA majors. Approximate cost of materials, $25. M W 10:10–1:10. M. Boyd. The fundamentals of lettering, typography, layout, and presentation 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.
T R 10:10–11:30. Staff.
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. Prerequisite: DEA 101. Corequisite: DEA III. Recommended sequence: DEA 251, 252, and 253.
A historical study of the emergence and development of contemporary design, 1865 to the present. Examines the social, economic, technical, and stylistic forces that shape the design forms of the present and includes a critical analysis of selected works of furniture, fabrics, and interiors.

361 Residential Design
Spring. 3 credits. Prerequisite: DEA 201 or 261, or permission of instructor. Recommended: DEA 135 and 350. 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.

367 Apparel Design III
Spring. 3 credits. Prerequisite: DEA 115, or equivalent, and 264 and Art 121 or 123 or 141, or permission of instructor. Corequisites: DEA 337, Recreation, 117, or 118. Apparel design majors should take DEA 264 and 367 in the same academic year. Minimum cost of materials, $50, lab fee, $15.
Advanced apparel students prepare to challenge and refine their design skills will be presented with a variety of complex studio problems in apparel design. The Cornell Costume Collection is used for illustration and reference. Students may elect up to 4 additional credits to be taken concurrently or in a subsequent semester.

400–401–402 Special Studies for Undergraduates
Fall or spring. Credits to be arranged. S 407 or permission of instructor.
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. Students may elect up to 4 additional credits to be taken concurrently or in a subsequent semester.

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.

431 The Textile and Apparel Industries—Field Experiences
Second week of January intercession. 1 credit. Prerequisite or corequisite: DEA 331. S-U grades only. Offered alternate years. Not offered 1985–86. 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, dyeing and finishing, and designing. In addition, seminars with executives of each participating firm relate theory to current practice.

432 Textile Testing and Evaluation
Fall. 3 credits. Prerequisites: DEA 337 and statistics. Offered alternate years. Lab fee, $50.
This course covers the physical and performance evaluation of textile fabrics. Lectures will cover the theory and philosophy of textile testing methods related to fabric instrumental and visual evaluation procedures for the evaluation 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: DEA 436 and Physics 101, 112, or 207.
Lecs, M W F 9:05, lab, M or W 1:25–4:25. 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.

443 Care of Textiles
Fall. 2 credits. Prerequisite: DEA 337. Not open to students who have taken DEA 230. Not offered 1985–86.
Lec, F 9:05, lab, W 8: M. Purchase.
The interaction of textiles with soils and stains, cleaning agents, and fabrics. 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 techniques used in cleaning, and instructions for care.

450 Textile Chemistry
Fall. 3 or 4 credits. Prerequisites: DEA 135, and Chemistry 253 and 251 or Chemistry 357–358 and 251. Lab fee, $10.
S. K. Obendorf.
A study of polymer structure and organic polymerization reactions of 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.

452 Apparel Textiles
Fall. 3 credits. Prerequisites: DEA 337 and 264, or permission of instructor. S-U grades optional.
Two-day field trips will be arranged when feasible. V. White.
A study of the relationships of aesthetics, fashion and function, and other trade-offs of concern to the consumer. Consideration of the use of standards, specifications, and other means of communication at consumer, government, industry interfaces. Individual or team projects. Seminars and lectures with required readings. Labs include evaluation of apparel.

453 Textile Materials for Biomedical Use
Fall. 2 credits. S-U grades optional for non–DEA majors. Prerequisites: DEA 432 or permission of instructor. T 2:30–4:25. C. C. Chu.
Focusses on chemical and physical 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.

445 Apparel Design IV: Functional Clothing Design
Fall. 3 credits. Prerequisite: DEA 367 or permission of instructor. Lab fee, $5; field trip, $125.
M W F 10:10–11:30. S. Walinsky. Students learn to apply functional design theory to clothing for a wide range of activities and hazardous environments. Protective clothing and equipment for athletes, soldiers, astronauts, scuba divers, fire fighters, backpackers, and physicians are among those items typically covered. Each student executes a final project in his or her own special area of interest.

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 the student's understanding and competency 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-gathering 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. Introduces students to a programming method that emphasizes on the formulation of systems in terms of their characteristics and limitations. Diverse methods are used to determine 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.

465 Apparel Design V
Spring. 3 credits. Prerequisites: minimum of three drawing or art courses and DEA 117 or permission of instructor. Recommended: DEA 117 and 445. Minimum cost, $80; lab fee, $5.
Through studio problems in fashion design, students examine the influence of manufacturing technology and cost on the apparel designer. Liners of garments are developed to various stages from sketches to finished samples.

499 Design VII: Advanced Interior Design
Fall and spring. 1–8 credits. (The first time a student enrolls in DEA 499, it must be for a minimum of 4 credits. Students may elect up to 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 during 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 460 cannot be substituted for 499. Minimum cost of materials, $20; diazo machine fee, $8 per semester.
A comprehensive design problem-solving experience involving the completion of an advanced interior design project selected by the student and approved by the instructor. The course consists of five phases to three weeks each: programming; schematic design and evaluation; design development; final visual presentation; and preparation of a professional-quality design 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.


Study of analytical methods, including electron spectroscopy, scanning and transmission electron microscopy, X-ray analysis, microprobes, X-ray diffraction and stress-strain analysis. Evaluation of the application of these techniques in textile and polymer science.

630 Physical Science in the Home Fall. 2 or 3 credits (3 credits require laboratory attendance). Prerequisite: college chemistry. S-U grades optional. Consult instructor before registering. Lecs, T R 9:05; labs, W 12:20–2:15. M. Purchase.

Applied physical science for professionals working with consumers and home appliances. Energy conservation is considered, and principles from physics are applied to household equipment, and the chemistry of cleaning supplies and cleaning processes is studied.

631 Textiles and Apparel: International Production and Trade Spring. 3 credits. Prerequisites: DEA 331, Econ 361, or permission of instructor. 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 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 term. Hours to be arranged. Staff.

An in-depth study of one or more selected topics in polymers, fibers, fiber comfort, fabric formation, and flammability. The course content will vary; consult instructor for more details.

[636 Advanced Textile Chemistry] Spring. 4 credits. Prerequisite: DEA 436. Not offered 1985–86. The chemistry and physicochemical properties of natural and synthetic rubbers, 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 polymer processing, textiles 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 only. 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] Fall. 3 credits. Prerequisites: DEA 433 or permission of instructor. S-U grades only. Not offered 1985–86. MWF 9:05–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 and their relationship to research data; special topics 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.

640 Adaptive Building Reuse Spring. 5 credits. Limited to 15 students. May not be substituted for DEA 459 or for other requirements for the major by students in the interior design option. Approximate cost of materials, $100; dizzo machine fee, $8. T W R 1:25–4:25. L. Manikowski.

This design course incorporates adapting and reusing existing urban structures. Includes the analysis of existing conditions, market feasibility, and codes and ordinances that impact on the design methodology. Housing will be included in the problem. There will be two required field trips: (1) to visit a site and meet with persons responsible for the project and (2) to visit completed retrofit examples in a major city.

648 Standards and the Quality of Life Spring. 3 credits. Limited to graduate students. Open to advanced undergraduates who have permission of instructor. S-U grades optional. MWF 11:15–V. White.

Studies the dynamic process of developing standards. Provides awareness of what standards are, who makes them, and how they affect individuals, business, industry, and government. Consumer-product standards are considered and both voluntary (such as ISO, ANSI, ASTM) and government regulatory procedures in standards development are reviewed. Case studies include examples for apparel sizing, textile labeling, meat products, solar housing, and safety.


A course intended for the 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 8:30–9:55. F. Becker.

Intended for students interested in the planning, design, and management of complex organizations. The relationship between organizational and individual requirements and physical environment supports and policies is examined through selected readings, lectures, and field experiences.


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 Spring. 4 credits. Prerequisites: DEA 150 or permission of instructor, and a statistics course. Letter grades only. M W 10:10, plus hour to be arranged. E. Ostrandar.

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. 1 credit. For graduate students and advanced undergraduates interested in careers in facility planning and management. S-U grades only. M 4:30–5:45. Staff.

Series of seminars led by Cornell faculty members and other professionals directly involved in the facility planning and management field. Topics include strategic space planning, space standards, office automation, project management, energy conservation, building systems, wire management, and lighting and acoustics.

660 The Environment and Social Behavior Fall. 4 credits. Prerequisite: DEA 150 or permission of instructor. M W 10:00–12:05, 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 faculty.

Human Development and Family Studies Courses


111 Observation Fall. 3 credits. Not open to first-year freshmen.

M W 10:00–P. Schoggen.

An overview of methods of observing people and the settings in which they behave, in order to develop observational skills, increase understanding of behavior and its development, and acquaint students with basic methodological concepts underlying the scientific study of behavioral development. Direct experience in applying observational methods in laboratory and real-life settings is emphasized. Discussion groups accompany the observation experience.


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, interpersonal relationships, social structure, and cultural values in changing behavior and shaping the individual.

150 Families in Modern Society Spring or summer. 3 credits. S-U grades optional.


Contemporary family roles and functions are considered as they appear in United States history, as they change over the life course, and as they are changing in behavior and shaping the individual.
201 Sociological Analysis of Contemporary Issues (also Sociology 201) Fall or spring. 3 credits. Human ecology students must register for HDFS 201. TR 12:20-1:30. R. L. Breger, E. Kain, P. Moen. With its emphasis on the generation of case studies and research reports, this course aids in the development of analytical skills and critical abilities. An introduction to the foundations of sociological analysis is followed by student participation in three other modules. Each module concentrates on one social issue of vital concern while illustrating the distinctive ways in which sociologists define questions, evaluate the answers, and build upon previous research.

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. Staff. 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 psychological significance of pubescence, the nature of adolescence as a phase of the life course, and the impact of schools and education.

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 10–10. Staff. A course giving an overview of basic research and theory on an individual's personality and social development and how they affect biological and cognitive processes during adolescence and youth. Major issues discussed include the relative importance of the family and peers, deviant behavior, and identity.

218 Adulthood and Aging: Personality and Social Development Fall, weeks 1–7; 2 credits. Prerequisite: psychology or sociology course. S-U grades optional. M W F 2–30. S. Cornelius. 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 8–15. 2 credits. Prerequisite: psychology or sociology course. S-U grades optional. M W F 2–30. S. Cornelius. 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, life expectancy, sexual and gender identity, issues in long-term care and institutionalization, and changes in cognitive processes involving sensation, perception, memory, thinking, and intelligence.

242 Participation with Groups of Children in the Early Years Fall or spring. 4 credits (3 credits with permission of instructor). Limited to 20 students. Fall. 3 credits. Prerequisite: HDFS 115 recommended. M W F 11:15-11:35. J. Haas, H. Ricciuti. The aim of this course is to examine the play of children from the fetal period through adolescence, with consideration given to biological and socioenvironmental determinants of growth, as well as to physical and psychological consequences of variations in growth patterns. Normal patterns of growth are examined; an analysis of major sources of variations in growth (normal and atypical) follows.

324 Human Ecology

258 Historical Development of Women as Professionals, 1800–1980 (also Women's Studies 238 and Sociology 238) Fall. 3 credits. S-U grades optional. Human ecology students must register for HDFS 258. TR 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 historical circumstances that created these different work opportunities. The evolution of "gender roles" and the consequences of professionalism for women, family structures, and American society is also discussed.


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 equivalent credit for courses taken from a previous major or institution. Students prepare a multipage 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 coordinator of undergraduate education, is filed at course registration or during the change-of-registration period.

[312 Early Adolescence Fall. 3 credits. Prerequisite: HDFS 216 or 217. Strongly recommended: a course in biology. Not offered 1985–86. T R 12:20-2:20. R. Sawin-Williams. Examines the period of the life course during which the biological changes of pubescence occur. The impact of these changes on individual behavior, interpersonal relations with peers and family, and the individual's position in regard to values and psychological attitudes (normal and atypical) follows.]

[313 Problematic Behavior in Adolescence Spring. 3 credits. Prerequisite: HDFS 216 or 217 and one other course on adolescence. Students interested in adding related field experience should register concurrently for HDFS 402 or 410. Offered alternate years. Not offered 1985–86. M W F 2:30. Staff. Focuses primarily on juvenile delinquency and other problems of adolescence, such as drug abuse, alcohol, pregnancy, suicide, and other social and personal issues.]

[318 From Adolescence to Adulthood: Developmental Issues Fall. 3 credits. Prerequisite: HDFS 216 or 217. S-U grades optional. Offered alternate years. Not offered 1985–86. T R 2–3:45. Staff. Explores effects on the individual and society when those beyond puberty are not granted full adult status or do not assume typical adult roles and responsibilities (for example, young-teen parents, people experimenting with alternative life-styles). Considers both the unique developmental potentials and the stresses of youth associated with questioning of what it means and what it takes to become a full member of adult society. Intimacy, vocational choice, life-style, choice and institutionalization; and political commitment, moral judgment, interpersonal functioning, and education, self-concept, and authority and dependence relations are treated as developmental and stressful issues of this period, and several of these are examined in depth.]

333 Cognitive Processes in Development Fall. 3 credits. Prerequisite: HDFS 115 or equivalent. M W F 11:15–12. G. Suci. A survey of theories and problems in the development of selected cognitive processes: attention, perception, mediation processes, and language. The focus is on the first two years of life.]

338 The Development of Creative Thinking Spring. 3 credits. Prerequisites: HDFS 115, Psychology 101, or Education 110. M W F 10:10–11:10. W. L. Brittain. A study of theories of creativity and a review of the research on creative behavior. Emphasis is on the conditions and antecedents of creative thinking.

342 Models and Settings in Programs for Young Children Fall. 3 credits. Prerequisite: HDFS 115. Not offered 1985–86. T R 12:20–1:35. S. West. Examines the theoretical and philosophical bases and specific implementation of a variety of programs (i.e., Montessori, behavioral, Piaget, Bank Street Model). Students are encouraged to develop their own positions in regard to values and psychological theories. Applications of various approaches to programs for children and families with special needs are also studied.]
348 Advanced Participation in Preschool Settings
Fall or spring. 3 credits. Limited enrollment.
Prerequisites: HDFS 242 and permission of instructor.
Prerequisite or corequisite: HDFS 346.
Two half-days participation (morning or afternoon) and an hour of staff contact each week. Staff.
An advanced, supervised fieldwork experience with a focus on helping children build relationships to support learning and personal development. Students are expected to define their own goals and assess progress with supervising teacher and instructor; to keep a journal; and to plan, carry out, and evaluate activities for children in a variety of curriculum areas.

354 Families in Cross-cultural Perspective
Fall. 3 credits. Prerequisites: HDFS 115 and HDFS 150 or Rural Sociology 100, or equivalent. S-U grades optional.
The sociological study of families from a comparative perspective, looking at similarities and differences across cultures and across ethnic groups. A major focus is the dependence of the family system and social institutions.

358 Theories of Adult Interpersonal Relationships
Fall. 3 credits. Prerequisite: HDFS 150. S-U grades optional.
Select theoretical systems for social psychological, sociological, and psychoanalytic theories and their applications to understanding of adulthood examined. Students generate hypotheses about these theories and test one of them through either a library or empirical paper. A journal is kept to interrelate the concepts and to suggest practical applications.

359 American Families in Historical Perspective
(also Sociology 359 and Women's Studies 357)
Spring. 3 credits. Prerequisites: HDFS 150 or one 200-level social science or history course. S-U grades optional. 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 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 family 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 demonstrate an understanding of 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.
Not offered 1985–86.
Study of relevant theoretical approaches to, and empirical findings regarding, the development of the child's personality. The influence of parents and other environmental factors on the development of personality is examined. Topics covered include attachment, autonomy, identification, moral development, and social behavior.

361 The Development of Social Behavior
Spring. 3 credits. Limited to 100 students. Prerequisite: HDFS 115 or Psychology 128.
Issues in the development of social behavior are viewed from the perspective of theory and research. An attempt is made to apply our understanding of social behavior to education, childbearing, and group behavior. Likely topics include bases of social behavior in early childhood, the role of peers, the development of aggressive behavior, the development and functioning of attitude and value systems, conformity and deviation, and the ethics and limits of experimental research in the study of social development.

365 The Study of Lives
Spring. 3 credits.
Prerequisites: HDFS 115, 216, and 217.
The study of personality development through the analysis of individual life histories. Biological, sociological, and psychodynamic influences are given approximately equal emphasis. There is extensive discussion of the development of motives, decision making, and personal relationships. The term paper is a psychological analysis of a specific individual based on a published biography or autobiography.

371 Behavioral Disorders of Childhood
Fall. 3 credits. Prerequisites: Psychology 101 or Education 110, and a course in personality development (such as HDFS 270 or an equivalent).
M.W.F. 12:00. E. Walker.
Considers the psychological disorders of childhood ranging from transient adjustment reactions to psychoses. The disorders will be studied in view of theories regarding etiology, treatment, and primary prevention.

372 Deviations in Intellectual Development
Spring. 3 credits. Prerequisites: HDFS 115, a course in statistics, and MC 101 or biology.
This course provides an intensive historical examination of abnormal intelligence, focusing on the antecedents of contemporary views of intelligence, brain-behavior linkages, and cognitive malleability.

380 Aging and Health
Fall. 3 credits. Prerequisites: HDFS 218 and 219 and Biological Sciences 100–110 or equivalent.
General introduction to health problems of the elderly and arrangements for dealing with them. The course discusses normal biological changes with advancing age, major age-related diseases, the American health care system, and the use of health services by the elderly. Some attention is given to health care for the elderly in other Western societies and to current policy issues in the United States.

387 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.
T R 10:10-11:40; lab, hours to be arranged. L. C. Lee.
A study of experimental methodology in research with children. Include histories, discussions, and practical experiences covering general experimental design, statistics, and styles and strategies of working with children.

398 Junior Honors Seminar
Spring. 2 credits. Permission of the director of the honors program required for registration. Enrollment limited to students in the honors program.
W 2:30-4:30. P. Schoggen.
Reports and discussion of selected thesis topics by honors students.

400-401-402-403 Special Studies for Undergraduates
Fall or spring. Credits to be arranged. S-U grades optional.
MWF 11:15. S. Hamilton.
For study that involves both responsible participation in a community setting and reflection on that experience designed to culminate in discussion, reading, and writing. Academic credit is awarded for this integration of theory and practice.

401 Teaching Apprenticeship
For study that includes assisting faculty with instruction.

404 Projects in Public Policy (also Government 504, Sociology 505, Psychology 505)
Fall or spring. 4–6 credits. Limited to juniors, seniors, and graduate students who plan to do the required research report.
Prerequisites: HDFS 115, 216, and 217. Fall or spring. 3 credits.
Hours to be arranged. Staff.
An opportunity to study the formulation and implementation of public policy. Types of placement include assignment in a congressional office, in an executive department or agency, with 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 and 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.

410 Field Experience in Adolescent Development: The Individual in Community Settings
Fall. 3–9 credits. Prerequisites: HDFS 216 and 217 and one additional course in adolescent development, a skills-training course or equivalent experience, and permission of instructor. S-U grades optional. Not offered 1985–86.
Plans and practices intended to foster adolescent development are examined in the light of needs identified by theory and research. The key question is how societal and governmental institutions support or hinder the transition of adolescents to adulthood. Current issues such as secondary school reform, youth employment, and teenage pregnancy provide focal points for examining actual and proposed policies and programs.

414 Policies and Programs for Adolescents
Spring. 3 credits. Prerequisites: HDFS 216 and 217, or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985–86.
T R 2:30-4:30. S. Hamilton.
For study that includes assisting faculty with instruction.

418 Work and Human Development
Fall. 3 credits. S-U grades optional.
Prerequisites: background in adolescent and adult development or welfare-related courses, or equivalent. Offered alternate years. Not offered 1985–86. Hours to be arranged. Staff.
Explores the usefulness of developmental theory as a basis for enhancing understanding of the nature and meaning of work for both adolescents and adults. In exploring the workplace as a context for human development, the course addresses itself to problems of vocational training and counseling, of workplace reorganization, and of improving the quality of working life.

431 Learning in Children
Fall. 4 credits. Prerequisite: HDFS 115 or equivalent. T 10:00–12:05; field experience to be individually arranged. M. Potts.
Consideration of the theoretical and research literature, in processes of learning. Includes the interrelations of learning and development, and learning and intelligence. Examines theories and models of learning as well as variables that affect the learning process. Application is made to the assessment of cognitive and social learning through laboratory and fieldwork.

432 Cognitive Development and Education
Spring. 3 credits. Prerequisite: HDFS 115 or equivalent. T 10:00–12:05; field experience to be individually assigned. M. Potts.
This course defines basic cognitive processes that underlie education (for example, linguistic processes that underlie language comprehension and production; numerical processes that underlie mathematics; and perceptual and motor processes involved in reading) and reviews basic and current research on the development and learning of these processes in young children. In addition, the course considers the implications of theories of development for various approaches to education (for example, the relevance of Piagetian developmental theory to standard and alternative education models). A laboratory component focuses on assessment and facilitation of cognitive development as it bears on one educational subject.

434 Piaget's Theory of Cognitive Development
Spring. 3 credits. Prerequisite: Undergraduate and graduate students. Prerequisite: HDFS 115 or equivalent. S-U grades optional. Offered alternate years. Lecs, 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 historical 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, contradictory 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. Recommended: a course in linguistics. S-U grades optional. Offered alternate years. Not offered 1985–86.
T 10:00–12:05. 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. 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 cognition is also discussed.

437 Creative Expression and Growth
Fall. 4 credits. Limited to 25 students. May be added during first week only.
T 10:00–11:30. Saturday mornings should be free to provide time for participation with children. W. L. Eintrian.

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 333 or permission of instructor. T R 2:30–4:25. B. Koslowski.
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 approximate the sorts of reasoning that are described by various models and theories, 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, evaluation, staff 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 the family or in sociology. S-U grades optional. Not offered 1985–86.
T R 10:00–11:30. P. Meen.
An examination of intended and unintended family 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. T R 2:30–4:25. P. Schoggen.
This is a broad course on the topics of basic questions, 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 interaction 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 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. T R 2:30–4:25. U. Bronfenbrenner.
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 disciplinary perspectives (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. 3 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. W 1:25–3:20. U. Bronfenbrenner.
The course presents a systematic examination of existing research on human development throughout the life span 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.

499 Senior Honors Seminar
Fall. 1 credit. Required for, and limited to, seniors in the HDFS honors program. T 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 seminar may optionally 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. Hours to be arranged. Staff.
Critical examination of some seminal theoretical writings on adolescent 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 1:30–4:30. W. L. Brittain, S. Ceci, S. Cornelius, B. Koslowski, 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 Fall. 3 credits. R 10:10–12:35. H. Ricciuti. 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. Lect., M W 9:05–10:20. P. Moen. 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.

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. W 1:25–4:25. E. Walker. Overview of current theories and empirical research on functional and organically based psychological disorders. Topics areas to be covered include autism, schizophrenia, neuroses, and personality disorders. Focus is on developmental 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 interventions 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

700–706 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 their 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.

Human Service Studies Courses


101 (202) Human Services in Contemporary Society Fall. 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, norms, communication, power, and leadership. Students apply what has been learned about small groups to the study of issues in human service organizations (for example, goals, evaluation, structure, technology, relationships between organizations and clients, environment, and change).

246 Ecological Determinants of Behavior Fall. 3 credits. Preference given to HSS Option II students. Prerequisites: introductory sociology and psychology; a human development course, and permission of instructor. M W F 2:30. J. Mueller. Compares conceptual models of human behavior, encouraging the student to incorporate an ecological model into his or her personal-professional framework. Introduces 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 bio-psycho-social functioning of the person-in-situation and valuing human diversity.

280 Racism in American Society Fall. 3 credits. Not offered 1985–86. Hours to be arranged. J. Turner, R. Harris, 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 persistence and prevalence of racial inequality and the relationship of human services to the problems of racism.

292 Research Design and Analysis Fall. 3 credits. M W F 9:05. H. Brown. 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.

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 training in a previous major or
328 Human Ecology

The aim of this course is to provide students with an understanding of the interactions and interrelationships of human behavior that influence sexual development and behavior. There will be a social policy orientation focusing on the evolution of sexual norms, customs, and legislation within changing sociopolitical systems. Biological developmental components of human sexuality will also be addressed. An underlying issue is the influence of our social and cultural development on the development of sexual needs, standards, and values. Research and theory in human sexuality will be explored in an interdisciplinary approach drawing on human and organizational behavior, sociology, history, communication arts, education, research theory, law, sociology, and psychology.

325 Health Care Services and the Consumer
Fall: 3 credits. S-U grades optional. Offered alternate years.

330 Ecology and Epidemiology of Health
Ecological and epidemiological approaches to the problems of achieving human health within the physical, social, and mental environment. The course introduces epidemiological methods to the student and surveys the epidemiology of specific diseases such as AIDS, hepatitis, Legionnaires' disease, plague, cancer, and herpes.

339 Ecological Approach to Instructional Strategies
Fall: 3 credits. Limited to 20 students. Priority given to HSS majors.
TR 12:00–2:15. A. McLennan.
The laboratory course will present theoretical frameworks for observation, analysis, and practice of various teaching behaviors and their effects on learners. Similarities and differences in teaching youths and adults are explored, and the influences of the settings are considered. Students select age, groupings and settings in the community in which to use process skills, teaching, and interaction strategies. To facilitate learning, these are videotaped and critiqued. Observations of schools or community learning activities are arranged.

360 Introduction to Human Service Planning
Fall: 3 credits.
An introduction to human service planning as a field of work. The course will present the history of human service planning, an overview of planning theories or models and their relationships to planning practice, and a survey of human service planning practice in a variety of settings. Major attention will be given to the intermingling of analytical and sociopolitical skills in planning.

370 Social Welfare as a Social Institution
Spring. 3 credits. Prerequisite: HSS 202 or permission of instructor.
M W F 9:05. 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 welfare programs. Basic issues in welfare are discussed in the context of present program designs, public concerns and the interrelationships and support of services in the community.

400–401–402–403 Special Studies for Undergraduates
Fall or Spring. Credits to be arranged. S-U grades optional.
Hours to be arranged. Department faculty.
For independent study by an individual student in advanced work in a field of HSS not otherwise provided in the department or elsewhere at the University, or for study on an experimental basis with a group of students in advanced work not otherwise provided in the department or elsewhere at the University. Students prepare a multipage 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 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, each student should submit a special-studies form to the chairman. 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 readings.

401 Empirical Research
For study that predominantly involves data collection and analysis or laboratory or studio projects.

402 Supervised Fieldwork
For study that predominantly involves both responsible participation in a community or classroom 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
Prerequisite: Students must have taken the course (or equivalent) in the department or elsewhere at the University. Students prepare a multipage 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 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, each student should submit a special-studies form to the chairman. Students, in consultation with their supervisor, should register for one of the following subdivisions of independent study.

414 Practicum
Fall or spring. 6 credits. See A limited to HSS Option I or III majors who have completed the prerequisites planned with their adviser; see B limited to Interdepartmental Option I majors.
Prerequisite: permission of the option adviser and agency field preceptor.
Department faculty.
An opportunity for a student to assume a professional role and responsibilities under the guidance of a preceptor in a community-service organization. Conferences involving the student, field preceptor, and college supervisor are arranged in a block, scheduled throughout the semester, or completed in the summer session, depending on the nature and location of the student’s fieldwork.

416 The Helping Relationship
Fall. 3 credits. Each section limited to 20 students. S-U grades optional. Not offered 1985-86.
A critical analysis of the meaning of help in American society from the perspective of power, alienation, sexism, and racism.

417 The Politics of Power in the Human Services
Spring. 3 credits. Prerequisites: permission of instructor.

421 Social Planning for the Elderly
Spring. 3 credits. Prerequisite: a course in human development, sociology, or psychology. S-U grades optional.
Social policies 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.

439 Program Planning for Educational Programs and Services
Spring. 3 credits.
M W F 9:05. M. Minot.
Students analyze a small-scale project that influence program planning and change and apply principles of program development to plan for and with groups of individuals in programs with different purposes and organizational structures. Plans should address problem areas, issues in the problem area, regulatory and legislative constraints; the philosophy of the specific program or organization and of education; the psychology of learning, interpersonal and intragroup structures and cooperation; human and fiscal resources; and evaluation.

441 Preparation for Internship in Human Ecology Education
Fall, weeks 1–7. 2 credits. Limited to students completing human ecology education requirements. Prerequisites: HSS 339 and 443. To be taken concurrently with HSS 442 and 443. May involve some expense for field visits.
TR 10:10–12:05, plus hours to be arranged during independent study week. E. Conway.
An orientation for the internship in human ecology education. Major topics: internship, and the human ecology education system. Students: finances, costs, costs may or may not be more than on campus, depending on choices made. M. Minot, A. McLennan, E. Conway.
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 whether they are possible or possible to facilitate communication and scheduling.

443 Critical Issues in Education
Fall, weeks 1–7. 3 credits. S-U grades optional. Offered for HSS Option I students. No students are admitted to the class after the first session.
TR 2:30–4:25, 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.

[444 Career Environmental and Individual DevelopmentSpring, weekends 1-7. 2 credits. Limited to 25 students. S-U grades optional. No students are admitted to the class after the first session. Not offered 1985-86. Fall. 12:20-2:15. Staff.]

An analysis of how work, jobs, and careers relate to and shape the behavior of individuals. Topics include theories of occupational choice, job satisfaction, structure of the labor market, career manpower projection, and career planning. The course provides opportunities for students to examine their own vocational aspirations. Emphasis is on how the helping professional deals with clients or students in preparing for, adjusting to, and maintaining jobs and careers.

446 Teaching for Reading Competence: A Content-Area ApproachFall. 2 or 3 credits. S-U grades optional.

M 7:30-9:30 p.m. E. Conway.
The teaching of reading through various content areas. Intended for future educators and community-service professionals as well as those already working in these fields. The course focuses on the need for improvement in reading, evaluation of reading materials, teaching of reading skills basic to various content areas, and development of skills in a setting appropriate for the student. Opportunity to use the materials in a field setting, format or informal, may be arranged if desired. If fieldwork is selected, the cost of transportation to the field setting is to be covered by the student.

452 Advanced Field Experience in Human Ecology Education Spring. 2-6 credits. Course may be repeated with instructor's permission.

Enrollment limited by availability of field placements. Prerequisites vary depending on the field placement; however, one of the following is required: HSS 339, 411, 439, 446, or 471, or Education 311. Permission of instructor required. Because field placements take time to arrange, it is important to contact instructor well in advance of course registration. S-U grades optional. Transportation to field sites must be provided by the student.

W 3:35, plus hours to be arranged for fieldwork. E. Conway.

Direct interaction with individuals, families, or groups in the community. Students will design and implement educational materials for specific organizations, working with cooperative extension programs, working with handicapped students, and working with social service agencies. The seminar assists students in synthesizing and integrating field experience with theory.

460 Human Service Planning Methods Spring. 3 credits. Prerequisite: HSS 292.

M W F 1:25. I. Lazar.
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 synthesize information about the planning and policy development in the human services and that take into account the political and social contexts of the process.

471-472 Social Work Practice I and IIIntroduction to concepts and methods used in a generalist, task-centered model of social work practice. Examination of the values and ethics of professional practice. Microcounseling skills are taught using role playing. Class content is integrated with concurrent supervised fieldwork. Placements are made in social agencies in Fort Knox, Topeka, Cherrum, Cortland, and Schuyler counties. Students are encouraged to provide their own transportation, but car pools 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 work 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.

Lecs, M W T 10:15-12:05. 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.

Lecs, M W T 10:15-12:05. fieldwork, T R for 8 hours each day. C. Shapiro.

473 Senior Seminar in Social Work Spring. 3 credits. Prerequisites: HSS 471-472. (HSS 472 may be taken concurrently.)


Building on the junior-year practice courses, this seminar will integrate intermediate-level theory and practice content and examine recurring themes in professional practice.

474 Program Development in Social Services Fall. 3 credits. Limited to sophomores, juniors, and seniors.

The course will introduce students to program planning and development concepts and processes. The demographic, geographic, economic, and public health components of program development will be discussed. The students will be given specific planning assignments and asked to work in teams.

475 Social Policy Spring. 3 credits. Prerequisites: HSS 370 or Government 111 or Sociology 141. S-U grades optional.

The course is an introduction to the principles and processes at the institutional level. The course is designed to introduce undergraduates to the study of social policy and to provide an introduction to the management process and attempts to develop the students' problem-solving and writing 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.

476 Legal Aspects of Health-Services Delivery Spring. 3 credits.


This course introduces principles of the law that are specifically applicable to health-care delivery. Topics considered include the liability of hospitals and their staff and personnel for injuries to patients, medical records and disclosure of information; consent to medical and surgical procedures; responsibility for patients' property; collection of bills; medical staff privileges; and confidential communications.

486 Medical-Service Issues in Health Administration Spring. 3 credits.

M W 2:30-3:30. V. Utermohlen.

A survey of the issues that affect interactions between the health-care consumer and the medical team, including disease processes (how disease occurs and progresses), the health-care team and illness, third-party payment and illness, and resource allocation.

490 (previously 662) Introduction to Public Health Fall. 4 credits. S-U grades optional. Offered alternate years.


Attention is given to assumptions and concepts that underlie the tools used by public health professionals. 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 work. S-U grades optional.

Department faculty.

622 Health-Services Management Fall. 3 credits.


Designed as an integrating 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 and writing 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 Comparative Health-Care Systems: Canada, the United States, and Third World CountriesFall. 3 credits. Open to all juniors and seniors. Offered alternate years. Not offered 1985-86; next offered 1986-87.


An overview of health services is given within the larger context of the social and economic development policies of Canada, the United States, and Third World countries. Social, cultural, and economic factors are stressed as keys to the formulation of realistic strategies. Resource allocations for health services are assessed against the backdrop of changing rates of economic growth. The relevance of high-technology solutions in developing countries is examined.]
330 Human Ecology

632 Labor Relations in the Health Industry
Spring. 1 credit.
W. Abelow.
This course provides an overview of the major topics and current issues of unionization in the health industry. It examines the unique human aspects and the institutional 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 examples 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 select a field setting administrative and program-planning research skills are given an 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.

650 Teaching Human Services in Higher Education
Fall. 3 credits. S-U grades optional.
M W 11:15. M. Minot.
A review of public policy in education, health, and social welfare services as it pertains to program development. The course includes the history, definitions, and boundaries of the policy process; the relationships of the policy process to political economy, social structure, intergovernmental relations, and cultural values and beliefs; theories of planning and program development in human services; the role of evaluation in program planning and implementation, with special emphasis on monitoring and feedback of effects into the policy and planning process; selected current issues in policy and planning processes, such as regulatory and legislative constraints; the respective roles of clients or consumers and professional planners and providers; and problems and prospects in the coordination among the various human services.

651 Adult Development and the Provision of Human Services
Spring. 3 credits. S-U grades optional.
W 7:30–10:30 p.m.
J. Lazar.
Provides a survey of theories of adult development. Forces affecting the various periods, stages, passages, life tasks, or roles relates to the adult's life cycle are examined. Biological factors, interpersonal relationships, social and cultural influences, and historical events are examined in relationship to perspectives of 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.
The student analyzes the assumptions and concepts that underlie preprofessional and continuing professional education for volunteers, paraprofessionals, and professionals in the human services (for example, adult and continuing education, health, home economics, and social work education). A variety of preservice and in-service programs will be analyzed in terms of goals, means of implementation, and evaluation. Factors that influence programs are examined, including educational setting, licensure, accreditation, legislation, evaluation of performance. Students have the option of participating in educational programs in human service professions and community education. Students may develop or modify a model for providing professional education at the preservice or in-service levels.

653 Consulting and Supervisory Roles in Human Services
Fall. 3 credits. S-U grades optional. Offered alternate years.
Hours to be arranged. Staff.
Analysis of theories and practices of consulting and supervision in high education and in the human services at the national, state, and local levels. Students make observations and apply consulting and supervisory skills in settings related to their professional goals.

654 Administration of Human Service Programs in Higher Education
Spring. 3 credits.
M 1:25–4:25.
Issues that confront administrators of higher education and continuing professional education in the human services are analyzed. Policy in higher education, student selection, program development, program evaluation, accreditation, finance, and professional staff development. Issues are developed by resource persons in higher education.

660 Public Policy and Program Planning in Human Services
Fall. 3 credits.
A review of public policy in education, health, and social welfare services for program development. The course includes the process of formulating program objectives and policies for program planning and implementation, with special emphasis on monitoring and feedback of effects into the policy and planning process; selected current issues in policy and planning processes, such as regulatory and legislative constraints; the respective roles of clients or consumers and professional planners and providers; and problems and prospects in the coordination among the various human services.

661 Designing and Implementing Human Service Programs
Spring. 3 credits. S-U grades optional. Offered alternate years.
Hours to be arranged. I. Lazar.
A review of issues in the translation of research, resources, and policy in education, health, and social welfare services into programs for service to communities and individuals. The course includes issues in need analysis, organizational structure, staffing, budget preparation, fund-raising, and community-academic development, as well as internally based program evaluation, administration, and change in the context of design and implementation.

664 The Intergovernmental System and Human Service Program Planning
Fall. 3 credits.
W 7:30–10:30 p.m.
W. Abelow.
An in-depth review of intergovernmental systems in America and their relevance to the formulation of human service policy and programs. Issues of decision making, fiscal arrangements, and public and private sector intersections are explored as they are affected by intergovernmental relationships. The course provides students with an analytic framework for understanding these and other issues that review the relationships within and between governmental levels.

690 Measurement for Program Evaluation and Research
Fall. 3 credits.
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.
This course strongly recommended.
Introduction to the theory of research design and its application to evaluation of programs. Major topics include experimental, quasi-experimental, cross-sectional, and exploratory research designs; basic sampling theory; and the use of descriptive 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, and model specification.

692–693 Program Evaluation in Theory and Practice
Fall. 3 credits.
Spring. 3 credits.
The critical analysis of research reports, computer simulation, and development of a research proposal.

695 Strategies for Policy and Program Evaluation
Fall. 3 credits.
Prerequisites: HSS 692 and 694 or equivalent. Offered alternate years. Not offered 1985–86; next offered 1986–87.
Hours to be arranged. J. Greens.
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).

Qualitative Methods for Program Evaluation
Fall. 3 credits.
Prerequisites: HSS 690 and 691 or equivalent. Offered alternate years. Not offered 1985–86; next offered 1986–87.
Hours to be arranged. T R 10–11:25. W. Trochim.
A course strongly recommended.

704–705 Internship in Human Service Studies
Fall, spring, or summer. 1–15 credits. S-U grades optional.
Hours to be arranged. Graduate faculty.
Internship placement in human services is determined by availability and students' academic and professional goals. Opportunities are available in public and private human service organizations at the national, state, and...
Local level in positions consistent with student needs and desires. The duration of an internship is negotiated between the student and the agency, while course credit and residence units are arranged between the student and the Special Committee.

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 analysis and appraisal of 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.

669 Seminar in Program Planning and Development Fall. Hours to be arranged. Staff.

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 sunset legislation; 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 has been 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 permission of the instructor.

A series of special-problem seminars, classes, and activities designed for in-service and continuing education of practitioners in helping professions, such as home economics teachers, school 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 policy is 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.

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 684 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.

Nutritional Sciences Courses

See course descriptions in the section on the Division of Nutritional Sciences.

Faculty Roster


Barr, Donald J., Ph.D., Indiana U. Assoc. Prof., Human Service Studies.
Bayer, Helen T., Ph.D., Cornell U. Assoc. Prof., Human Development and Family Studies.
Becker, Franklin D., Ph.D., U. of California at Davis Assoc. Prof., Design and Environmental Analysis.

Biesdorf, Heinz B., Ph.D., U. of Innsbruck (Austria).

Boegly, Carolyn O., M.S., U. of Wisconsin. Assoc. Prof., Consumer Economics and Housing.

Bartfeld, Heinz B., Ph.D., U. of Innsbruck (Austria).

Bayer, Helen T., Ph.D., Cornell U. Assoc. Prof., Human Service Studies.
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Boegly, Carolyn O., M.S., U. of Wisconsin. Assoc. Prof., Consumer Economics and Housing.
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<tr>
<th>Name</th>
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<tr>
<td>McLennan, Claire A., Ph.D.</td>
<td>Texas Tech U. Asst Prof.</td>
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<td>McLean, W. Jean, M.S.</td>
<td>Michigan State U. Prof.</td>
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<td>McClintock, Charles C., Ph.D.</td>
<td>SUNY at Buffalo. Assoc. Prof.</td>
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<td>Hahn, Alan J., Ph.D.</td>
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<td>Greene, Jennifer C., Ph.D.</td>
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<td>Bushnell, Allen R., M.F.A.</td>
<td>Cranbrook Acad. of Art. Assoc. Prof.</td>
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<td>Chi, Peter S., Ph.D.</td>
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<td>Chu, Chih-Chang, Ph.D.</td>
<td>Florida State U. Asst Prof.</td>
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<td>Clemmou, Simone, Ph.D.</td>
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<td>Condry, John C., Ph.D.</td>
<td>U. of California at Los Angeles. Assoc. Prof., Human Development and Family Studies</td>
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<td>Pennsylvania State U. Asst Prof.</td>
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<td>Danko, Sheila, M.D.</td>
<td>Rhode Island School of Design. Asst Prof., Design and Environmental Analysis</td>
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<td>Dor, John M., Ph.D.</td>
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<td>Virginia Polytechnic Institute and State U. Asst Prof., Design and Environmental Analysis</td>
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<td>Kremer, Andre, Ph.D., U.</td>
<td>Groningen (Netherlands). Visiting Assoc. Prof., Design and Environmental Analysis</td>
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<td>U. of California at Davis. Asst Prof., Consumer Economics and Housing</td>
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New York State School of Industrial and Labor Relations

Administration
Robert E. Doherty, dean
Lois S. Gray, associate dean, extension and public service
Jonathan Levy, assistant dean, school relations
James E. McPherson, assistant dean, Office of Student Services
Shirley Harper, librarian
Ronald G. Ehrenberg, director, research
Frances Benson, director, publications
George M. Calvert, 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 and graduate 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 undergraduate 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** studies the history of the labor movement and collective bargaining in the United States, as well as the role of government in labor relations.
- **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 societies.
- **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 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, Albany, 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 Ithaca area and elsewhere in New York State. The ILR program allows juniors and seniors who want to conduct their own research to receive course 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 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-, Macro econometrics | 6 | Fall and spring
Psych 101, Introduction to Psychology* | 3 | Fall
IL&R 100, History of Industrial Relations in the United States | 3 | Fall
IL&R 100, Macro Organizational Behavior and Analysis | 3 | Fall
IL&R 210, Statistics I | 4 | Spring
Any two of the following: | 6 | Spring
IL&R 101, Special Studies in the History of Industrial Relations in the United States
IL&R 140, Development of Economic Institutions
IL&R 121, Micro Organizational Behavior and Analysis
Physical education | 0 | Fall and spring
Sophomore Year
IL&R 201, Labor Relations Law and Legislation | 3 | Fall
IL&R 240, Economics of Wages and Employment | 3 | Fall
IL&R 211 Statistics II | 3 | Fall
IL&R 260, Personnel Management | 3 | Fall or spring
IL&R 200, Collective Bargaining | 3 | Spring
IL&R 250, Accounting | 3 | Spring
IL&R 101 or IL&R 140 or IL&R 121 | 3 | Spring
Junior Year
IL&R 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 IL&R elective courses. No more than 8 of these credits may be satisfied by IL&R 499, Directed Studies, or IL&R 497-498. Internships, or IL&R 495, Honors Program.

Undergraduates are expected to select one course in the humanities and one intensive elective 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 (the College of Architecture, Art, and Planning; the College of Arts and Sciences; the Johnson Graduate School of Management; the College of Engineering; and the 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 may 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 these prohibitions to the courses and conditions:

1) to achieve good standing after being 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 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 elective courses 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 courses.

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 class. 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 completion 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 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, the Scandinavian countries, and the United Kingdom 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 coursework. 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.

C. Daniel, G. Korman, J. Morris, N. Salvatore. 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.

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, G. Korman, J. Morris, N. Salvatore.

Several instructors offer undergraduate classes, each on a particular aspect of the history of industrial relations in the United States. Students choose among classes that may vary from year to year and cover topics such as industrial relations in the age of Jackson and in other periods of American history, such as the Gilded Age, the two World Wars, or the Great Depression; the role of industry and organized labor in politics; and radicalism and dissent in the American labor movement.

200 Collective Bargaining Fall or spring. 3 credits.

J. Burton, D. Cullen, H. Katz, D. Lipsky, P. Ross, R. Seebert.

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 or spring. 3 credits.

T. Crivens, M. Gold, J. Gross, R. Lieberwitz.

A survey of the law governing labor relations. The legal framework in which labor-management 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 employees' 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 101.

G. Brooks.

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 many 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. 4 credits. Limited to upperclass students who have demonstrated 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, G. Korman, J. Morris.

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.

N. Salvatore.

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 activities—and the dramatic changes in industry that Restructured American life during this period.

306 Research Seminar in the American Labor Movement and Policy Fall or spring. 3 credits.

Limited to upperclass students who have demonstrated ability to undertake independent work and who have received permission of the instructor.

J. Morris.

Students choose a research topic, using any disciplinary approach (such as law, history, behavioral or political science), within the subject-matter area. Group meetings are devoted to (1) discussion in depth of special problems such as compulsory membership and union political spending, the adequacy of the law governing union political action; and labor's partisan ties with the Democratic party and (2) exchange of research problems and reports. Some time normally devoted to group meetings is scheduled for individual consultations.

307 Industrial Relations Biographies Fall. 4 credits. Limited to juniors and seniors. Prerequisite: permission of instructor.

J. Morris.

A study of American industrial relations history through the lives of some of the outstanding people who have helped make it—men and women of business, government, and the law, as well as labor and their allies among the intellectuals. While economic forces, institutional developments, and social values are important in shaping history, so also is the role of individual personality. Readings and discussions focus on biographies and autobiographies, supplemented in some cases with tapes and films. There will be written assignments, but emphasis will be on the weekly discussion.

380 Famous Trials in American Labor History Spring. 4 credits. Limited to juniors and seniors. Prerequisite: I&LR 100 and permission of instructor.

J. Morris.

Some of the famous criminal trials involving union leaders, radicals, and ordinary workers who were unknown before they faced the bar. Among the defendants or cases that may be considered (charges range from fraud to murder) are Jimmy Hoffa, Sacco and Vanzetti, Mooney and Billings, the Centralia tragedy and trial, the great WWI trials of World War I, the case of Joe Hill, the Haymarket anarchists, the trial and execution of the Molly Maguire leaders, and the triple case of Moyer, Haywood, and Pettibone.

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. 3 credits.

G. Korman.

This social history of economic affairs and institutions examines the subjects of work and labor from the perspective of American business. Focus is upon corporate capitalists in their capacities as profit seekers, employers of segmented workers, managers of
production and distribution, and citizens of the republic. Special interest includes the study of (1) struggles to make the workplace an arena for, and an instrument of, public affairs, and (2) the place of experts in shaping and executing decisions governing the lives of American workers.

Union Organizing 400
Spring, weeks 1–7.
2 credits.
Each week, 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.

Contract Administration 404
Fall, weeks 1–7.
2 credits. Prerequisites: undergraduates, ILR 200 and 201; graduate students, ILR 500 and 501.
D. Cullen.
This course bridges the gap between ILR 200 (500), Collective Bargaining, and ILR 602, Arbitration. It focuses on various aspects of dispute settlement process prior to final resolution. The intent of the course is to teach students how to work with students rather than to develop personal skills. It includes such topics as (1) the historical development of contractual grievance process, (2) the merits of various alternative processes that have been adopted by the management faculty 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.

History of the Black Worker in the United States 406
Fall. 3 credits. Prerequisite: ILR 100.
J. 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.

Contemporary Trade Union Movement 407
Fall. 3 credits. Prerequisites: ILR 100 or 502, upperclass standing.
H. Z. Vasseur.
An examination of contemporary trade union issues that includes the context of the 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 labor movement will address the class. Midterm, final, and term paper are required.

Honors Program 495
Fall and spring (yearlong course). 3 credits each term. Admission to the ILR honors program may be 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) on honors project, entail research leading to completion of a thesis; must be proposed to an ILR faculty member who agrees to act as thesis supervisor; and (c) the project, endorsed by the proposed faculty advisor, is submitted to the Committee on Academic Standards and Scholarships. Accepted students embark on a two-semester sequence. The first semester consists of determining a research topic with guidance from a faculty member. The second semester completes the data collection and preparation of the honors thesis. Additional credit may be obtained by completing a committee of the thesis supervisor, a second faculty member designated by the appropriate department chairperson, and a representative of the Academic Standards Committee.

Internship 497–498
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 committee for approval by the Academic Standards Committee. Approval of the internship, the Office of Student Services will register each student for 497, for 3 credits in 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.

Directed Studies 499
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 registration for approval of their projects for approval by the Academic Standards Committee.

Collective Bargaining 500
Fall or spring. 3 credits.
Open only to graduate students. Recommended: ILR 501 taken previously or concurrently. D. Cullen, H. Katz, D. Lipsky, R. Seeber.
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 setting industrial conflict, the various substantive issues, and important developments and trends in collective bargaining.

Labor Relations Law and Legislation 501
Fall or spring. 3 credits.
T. Cravens, 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 adjustment of the collective agreement are considered, as are problems of protecting the individual-member-employee rights with the union.

Labor Union History and Administration 502
Fall or spring. 3 credits.
A presentation of the history of labor in America with emphasis on post–Civil War trade union development. Includes an analysis of the structure and functions of the various units of labor organization ranging from the national federation to the local union, and some consideration of special problems and activities such as democracy in trade unions, and health and welfare plans, as well as of various types of unions, such as those in construction, maritime trades, entertainment, transportation, and basic industry.

Advanced Seminar in Labor Arbitration 600
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 laboratory exercises in the presentation of an arbitration case, 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 cases problems of things in state and federal employment and public education as well as in the private sector.

The Bargaining Process: Theory and Practice 601
Fall. 3 credits. Prerequisite: ILR 200 or 500.
D. Lipsky.
Focus is on theories of the bargaining process, including economic, game, behavioral, and sociopolitical approaches to the bargaining process. 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 bargaining models will be made; 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.

Arbitration 602
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 place 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.

Governmental Adjustment of Labor Disputes 603
Fall or spring. 3 or 4 credits. Prerequisites: undergraduates, ILR 200, graduate students, ILR 500.
D. Cullen.
An examination of the various governmental techniques for dealing with labor disputes in the public sector, including mediation, fact-finding, and 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.

Readings in the Literature of American Radicalism and Dissent 604
Fall or spring. 3 credits. Limited to seniors and graduate students. Each term, concentration is on a different historical aspect of American radicalism and dissent. Some examples of areas and writers who might be selected for study are: agrarian reform—Thomas Skidmore, George Henry Evans, and Ignatius Donnelly; anarchism—Josiah Warren, William D. Haywood, Emma Goldman, and Paul Goodman; communism—John Reed, Jay Lovell, and William Z. Foster; economic dissent—Henry George, Thorstein Veblen, and Francis Everett Townsend; equal rights for blacks and black nationalism—William E. B. DuBois and Marcus Garvey.

Readings in the History of Industrial Relations in the United States 605
Fall. 3 credits. Limited to seniors and graduate students. Prerequisites: seniors, ILR 100 and 101; graduate students, ILR 502.
C. Daniel, G. Korman, J. Morris.
A seminar covering, intensively and in historical sequence, key documents, studies, legislative investigations, and memoirs concerning American industrial relations systems. Primarily designed to aid students in understanding themselves systematically and thoroughly in the field. Among the authors and reports covered are E. P. Thompson, John R. Commons, Norman Ware, Lloyd Ulman, the Abram Hewitt hearings, the Henry Ford hearings, the United States Industrial Commission, Philip Taft, Paul F. Brissenden, and the United States Commission on Industrial Relations.

Theories of Industrial Relations Systems 606
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, or J. Morris.
An examination of the leading theories concerning the origins, forms, organization, administration, aims, functions, and methods of industrial relations systems. Among the theories studied are those formulated by Karl Marx, Max Weber, Georgiou, Vladimir Lenin, Lujo Bretono, Beattice and Sidney Webb, Herbert Croly, Antonio Gramsci, Selig Perlman, Frank Tannenbaum, the Guild Socialists, Karl Polanyi, Clark Kerr, Frederick Harbison, John Dunlop, and Charles A. Myers.

607 Arbitration and Public Policy
Spring. 3 credits. Limited to 10 students and 10 law students. Prerequisite: I&LR 201 and permission of instructor. J. Gross.
Labor arbitration in the public and private sectors. Students will write research memoranda, briefs, and arbitral 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. Prerequisite: undergraduates, I&LR 201; graduate students, I&LR 502. Staff.
The areas of study are determined each semester by the instructor offering the seminar.

609 Law of Workers' Compensation
Fall. 3 credits. Prerequisite: I&LR 201 or 501 or permission of instructor. J. Burton.
A survey of 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 negotiation suits by injured workers.

680 Problems in Union Democracy
Fall or spring. 3 credits. M. Gold, P. Ross.
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; rights of minorities; the judicial process, including impartial review; local-national relationships; constituency and representation; the legislative process; and executive power and functions. The regulation of private government by the state will be considered.

681 Labor Relations Law
Spring. 3 credits. 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 Special Topics in the History, Administration, and Theories of Industrial Relations
Fall or spring. 3 credits. Prerequisites: undergraduates, I&LR 100 and 101; graduate students, I&LR 502.
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. Prerequisite: I&LR 201 or 501 or equivalent. T. Grifols, M. Gold.
An examination of the 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 paid to the question of how state employment discrimination claims 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 arrangements for public school employees, the context 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, I&LR 201, 202, graduate students, I&LR 501 and 502. J. Burton, R. Donovan, P. Ross, R. Sebe.
An examination of public sector collective bargaining, and extent of collective bargaining between federal, state, and local governments and their employees. The variety of legislative approaches to such matters as the representation of bargaining units, scope of bargaining, impasse procedures, and the strike against government are considered along with the 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: I&LR 200 or 500, and permission of instructor. D. Cullen, D. Lipsky, P. Ross.
An intensive study of the most significant current issues, and problems facing employers and unions in their relationship with each other, with particular emphasis on the substantive matters 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, I&LR 200 and 240, graduate students, I&LR 500 and 540, or permission of instructor. R. Lieberwitz.
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. From this perspective 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 analyzed. The effects of collective bargaining on union membership, public policy on union and bargaining power, 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 direction of a faculty member by graduate students who have been selected for an 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.
Study of the research conducted by a student in the direction of a member of the faculty.

800 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.
This workshop is designed to provide a forum for the presentation of current research being undertaken by faculty members and graduate students in the Department of Collective Bargaining and by invited guests. All M.S. and Ph.D. candidates in the department who are engaged in work on their theses are 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, L. Stefanski, P. Veileman

219 Statistics (Statistical Reasoning) Fall or spring. 3 credits. Not open to engineering or graduate students. Attendance at the first lab of the term is essential. An introduction to the basic concepts of statistics: measurement of location and dispersion; estimation and confidence intervals, hypothesis tests, regression and correlation. Spring. Students are taught to use a computer at the beginning of the term and use it for most of the weekly assignments.

211 Economic and Social Statistics Fall or spring. 3 credits. Prerequisite: I&LR 211 or equivalent. Computer packages are used as an aid to obtain problem solutions. Additional topics include statistical inference, simple and multiple regression and correlation, applications of regression, elements of time series analysis, and the design of sample surveys. Use of a computer is taught at the beginning of the term, and it is used throughout the course.

310 Design of Sample Surveys Spring. 3 credits. Prerequisite: one term of statistics. Application of statistical methodology 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 market research and advertising and opinion research.

311 Statistics II Fall. 4 credits. Prerequisite: I&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 percentages, means, variances, and correlation coefficients, with an introduction to nonparametric methods, analysis of variance, and multiple regression and correlation.

312 Applied Regression Methods Fall. 3 credits. Prerequisite: I&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, multicollinearity, variable selection methods, and analysis of variance.

411 Statistical Analysis of Qualitative Data Spring. 3 credits. Prerequisite: I&LR 311. 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 spring. 3 credits. A nontechnical course for graduate students in the social sciences without previous training in statistical method. Emphasis is on discussion of technical aspects of statistical analysis and on initiative in selecting and applying statistical methods to research problems. The subjects ordinarily covered include analysis of frequency distribution, regression and correlation analysis, and selected topics from the area of statistical inference.

511 Statistical Methods for the Social Sciences Spring. 3 credits. Prerequisite: I&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), logistic regression, and analysis of variance. Statistical computing packages will be used extensively.

610 Seminar in Modern Data Analysis Fall. 3 credits. Prerequisite: I&LR 311 or equivalent. P. Veileman. An advanced survey of modern data analysis methods. Topics include exploratory data analysis, robust methods, regression methods, and diagnostics. Extensive outside readings cover recent and historical work. Participants should have some knowledge of multiple regression, including the use of matrices (Statistics and Biometry 416 may be taken concurrently), and some experience using a computer.

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 instrumental variables and nonlinear (e.g., generalized linear models, polynomial models) errors-in-variables models.

711 Advanced Topics in Linear Regression Spring. 3 credits. Prerequisite: I&LR 312 or equivalent. This course discusses linear regression models in the context of 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 multilinear regression.

712 Theory of Sampling Fall. 3 credits. Prerequisite: calculus and at least one semester of mathematical statistics. Not offered 1985-86. A companion course to I&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, especially 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 industrialized non-Western countries, including Japan, the Soviet Union, Yugoslavia, 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 I&LR 330 (see description for I&LR 330). If enrollment warrants, they will also meet separately at a time to be arranged for discussion of topics in I&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 I&LR 331 (see description for I&LR 331). If enrollment warrants, they will also meet separately at a time to be arranged for discussion of topics in I&LR 331 and related topics.

532 Labor in Developing Economies Spring. 3 credits. G. Fields. Students in this course attend the lectures in I&LR 332 (see description for I&LR 332). If enrollment warrants, they will also meet separately at a time to be arranged for discussion of topics in I&LR 332 and additional topics.

630 Seminar in American Labor and International Affairs Spring. 3 credits. Prerequisite: undergraduate, I&LR 330 or 331; graduate students, I&LR 530 or 531. J. Windmuller. Subjects usually covered include organized labor and U.S. foreign policy; the history, structure, and activities of international trade union organizations; the work of
the ILO; and the labor issues raised by the operation of multinational corporations.

799 Directed Studies
For description see the section on Collective Bargaining, Labor Law, and Labor History.

Labor Economics


140 Development of Economic Institutions
Spring. 3 credits. Prerequisite for non-ILR 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 1914, (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 or spring. 3 credits. Prerequisites: Economics 101–102 or equivalent.

Staff.

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, such as job training and education, and 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.

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 public and private efforts to provide security, and the problems of integrating public and private programs. An examination is made of proposals for amending or modifying existing social security measures.

343 Problems in Labor Economics
Fall or spring. 3 credits.

Staff.

Devoted to new policy issues and to recent literature in the field. 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.

440 The Economics of Fringe Benefits
Spring. 3 credits. Open to juniors, seniors, and graduate students.

O. Mitchell.

An analysis and appraisal of private health, welfare, and pension plans. Consideration of the origin and development of fringe benefits, government programs, a critical examination of the financing, administration, and general effectiveness of the plans.

441 Income Distribution
Fall. 3 credits. Open to upperclass and graduate students.

R. Hutchens.

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.

485 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. 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 voluntary efforts to provide security, and the problems of integrating public and private programs. An examination is made of proposals for amending or modifying existing social security measures.

[642 Work and Welfare: Interactions between Cash-Transfer Programs and the Labor Market
Fall. 3 credits. Prerequisite: some familiarity with microeconomics. Not offered 1985–86.

R. Hutchens.

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. Top 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.]

643 Special Topics in Labor Economics
Fall or spring. 3 credits.

Staff.

Devoted to new policy issues and to recent literature in the field. The specific content and emphasis varies in response to the interests of the faculty member teaching the course.

644 The Economics of Occupational Safety and Health
Spring. 3 credits.

R. Smith.

This 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.

Prerequisites: 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.

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 economics 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.

ILR 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 (also Economics 642)
Spring. 3 credits.

R. Hutchens.

Reading and discussion of selected topics in labor economics in the fields of theory, institutions, and policy.

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.

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

S. Bacharach, chairman; S. Barley, L. Gruenfeld, T. Hammers, R. Stern, P. Tolbert, H. Trost, L. Williams

120 Introduction to Macro Organizational Behavior and Analysis
Fall. 3 credits.

P. Tolbert.

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.
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 these disparities, 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 forms of compensation structures in large-scale organizations.

326 Sociology of Occupations Fall or spring. 3 credits. 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, traditions; (2) nature and expression of professionalization of occupations; (3) organizational characteristics of occupations: accommodation to formal organizational associations, and occupational mix; (4) social psychological characteristics of occupations: temperamental and intellectual role demands, occupational attraction, identity, and occupational self-images; (5) relationship between 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.
An application of frustration theory to the analysis of conflict and stress in organizations and society. Comparisons are made between industrial relations, race relations, ethnic 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 Spring. 4 credits. Prerequisite: two courses in social psychology or equivalent.
An examination of theory and empirical evidence relating to the resolution of interpersonal, intergroup, and international conflict. Specific attention is devoted to studying factors that contribute to the development of cooperative and competitive bonds between self-images. The following topics are studied: the availability and use of threat; the credibility, intensity, and costs of threat; fractioning and escalating conflict. Personality and situational factors that regulate conflict intensification are stressed.

329 Organizational Cultures Fall or spring. 3 credits. Limited to 45 students. Prerequisite: one or more courses in sociology 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 behavioral rules and the cultural forms that carry these cultural messages, rituals, symbols, myths, sagas, legends, and organizational stories. Considerable attention will be given to rites of passage and ceremonies as a cultural form in organizational life that consolidates major 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, especially the part played by occupational subcultures in formal organizations. Emphasis will be placed on empirical examples from both the organizational behavior literature and the professor'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. T. Hammer.
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 these apply to individuals and groups in formal organizations. Readings are provided in organizational psychology, supplemented by relevant contributions from experimental, social, and clinical psychology. Each student will design, execute, and analyze a research study of his or her own.

371 Individual Differences and Organizational Behavior Fall. 4 credits. Recommended: some acquaintance with the substance and methods of behavioral or social science. L. Gruenhed.
This course examines personality types from both a comparative cultural and psychological point of view. Societal, organizational, and individual personality traits and work motivation are used to illustrate how various theories could be applied to understand behavior and experience in organizations. Communal (expressive), corporate (instrumental), and carnivore (power) strategies of adaptation are examined and contrasted.

372 Sociological Models of Organizations Spring. 3 credits. Prerequisites: 18LR 120 and 121 or equivalent. P. Tolbert.
Introduces students to the basic issues involved in the sociological analysis of organizations. Traces the development of organizational theory from Max Weber to the most recent research. Among the themes to be discussed are internal structure of organizations, communication in organizations, decentralization, organizational change, organizational technology, and organizational environment.

373 Organizational Behavior Simulations Fall or spring. 3 credits. Prerequisite: 18LR 120 and 121 or equivalent. R. Stern.
Basic principles of organizational behavior are studied through participation in three simulation games. The first game, The Organizational Game: Design, Change, and Development, by Miles and Snow and Killough, is a simulation involving the organizational behavior literature. The second, The Fuzzy Game, by Patton and Locket, simulates a cooperative. A third game models executive decision making. Organizational design, decision making, and conflict are the central topics of discussion. The contrasting roles of power in the organizations permits the student to assume the critical assumptions underlying structure and process.
420 Group Processes Fall. 4 credits. L. Gruenfeld.
Several conceptual and methodological approaches are applied to the observation of personality in groups. Students observe, analyze, and quantify behavior in ongoing groups. Emphasis is on 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. 4 credits. S. Bacharach.
Field research in public sector organization such as a school bureaucracy or a social welfare bureaucracy. Students conduct a major study in which they integrate themes from organizational theory. Theoretical issues such as decentralization, participation, and communication are discussed in the seminar.

425 Sociology of Industrial Conflict Spring. 4 credits. R. Stern.
The focus is on the variety of theoretical and empirical evidence available concerning social, economic, and political causes of industrial conflict. The manifestations of conflict, such as strikes, labor turnover, absenteeism, and sabotage, and the influence of the environments in which they occur is emphasized.

426 Theories of Industrial Society Fall. 4 credits. L. Gruenfeld.
Prerequisite: I&LR 102 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.
Fall and spring (yearlong course). 3 credits each term.
For description see the section on Collective Bargaining, Labor Law, and Labor History.

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 field seminar. Students will be required 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.
Prerequisite: permission of instructor.
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 will be discussed. The implications for the interpretation of, leadership style, as evidenced by different superintendents' advisory techniques, (d) the collective bargaining process as reflected in both 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.

497-498 Internship Fall and spring, 7 weeks only. 2 credits.
Includes fieldwork and emphasizes assessment of program implementation.

499 Directed Studies Fall or spring. 3 and 6 credits.
For description see the section on Collective Bargaining, Labor Law, and Labor History.

520 Micro Organizational Behavior and Analysis Fall. 3 credits. L. Williams.
Prerequisite: I&LR 102 and 121.
S. Bacharach.
Survey of concepts, theories, and research from the fields of organizational and social psychology as these relate to the behavior of individuals 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. L. Williams.
Prerequisite: permission of instructor.
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 industrialization and internal structural transformation of large firms in the United States economy.

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. Trice.
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 evaluating the results of research on innovations. Readings are interdisciplinary and include sociology, psychology, and political science.

621 Organizational Diagnosis Intervention and Development Spring. 4 credits. Prerequisites: L. Gruenfeld; I&LR 120 and 121; 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 normative and descriptive theories of individual and group development and effectiveness. The course emphasizes both quantitative and qualitative data processing procedures.

622 Organizations and Environments. Spring. 3 credits. P. Tolbert.
This course will survey the literature on organization-environment relations, including work on organizational flexibility, personal 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. Prerequisite: Senior standing, and one of these courses: I&LR 371 or I&LR 629 or equivalent, or permission of instructor. L. Gruenfeld.
This is a social psychology course that emphasizes the building, maintenance, and renewal of purposeful 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 industrialization and internal structural transformation of large firms in the United States economy.

627 Leadership in Organizations Spring. 3 credits. Prerequisite: two organizational behavior courses at the 300 level, or advanced courses in sociology or psychology.
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, organizational development, and action research are explored.
Continuation of recent research efforts is examined, and the dynamic nature of the research process is emphasized. The realities of field research are explored, including problems of gaining and sustaining rapport, the initial development of research interviews and observation data, and their conversion to quantitative instruments. Participants share in the exploration of appropriate 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 Fall. 4 credits. L. Williams. 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 Fall. 3 credits. L. Williams. A proseminar of current topics in organizational psychology. Discussions based on current research and theoretical innovations in the field.

724 Behavioral Research Theory, Strategy, and Methods I Fall. 3 credits. L. Gruenfeld. 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 show how and under what conditions different motivation models can be used in practice in work organizations.

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 classic formulations of conflict theory in sociology, then the social, political, economic causes of industrial conflict. Forms of conflict to be studied include strikes, turnover, absenteeism, and sabotage. Some discussion of the implications of various types of worker management of firms for industrial conflict will be included.

728 Seminar on Work Motivation Spring. 2 or 4 credits. Prerequisites: I&LR 520–521. L. Hammer. Two independent but sequence-connected minicourses.

(1) Theories of Work Motivation. 7 weeks. 2 credits. Course will provide an introduction to the 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 show 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, theories underlying the design of jobs and work tasks are examined together with empirical research in job design and related areas (work motivation, worker participation). The course will cover early approaches to job design from the introduction of scientific management and proceed through the initial efforts to humanize work with socio-technical design to discussion principles to the recent developments in job design and quality-of-work-life programs in organizations.

729 Organizational Design and Organizational Change Spring. 3 credits. I. Bacharach. Focus is on the application of analytical concepts of organizational science to the practical needs of changing organizations. Emphasis will be on work design, organizational design, incentive systems, and quality-of-work-life programs as mechanisms for enhancing organizational efficiency. Students will be required to write two papers: one reviewing the literature on a relevant theoretical issue, and the second on a detailed examination of a specific case of organizational change. A number of practitioners will be guest lecturers in this seminar.

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. Staff. 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 Management Fall or spring. 3 credits. Open to I&LR students. Non-I&LR students may take I&LR 151.

Staff

An introductory overview of the management of human resources from an institutional perspective. Topics include human resource planning, personnel decisions, staffing, employee development, work system rewards, and employee relations. Emphasis is on (a) problem-solving and decision-making approaches; (b) operational methods, techniques, 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.

Human Resource Economics and Public Policy Fall or spring. 3 credits. Open to sophomores, juniors, and seniors.

V. Briggs

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 "old" program in apprendiceship, vocational education, and vocational rehabilitation, as well as the "new" training programs, are studied. Special policy issues pertaining to youth, rural workers, welfare reform, public service employment, worker relocation, economic development, targeted tax credits, industrial policy, and "enterprise zone" proposals will be examined. Comparisons are made with European initiatives.

Effective Supervision Fall. 3 credits. Limited to juniors and seniors. Prerequisite: I&LR 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.

New York State Human Resource and Employee Relations Issues and Policies Fall or spring. 3 credits. Open to I&LR students participating in an internship.

J. Sicom

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.

Women at Work Fall or spring. Variable 3 or 4 credits. Prerequisite: I&LR 260 or equivalent.

F. Miller

Various aspects of female occupational roles in twenty-first-century United States. Historical, social, and legal factors that influence women's choice of careers, work socialization and training, and subsequent labor-market experiences will be examined. Working women's entry-level jobs, opportunities for advancement, and income are compared to men's.


3 credits. Open to I&LR students participating in Washington, D.C., internship.

S. Levitan

The seminar will examine labor-market developments and their measurements, with emphasis on current social strategies to ameliorate social problems. The systematic relationships between the elements of various programs, 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.

Immigration and the American Labor Force Spring. 3 credits. Prerequisite: I&LR 260 or equivalent. 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. In addition to legal immigration, border commuters, the topics of illegal immigration, refugees, asylees, and nonimmigrant workers are also examined. Comparisons are also made with immigration systems of other nations. Public policy aspects are explored in depth.

Honors Program Fall and spring (yearlong course). 3 credits.

For description see the section on Collective Bargaining, Labor Law, and Labor History.

Internship Fall or spring. 3 and 6 credits.

For description see the section on Collective Bargaining, Labor Law, and Labor History.

Directed Studies

For description see the section on Collective Bargaining, Labor Law, and Labor History.

Personnel Management Fall or spring. 3 credits.

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.

Personnel and Human Resource Management in the Eighties Fall. 3 credits. Limited to 25 students, seniors and graduate students only. Prerequisite: permission of instructor.

R. Risley

Seminar will be concerned with those areas of personnel and human resource management that leading practitioners believe will be of increased importance or will have significant change during the coming decade. 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 and to have completed any advance assignments suggested by the guest seminar leader.

Internal Staffing: Managing Careers in Organizations Spring. 3 credits. Prerequisite: I&LR 260 or 560 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 career planning methods and techniques, career and life stages, mentoring, lifetime employment systems, entrepreneurship, midlife career changes, criteria for internal promotions, and the role of performance evaluation and assessment centers in placement decisions.

Performance Evaluation Fall or spring. 3 credits. Prerequisite: I&LR 260 or 560 or equivalent, and permission of instructor.

B. Gerhart

Developing an understanding of the importance and dilemma of conducting an effective performance evaluation program. Emphasis will be given to (1) objectives of performance appraisal; (2) linkage to job analysis; (3) legal requirements of objective factors affecting appraisal accuracy, (5) measurement issues; and (6) the appraisal interview process. Emphasizes theory as well as practice.

Applied Personnel and Organizational Development Practice Spring. 3 credits.

Prerequisite: undergraduates, I&LR 260; graduate students, I&LR 560 or equivalent.

Staff.

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 requires 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, and/or critical issue. In addition, the final project requires a comprehensive proposal that describes an organizational development intervention.

Managing an Organization through Simulation Training Fall or spring. 3 credits. Limited to a total of 40 ILR and hotel administration students, seniors and graduate students only. Prerequisite: I&LR 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 as to the effect of their decisions in the organization as 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 effects 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.

Job Matching: Job Search and Organizational Recruiting Spring. 3 credits. Prerequisites: undergraduates, I&LR 260; graduate students, I&LR 560.

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).

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.

Case Studies in Personnel Administration Spring. 3 credits. Enrollment limited. Prerequisite: I&LR 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. The first few weeks of the course involve an introduction to basic computer concepts. The remaining weeks are taken up with cases and exercises whose solutions involve data accessing, manipulation, and analysis. The purpose is to help provide the computer knowledge and analytical skills necessary to function effectively in modern personnel departments.

**691 Human Resource Planning**

Spring. 4 credits. Prerequisite: 660 or 560 or equivalent, two courses in statistics, and permission of instructor.


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: 660 or 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 to the concept 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: 660 or 560 or equivalent, at least one upper-level PHRS elective; basic statistics; and permission of instructor.

J. Boudreau, B. Gerhart, S. Rynes.

An analysis of personnel management activities and the relevant costs and benefits for human resource management decisions, introduce models from other disciplines that are relevant to human resource decisions, and provide an opportunity to develop and apply these decision-making techniques to actual human resource decision situations.

**700 Seminar: New Concepts in Pay**

Fall or spring. 3 credits.

G. Milkovich.

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 for points of contradiction and/or consistency. Research related to executive compensation, strategic compensation issues, game sharing, and comparable worth will also be examined.

**761 Human Resource Economics and Public Policy**

Spring. 3 credits.

V. Briggs.

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 through public policy measures. Changes in the "older" programs of apprenticeship, vocational education, and vocational rehabilitation as well as the "new" programs of the post-CETA era are studied. Special policy issues pertaining to youth, rural workers, welfare reform, public service employment, industrial policy, 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**

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.

**960 Workshop in Personnel and Human Resource Studies**

Fall or spring. 2 credits. Enrollment limited to M.S. and Ph.D. candidates; S-U grades only.

Staff.

This workshop is designed to provide a forum for the presentation and critical discussion of current research being undertaken by graduate students, faculty members, and invited guests in the field of personnel and human resource studies. All M.S. and Ph.D. candidates in the Department of Personnel and Human Resource Studies are urged to enroll; candidates in other departments are cordially invited to do so. Each participant will have an opportunity to benefit from the collective wisdom of the others in the formulation, design, and execution of his or her research, as well as to become current on the latest developments in the field.

**Interdepartmental Courses**

**150 Labor Problems in American Society**

Spring. 3 credits.


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 ILR students.

Staff.

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 explored. 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.

260 Personnel Management
Fall or spring. 3 credits.
Focuses on management of personnel in organizations. Deals with manpower planning, recruiting, selection, wage and salary administration, training, performance appraisal, organizational development, and the administration of personnel department activities. Special attention is paid to government manpower policy and its implication for personnel management.

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 or institutional purposes and 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-Griffith 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, employment and investment rights, 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 serves as an introduction to 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: descriptive statistics (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 wage determination, theories of wages and 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 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 described as a formal and 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 discussion are concerned with interpersonal attraction, conformity, interaction process, leadership, group effectiveness, norms, etc. Laboratory experiences in group tasks are provided.

440 Health, Welfare, and Pension Plans
Fall or spring. 3 credits.
An analysis and appraisal of private health, welfare, and pension plans and programs and the role, and qeneral effectiveness of the plans.

602 Arbitration
Fall or spring. 3 credits.
A study of the place 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.

681 Labor Relations Law
Fall or spring. 3 credits.
An advanced course in labor law, covering such topics as emergency labor disputes, legal problems of labor relations in public employment, labor and the constitutional laws, civil rights legislation, rights of individual employees and union members, and legal problems of union administration.

683 An Analysis of the Union Steward's Role
Fall or spring. 3 credits.
The course is an examination of the steward's role in relation to the local union and the workplace setting. Attention is directed to how industrial conflict, economics, technological constraints, social organization, and tactics and strategies of the steward are related. Consideration is also given to authority of the steward, to conflicting expectations associated with the role, and to comparative studies of stewards. In general, the steward's role is used as a focal point for understanding important aspects of the workplace and the union. The student is expected to write a research paper on a salient aspect of the steward's role and social structure.

684 Employment Discrimination and the Law
Fall or spring. 3 credits.
An examination of legal problems involving employment discrimination based upon 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 will be discussed. The purposes of affirmative action under Executive Order No. 11246, as amended, will be analyzed. Special attention will be given to the role of state law in resolving employment discrimination claims and the procedural framework for raising and adjudicating such claims before administrative agencies and the courts.

686 Collective Bargaining in the Public Sector
Fall or spring. 3 credits.
An examination of the development, practice, and extent of collective bargaining between federal, state, and local governments and their employees. The course will emphasize public policy issues related to sovereignty, union designation, representation procedures, and the strikes against government.

689 Labor Education
Fall or spring. 3 credits.
Prerequisites: permission of instructor.
An examination will be made of labor education, its origin, development, scope, form, functions, curricula, goals, issues, and roles in universities, unions, and other organizations. Attention will be devoted to various practical aspects associated with the administration of programs and to labor education as an occupation. The course will involve students in field activities in connection with current Extension Division programs.

Upstate

The following courses are open only to participants in the Extension Division's statewide credit programs in labor studies and management studies. These courses are not open to undergraduate or graduate students matriculated in the Ithaca ILR programs.

251 Principles and Practices of Management
Fall or spring. 3 credits.
Prerequisites: permission of instructor.
This course presents the theory and processes of management with an emphasis on supervision. Management functions of planning, organizing, staffing, and evaluating are included. Concepts and theories are presented, and case studies are analyzed. Motivating people, exercising leadership, and effectively developing employees are emphasized.
252 Contract Bargaining Fall or spring. 3 credits. Examines the principles of contract bargaining, including bargaining environments and structures as well as standards used in bargaining. Students will learn to prepare bargaining demands, cost economic items, draft noneconomic contract language, negotiate economic and noneconomic issues, and resolve contract bargaining impasse. The course will consider the impact of contract bargaining outcomes on workers, unions, employers, and the public.

253 Contract Administration Fall or spring. 3 credits. Focuses on the role of the steward in administering the union contract in the workplace. Students will evaluate grievance procedures and contract clauses, the grievance procedure in practice, the role of the union steward, the role of local and international unions, negotiation of grievances, and preparation for arbitration. Students will analyze the impact of grievance and arbitration procedures on workers, unions, and employers.

254 Labor Law Fall or spring. 3 credits. Examines the principles of labor law by looking at social philosophy and the historical context of federal labor legislation from the 1930s. Students will concentrate on the National Labor Relations Act, examining how the National Labor Relations Board and the federal courts have interpreted the national labor laws. Discussion will include new directions in labor law, and interpret a case with consideration given to the impact of labor law on workers, unions, and employers.

255 Labor History Fall or spring. 3 credits. Reviews American labor history from the perspective of workers' social dimensions of the development of the working class, reform and revolutionary movements, and the emergence of craft, industrial, and public employee unions. Included will be a discussion of the development of trade union institutions and leaders and the evolution of union political activities and collective bargaining. Special attention will be paid to the involvement of women and minority workers with unions.

256 Dispute Resolution Fall or spring. 3 credits. Examines third-party participation in dispute resolution in private and public sector collective bargaining. Development of dispute resolution methods in American labor relations; issues and practices in neutral, binding arbitration of grievances and mediation; conciliation; and fact-finding procedures will be discussed. We will also look at exit and contract-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. Designed to illustrate how behavioral science theory leads to a better understanding of organization and research provide a basis for practical application in business, industry, education, and government.

259 Union Administration 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 development of organizational leadership. 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 also examines the structure and evolution of relationships inside the labor movement.

261 Introduction to Audio-Radio Production for Trade Unionists Fall or spring. 2 credits. An examination of the role that radio and other media play in carrying labor's message to the public. Students will learn basic writing, interviewing, and technical skills necessary for the production of radio programs. All students will be expected to participate in a class audio project.

357 Labor Education Fall or spring. 3 credits. A course that examines the role decision making and lines of activity and collective bargaining. It will consider the role of negotiation and the emergence of craft, industrial, and public alternatives methods of dispute resolution. Examines third-party participation in dispute resolution development of trade union institutions and leaders and involvement of women and minority workers with unions.

458 Labor Education II Fall or spring. 3 credits. The course will be divided into two parts: Part I is designed to develop an understanding of the theories program organization and administration, including budgeting, which is necessary if labor education is to be transferred to the local union level. Part II joins theory and practice in the effort to (1) provide rank and file union leaders with the opportunity to develop and use research skills, (2) gather subject matter expertise, (3) formulate course outlines from which to teach, and (4) select appropriate teaching methods and prepare materials for classroom use. Practice teaching is a necessary component of such an advanced course, again providing experiences that combine theory and practice.

359 Directed Studies in Labor Education Fall or spring. 3 credits. Designed to grant credit for fieldwork under the direction of members of the faculty. Third semester of an intensive training program in labor education for students with demonstrated ability to undertake independent work who have been carefully screened and selected for participation in this course. Combines 180 hours of fieldwork in a union education or related program with 3-hour seminars in the classroom. Classroom meetings are devoted to (1) in-depth analysis of union experiences in relation to labor education, theory, method and techniques, and (2) individual consultations.

Faculty Roster

Aronson, Robert L., Ph.D., Princeton U. Prof., Labor Economics
Bachrach, Samuel, Ph.D., U. of Wisconsin. Prof., Organizational Behavior
Barley, Stephen R., Ph.D., Mass. Inst. of Technology. Asst. Prof., Organizational Behavior
Blumen, Isadore, Ph.D., U. of North Carolina. Prof., Economic and Social Statistics
Boudreau, John W., Ph.D., Purdue U. Asst. Prof., Personnel and Human Resource Studies
Boyer, George R., Ph.D., U. of Wisconsin. Asst. Prof., Labor Economics
Briggs, Vernon M., Jr., Ph.D., Michigan State U. Prof., Personnel and Human Resource Studies
Clark, M. Gardner, Ph.D., Harvard U. Prof., Labor Economics/International and Comparative Labor Relations
Cullen, Donald E., Ph.D., Cornell U. Prof., Collective Bargaining, Labor Law, and Labor History
Dwyer, Lee D., Ph.D., U. of Wisconsin. Prof., Personnel and Human Resource Studies
Ehrenberg, Ronald, Ph.D., Northwestern U. Prof., Labor Economics
Farley, Jennie T., Ph.D., Cornell U. Assoc. Prof., Extension
Fields, Gary S., Ph.D., U. of Michigan. Prof., Labor Economics
Frank, William W., Ph.D., Michigan State U. Prof., Extension/Personnel and Human Resource Studies
Galenson, Walter, Ph.D., Columbia U. Jacob Gould Schurman Professor of Labor Economics/International and Comparative Labor Relations
Gray, Lois S., Ph.D., Columbia U. Prof., Extension
Gruenfield, Leopold W., Ph.D., Purdue U. Prof., Organizational Behavior
Hadi, Ali S., Ph.D., New York U. Asst. Prof., Economic and Social Statistics
Hammer, Tove H., Ph.D., U. of Maryland. Assoc. Prof., Organizational Behavior
Henderson, Luis M.S., Mass. Inst. of Technology. Prof., Extension
Hutchens, Robert M., Ph.D., U. of Wisconsin. Assoc. Prof., Labor Economics
Ibukuro, George H., Ph.D., U. of Wisconsin. Asst. Prof., Labor Economics
Keenan, 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., U. of Wisconsin. Prof., Economic and Social Statistics
Milkovich, George T., Ph.D., U. of Minnesota. Prof., Personnel and Human Resource Studies
Miller, Frank B., Ph.D., Cornell U. Prof., Personnel and Human Resource Studies
Mitchell, Oliver H., Ph.D., U. of Wisconsin. Assoc. Prof., Labor Economics
Riley, Robert F., Ph.D., Cornell U. Prof., Personnel and Human Resource Studies
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
Smith, Robert S., Ph.D., Stanford U. Prof., Labor Economics
Stefflani, Edward A., Ph.D., U. of North Carolina. Asst. Prof., Economic and Social Statistics
Stern, Robert N., Ph.D., Vanderbilt U. Assoc. Prof., Organizational Behavior
Tolbert, Pamela S., Ph.D., U. of California. Prof., Organizational Behavior
Trice, Harrison M., Ph.D., U. of Wisconsin. Prof., Organizational Behavior
Ullman, R. M., Ph.D., Princeton U. Assoc. Prof., Economic and Social Statistics
Wamsnus, William J., B.A., Indiana U. Prof., Extension/Personnel and Human Resource Studies
Williams, Lawrence K., Ph.D., U. of Michigan. Prof., Organizational Behavior
Windmiller, 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
Anne Lukingbeal, associate dean of student affairs and director of admissions
Robert B. Kent, associate dean for academic affairs and professor of law
Albert C. Neimeth, associate dean and director of alumni affairs and placement
John Lee Smith, dean of students
Frances M. Bullis, director of 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.

First-Year Courses

500 Civil Procedure
502 Constitutional Law
504 Contracts
506 Criminal Justice
507 Legal Process
508 Practice Training I
509 Practice Training II
512 Property
515 Torts

Upperclass Courses

600 Accounting for Lawyers
602 Administrative Law
604 Admiralty
605 Advanced Civil Procedure
607 American Legal History
608 Antitrust Law
616 Commercial Law
618 Comparative Law
620 Conflict of Laws
621 Constitutional Remedies
622 Corporations
624 Criminal Procedure
626 Debtor-Creditor Law
628 The Early Development of Anglo-American Common Law
630 Employment Discrimination
634 Enterprise Organization
636 Environmental Law
638 Estate and Gift Taxation
640 Evidence
641 Fact Investigation
642 Family Law
644 Federal Courts
646 Federal Income Taxation
647 Freedom of Expression
649 International Business Transactions
650 International Law
652 International Taxation
656 Interviewing and Counseling
658 Labor Law
660 Land-Use Planning
664 Law Practice Dynamics
666 Law, Society, and Morality
670 Lawyers and Clients
677 Products Liability
678 Professional Responsibility
680 Real Estate Transfer and Finance
682 Securities Regulation
688 Taxation of Corporations and Shareholders
690 Taxation of Partnership Income
692 Trial Advocacy

Problem Courses and Seminars

702 Children's Rights
704 Comparative Antitrust Law
706 Computer Applications in Law Practice and Legal Education
708 Constitutional Theory
710 Contemporary Legal Theory
712 Copyright, Trademark, and Patent Law
714 Corporate Practice
716 Death Penalty and Criminal Appellate Advocacy Seminar
720 Estate Planning
722 Ethics of Corporate Practice
724 European Economic Community
725 Family Law Clinic
730 International Business Transactions
734 International Human Rights
736 Labor Arbitration and Mediation
738 Labor Legislation
744 Law and Medicine
748 Law, Science, and Technology
752 Legal Aid I
753 Legal Aid II
754 Legal Information Systems
756 Legal Predicaments in Settling Lawsuits
760 Media Law Seminar
765 Problems in Criminal Justice
766 Problems in Criminal Procedure and Postconviction Remedies
768 Problems in Legislation
774 Professional Responsibility Seminar
778 The Religion Clauses of the First Amendment
780 Sex Discrimination and the Law

Faculty Roster

Alexander, Gregory S., J.D., Northwestern U. Prof.
Aman, Alfred C., Jr., J.D., U. of Chicago. Prof.
Barcelo, John J. Ill, 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
Curtiss, W. David, LL.B., Cornell U. Prof.
Dean, W. Tucker, J.D., U. of Chicago. Prof.
Eisenberg, Theodore, J.D., U. of Pennsylvania. Prof.

694 Trusts and Estates I
695 Trusts and Estates II

Faculty Roster
Farina, Cynthia, J.D., Boston U. Asst. Prof.
Gunn, Alan, J.D., Cornell U. 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
Henn, Harry G., J.S.D., New York U. Edward Cornell Professor of Law
Hillman, Robert A., J.D., Cornell U. Prof.
Johnson, Sheri L., J.D., Yale U. Asst. 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 I., 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.
Wolfram, Charles W., LL.B., U. of Texas. Charles Frank Reavis Sr. Professor of Law
Younger, Judith T., J.D., New York U. Prof.
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. Wittink, director, doctoral program
James W. Schmotter, associate dean for administration and acting associate dean for placement
Ann L. Calkins, assistant dean for external relations
Daniel Mansoor, director of development
Harriet A. Peters, assistant director for placement
Maria Blackburn, director of admissions
Anne Sandoe-Thorp, director of student affairs and financial aid
Eugene Ziegler, director of computer services
Betty Ann Olive, librarian
Ellen Hayth, registrar
Nancy Culligan, business manager
Linda Myers, publications coordinator

The Johnson Graduate School of Management prepares men and women for managerial careers in business. The school offers coursework 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**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NCC 502</td>
<td>Microeconomics for Management</td>
</tr>
<tr>
<td>NCC 503</td>
<td>Marketing Management</td>
</tr>
<tr>
<td>NCC 504</td>
<td>Organizational Theory and Behavior</td>
</tr>
<tr>
<td>NCC 505</td>
<td>Trade</td>
</tr>
<tr>
<td>NCC 506</td>
<td>Managerial Finance</td>
</tr>
<tr>
<td>NCC 507</td>
<td>Management Information Systems</td>
</tr>
<tr>
<td>NCC 508</td>
<td>Production and Operations Management</td>
</tr>
<tr>
<td>NCC 510</td>
<td>Business-Government Interface</td>
</tr>
<tr>
<td>NCC 511</td>
<td>Business Strategy and Policy</td>
</tr>
</tbody>
</table>

**NBA Business Administration Elective Courses**

**Accounting**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NBA 500</td>
<td>Intermediate Accounting</td>
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<tr>
<td>NBA 501</td>
<td>Advanced Accounting</td>
</tr>
<tr>
<td>NBA 502</td>
<td>Managerial Cost Accounting</td>
</tr>
<tr>
<td>NBA 504</td>
<td>Taxation Affecting Business and Personal Decision Making</td>
</tr>
<tr>
<td>NBA 505</td>
<td>Auditing</td>
</tr>
<tr>
<td>NBA 506</td>
<td>Financial Information and Evaluation</td>
</tr>
<tr>
<td>NBA 507</td>
<td>Federal Income Tax</td>
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**Economics**

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<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NBA 520</td>
<td>Pricing and Strategy</td>
</tr>
<tr>
<td>NBA 521</td>
<td>Regulation, Deregulation, and Antitrust: Government Regulation of Business Not offered 1985–86.</td>
</tr>
<tr>
<td>NBA 522</td>
<td>Topics in Managerial Economics Not offered 1985–86.</td>
</tr>
<tr>
<td>NBA 523</td>
<td>Business and Economic Forecasting</td>
</tr>
<tr>
<td>NBA 524</td>
<td>Competitive Industry Analysis</td>
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**Finance**

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<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NBA 540</td>
<td>Financial Policy Decisions</td>
</tr>
<tr>
<td>NBA 541</td>
<td>Economic Evaluation of Capital Investment Projects</td>
</tr>
<tr>
<td>NBA 542</td>
<td>Security Analysis and Investment Management</td>
</tr>
<tr>
<td>NBA 543</td>
<td>Financial Markets and Institutions</td>
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<tr>
<td>NBA 544</td>
<td>Seminar in Bank Management Not offered 1985–86.</td>
</tr>
<tr>
<td>NBA 545</td>
<td>Finance Theory</td>
</tr>
<tr>
<td>NBA 546</td>
<td>Options, Bonds, and Commodities</td>
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<tr>
<td>NBA 547</td>
<td>Investment Banking</td>
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**General Management**

<table>
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<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NBA 560</td>
<td>Associations Law</td>
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<tr>
<td>NBA 561</td>
<td>Advanced Business Law</td>
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</tbody>
</table>

**NBA 562** An Introduction to Estate Planning

**NBA 563** Strategic Business Policy Issues

**NBA 564** Entrepreneurship and Enterprise

**NBA 565** Law of Business Associations

**NBA 566** Ethical Dilemmas in Management Not offered 1985–86.

**NBA 567** Management Writing

**NBA 568** Oral Communication

**NBA 569** Effective Management Consulting

**International Management**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NBA 580</td>
<td>Industrial Policy: Lessons for the United States from Japan and Europe</td>
</tr>
<tr>
<td>NBA 581</td>
<td>Challenges to American Democracy</td>
</tr>
<tr>
<td>NBA 582</td>
<td>International Trade and Finance</td>
</tr>
<tr>
<td>NBA 583</td>
<td>The Environment of International Business in the Middle East</td>
</tr>
<tr>
<td>NBA 584</td>
<td>The Multinational Business Firm</td>
</tr>
<tr>
<td>NBA 585</td>
<td>International and Comparative Management</td>
</tr>
<tr>
<td>NBA 586</td>
<td>The Environment of International Business in Southeast and East Asia Not offered 1985–86.</td>
</tr>
<tr>
<td>NBA 587</td>
<td>Crisis and Change in the International Political Economy Not offered 1985–86.</td>
</tr>
<tr>
<td>NBA 589</td>
<td>Business in Japan</td>
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</tbody>
</table>

**Management Information Systems**

<table>
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<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NBA 600</td>
<td>Data-Base Management</td>
</tr>
<tr>
<td>NBA 601</td>
<td>Information Systems in Manufacturing</td>
</tr>
<tr>
<td>NBA 602</td>
<td>Microcomputers in Business</td>
</tr>
<tr>
<td>NBA 603</td>
<td>Systems Analysis</td>
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</tbody>
</table>

**Marketing**

<table>
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<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NBA 620</td>
<td>Marketing Research</td>
</tr>
<tr>
<td>NBA 621</td>
<td>Advertising Management Not offered 1985–86.</td>
</tr>
<tr>
<td>NBA 622</td>
<td>Marketing Strategy</td>
</tr>
<tr>
<td>NBA 623</td>
<td>Models and Methods for New Products</td>
</tr>
<tr>
<td>NBA 624</td>
<td>Marketing Decision Analysis</td>
</tr>
<tr>
<td>NBA 625</td>
<td>Marketing Management of Industrial Products Not offered 1985–86.</td>
</tr>
<tr>
<td>NBA 626</td>
<td>Consumer Behavior</td>
</tr>
<tr>
<td>NBA 627</td>
<td>Behavioral Marketing Not offered 1985–86.</td>
</tr>
<tr>
<td>NBA 628</td>
<td>Marketing Planning</td>
</tr>
<tr>
<td>NBA 629</td>
<td>Psychological Theories in Advertising</td>
</tr>
<tr>
<td>NBA 630</td>
<td>Marketing Research Project</td>
</tr>
</tbody>
</table>

**Operations Management**

<table>
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<tr>
<th>Code</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>NBA 640</td>
<td>Production Management</td>
</tr>
</tbody>
</table>
NBA 641 Business Logistics Management
NBA 642 Applied Econometrics
NBA 643 (NCE 566) Management Science

Organizational Behavior

NBA 660 Strategy Implementation: Process and Politics
NBA 661 Strategic Management and Behavioral Science
NBA 662 Power and Influence
NBA 663 Behavioral Decision Theory

[NBA 664 Organizational Development and Design Not offered 1985–86.]

NBA 666 Group Processes and Performance
NBA 667 Leadership and Motivation
NBA 668 Personnel and Human Resources

Public Management

NBA 680 Management of Urban Issues

[NBA 682 Public-Affairs Colloquium Not offered 1985–86.]

NBA 683 Managing Governmental Systems
NBA 684 Health-Services Organization and Financing
NBA 685 Health-Welfare Policy: Implications for Business and Economic Growth

NMI and NRE Research

NMI 500–502 Directed Readings and Research
NRE 502 Marketing Workshop
NRE 503 Advanced Seminar in Economics Theory
NRE 504 Advanced Seminar in Accounting
NRE 505 Finance Workshop

[NRE 506 Advanced Seminar in Banking and Financial Markets Not offered 1985–86.]

[NRE 507 Advanced Seminar in Corporate-Finance Theory Not offered 1985–86.]

NRE 508 Advanced Seminar in Operations Management
NRE 509 Advanced Seminar in Organizational Behavior
NRE 510 Applied Economics Workshop
NRE 511 Research Seminar
NRE 512 Accounting Workshop
NRE 514 Advanced Seminar in Economics

Faculty Roster

Abolafia, Mitchell, Ph.D., SUNY at Stony Brook. Asst. Prof., Organizational Behavior
Battistella, Roger M., Ph.D., U. of Michigan. Prof., Medical Care Organization
Ben-Daniel, 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
Bugliari, 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
Cryckman, Thomas R., Ph.D., U. of Michigan. Ann Whitney Olin Professor of Accounting, Accounting
Elliott, John A., Ph.D., Cornell U. Asst. Prof., Accounting
Flash, Edward S., Jr., Ph.D., Cornell U. Assoc. Prof., Public Management
Hass, Jerome E., Ph.D., Carnegie-Mellon U. Prof., Managerial Economics and Finance
Hilton, Ronald W., Ph.D., Ohio State U. Assoc. Prof., Accounting
Jarow, Robert A., Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Finance
Krackhardt, David, Ph.D., U. of California at Irvine. Asst. Prof., Organizational Behavior
Lind, Robert C., Ph.D., Stanford U. Prof., Business Law
Mcdonald, Alan K., Ph.D., Stanford U. Assoc. Prof., Managerial Economics
McClain, John O., Ph.D., Yale U. Prof., Quantitative Analysis
Morse, Dale, Ph.D., Stanford U. Assoc. Prof., Accounting
O'Hara, Maureen, Ph.D., Northwestern U. Assoc. Prof., Finance
Orfield, George S., Ph.D., U. of Pennsylvania. Prof., Economics and Finance
Orman, Levent, Ph.D., Northwestern U. Assoc. Prof., Information Systems
Pempel, T. J., Ph.D., Columbia U. Visiting Prof., Political Economy
Pempel, T. J., Ph.D., Columbia U. Visiting Prof., Government
Pempel, T. J., Ph.D., Columbia U. Visiting Prof., Government
Shanteau, James, Ph.D., U. of California at San Diego. Visiting Prof., Marketing
Sniezek, Janet A., Ph.D., Purdue U. Visiting Asst. Prof., Organizational Behavior
Vanhorenacker, Wilfried R., Ph.D., Purdue U. Visiting Prof., Marketing

Lebow, Richard N., Ph.D., City U. of New York. Prof., Government
Lowi, Theodore J., Ph.D., Yale U. John L. Senior Professor of American Institutions, Government
Pempel, T. J., Ph.D., Columbia U. Prof., Government
Shanteau, James, Ph.D., U. of California at San Diego. Visiting Prof., Marketing
Sniezek, Janet A., Ph.D., Purdue U. Visiting Asst. Prof., Organizational Behavior
Vanhorenacker, Wilfried R., Ph.D., Purdue U. Visiting Assoc. Prof., Marketing

Lecturers

Pike, Alan, M.A., Cornell U. Lect., Management Communication
Rosen, Charlotte Ph.D., Cornell U. Lect. Coordinator, Management Communication

Adjunct and Visiting Faculty

Lakonishok, Josef, Ph.D., Cornell U. Visiting Prof., Finance

Adjunct and Visiting Faculty

Lakonishok, Josef, Ph.D., Cornell U. Visiting Prof., Finance
Division of Nutritional Sciences

Administration

Maiden C. Nesheim, director
Marjorie M. Devine, associate director for academic affairs
Lemuel D. Wright, graduate faculty representative, Field of Nutrition
Mary Morrison, 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 advisor 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-advisor conferences are required at least twice a year. The advisor 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 500, 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 course work.

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 physiochemical 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 dietetics, food service, 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 a broad interest in the scientific bases of nutritional and food sciences. It offers opportunity to plan concentration of various courses to meet specific career goals. The program of lectures and laboratories in biochemistry, physiology, and microbiology provides a basis for advanced study in either human nutrition or food.

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.

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
Nutritional Sciences

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 Mary A. Moynihan, honors chairperson, N-205A Martha Van Rensselaer 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; NS 331, Nutritional Aspects of Raw and Processed Foods; 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 facility 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 to 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.

Nutritional Sciences 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 combine academic study and research on nutrition, in national and international contexts. 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 a knowledge of 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.)

222 Maternal and Child Nutrition Spring. 3 credits. Prerequisites: NS 115 and a college biology course. S-U grades optional. M W F 11:15-12:05; F 12:20-4; field trips to nearby counties are arranged. Staff.

231 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. M W F 10-12; M. C. Neshie, T. C. Campbell. 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 16 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). Last, M W 1:25–4 or T R 1:25–4.

J. Segler.

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.


An examination of selected consumer issues related to the availability, safety, and quality of food. Current - legislative and regulatory proposals will be investigated in terms of relevant research and potential impact on consumers and the food supply.]


A review of major patterns of physical growth from the fetal period through adolescence, with consideration of biological and socioenvironmental 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 (normal and atypical).]

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 essential. S-U grades optional.

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 psychoses, and effects of nutrition on human behavior.

378 Management Principles in Foodservice Operation Spring. 4 credits. Prerequisites: NS 246 and Agricultural Economics 220, or Hotel Administration 211 or Industrial and Labor Relations 121, or 151 or equivalent, or permission of instructor. S-U grades optional.

T R 10–12:05. R. Holmes.

Application of management principles to foodservice operations involved in the production, distribution, and service of quality food in quantity. Includes menu planning, foodservice layout and design, production and service controls, purchasing, food-cost control, personnel management, sanitation, and safety.

398 Honors in Nutritional Sciences Fall. 1 credit. Limited to students admitted to the division honors program. S-U grades only.


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 group of students 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 associate 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 forms to the associate director for academic affairs as early as possible.

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 assisting faculty with instruction.

415 Field-based Learning in Nutrition Spring or summer. 2–6 credits. S-U grades optional.

Prerequisites: junior or senior graduate standing; 9 hours of course work in DNS; participation in field activities and a training workshop; and permission of instructor. Obtain 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. Placements are individually designed to enable students to apply nutrition concepts learned in the classroom. A biweekly seminar provides a basis for sharing 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 F. B. V. Ultermohlen.

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 353 (or equivalent background in either course), 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.


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-project component of this course may involve off-campus activity; students are responsible for their own transportation or bus fare.


Study of human nutrition and health problems from a community perspective; programs and policies related to nutrition at local, state, and federal levels; and approaches and techniques of effective application and dissemination of nutrition knowledge in communities.

446 Physicochemical 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.

447 Physicochemical Aspects of Food—Laboratory Fall. 1 credit. Limited to 16 students. Prerequisite: NS 446 or concurrent registration. S-U grades optional.


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.

448 Physicochemical Aspects of Food—Laboratory Fall. 1 credit. Limited to 16 students. Prerequisite: NS 446 or concurrent registration. S-U grades optional.


Laboratory experiments designed to illustrate (a) the physicochemical behavior of colloidal systems, (b) chemical reactions of some food components, and (c) effects of temperature, pH, moisture, inorganic salts, and enzymes on physicochemical changes in natural foods, food components, and food mixtures.


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 problems.

457 National and International Food Economics Spring. 3 credits. Prerequisites: 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 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 areas; process of economic and social development.
354 Nutritional Sciences

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. Lect. T 8:55-11:55, lab 1 sec, M T W R or F 1:30-6, J. M. L. Koch. 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 495 concurrently. T 2:30-4, M. Morrison, coordinator. Informal presentation and discussion of current topics in food and nutrition in which all members participate. Written reports on topics discussed may be requested. Determination of honors research problems in consultation with faculty adviser.

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; M. Morrison, 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 optional. 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 Acids in Nutrition (also Animal Science 601) Fall. 3 credits. Offered alternate years. W F 10:10, R. E. Austic, M. A. Morrison. Amino acid and protein nutrition, with emphasis on the dynamic aspects of protein digestion and amino acid absorption, protein and amino acid metabolism, nutrient relationships, assessment of protein quality, amino acid availability, and amino acid requirements in humans, other monogastrics, and ruminants.

602 Lipids Fall. 2 credits. W F 10:10, A. Bensadoun. 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 lipoprotein and fatty acid synthesis; and cholesterol metabolism and atherosclerosis.

604 The Vitamins Fall. 2 credits. T R 10: 2, 6 G. F. Combs, Jr. Lectures on nutritional aspects of the vitamins, including recent developments in nutritional and biochemical interrelationships with other nutrients and metabolites.

606 Carbohydrate Chemistry Spring. 2 credits. Prerequisite: organic chemistry. Recommended: biochemistry. S-U grades optional. T R 11:15, B. A. Lewis. The chemistry and physiochemical properties of simple carbohydrates, polysaccharides, and their complexes with lipids, proteins, and inorganic ions. The functional role of the carbohydrates in food systems and their nutritional implications will be discussed, as well as applications of carbohydrates in food processing.

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. A study of fundamental biochemical mechanisms of absorption, transport, metabolism, and excretion of drugs, carcinogens, and toxicants. Emphasis on oxidative and conjugative pathways of metabolism and of environmental and nutritional factors that influence toxicant metabolism and disposition. Methods of evaluating in vivo and in vitro metabolism.

612 Methods of Assessing Physical Growth in Children Spring. 2 credits. Limited to graduate students and students who have permission of the instructor. S-U grades optional. Lect. T 11:25, labs R 1:25–4:25, disc. T 12:15–3:05, J. Haas. A laboratory course to train students in methods and techniques used to assess the physical growth and development of children. The methods explored are those applicable for field or community studies and cover anthropometry, body composition, skeletal age, maturity indicators, physical fitness, and energy expenditure.

613 Obesity and the Regulation of Body Weight (also Psychology 613) 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 1 13:00–3:00. 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, obesity 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. M T W R 9:25–10:25, J. Haas. Reading course to selected topics in the current literature. Emphasis on experimental data and basic scientific principles underlying modern theory 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. W 7:30–9:30 p.m. D. Sanjur. 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.

518 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. The aspects 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 lectures. Lectures on current research in nutrition.

626 Special Topics in Food Fall. 2 credits. Hours to be arranged. G. Armbruster, 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 Fall. 2 credits. Prerequisite: organic chemistry Recommended: biochemistry. S-U grades optional. May be repeated for credit with permission of instructor. W 7:30–9:30 p.m. N. Monds. 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. T R 12:30–3:30, S–T 12:30–3:30, 631–633. T R 2:15–5:15, 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 Fall. weeks 1–3. 1 credit. Prerequisites: NS 331 or equivalent and permission of instructor. T R 2:30–5:30, S–T 9:00–12:00, 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: and NS 331 or equivalent, and permission of instructor. T R 2–6–5–15, D. Sanjur. 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; NS 332 or Biological Sciences 430; and permission of instructor. T R 2:15–5:15, V. Utermohlen and division faculty. Study of methods and techniques for clinical assessment of nutritional status and diagnosis of nutritional disorders.

633 Biochemical Assessment Spring. weeks 9–14. Interested students must enroll with the instructor during the first 2 weeks of the term. 2 credits. Prerequisites: NS 330, Biological Sciences 330 or 331, NS 332, or Biological Sciences 430, a course in human physiology, and permission of instructor. T R 2:15–5:15, Division faculty. Biochemical assessment of nutritional status. Experiments are selected to exemplify measurements of intake, use, and output of primary nutrients and their metabolites.
634 Vitamins and Coenzymes (also Biological Sciences 633) Spring. 2 credits. Prerequisites: organic chemistry 253 or 357–358 and Biological Sciences 331 or 330, or their equivalents in biochemistry. Offered alternate years.
T R 10:10. M. N. Kazazian
The chemical, biochemical, and nutritional aspects of the vitamins and coenzymes.

635 Mechanisms of Metabolic Regulation (also Biological Sciences 635) Spring. 2 credits. Prerequisites: Chemistry 358 or 360 and either Biological Sciences 330 or 331 or permission of instructor.
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.
M W F 9:05. W. J. Aron
The elements and dynamics of energy metabolism in higher animals are systematically developed through biochemical characterization 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 context of selected physiologic and pathologic stresses.

637 Epidemiology of Nutrition Spring. 3 credits. Limited to graduate students.
Lec, T R 12:20; sem, hours to be arranged. Staff.
Limited to graduate students. Allows students to gain an understanding of methodology for studying nutrition and health for making decisions, indicators of nutrition and health status, nutritional epidemiology, and surveillance, with emphasis on its relation to planning decision 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 or equivalent and NS 331 or equivalent. Not offered 1985–86.
Hours to be arranged. J. P. Habicht, J. B. Mason
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 individuals, indicators of nutritional status in populations, and design of nutritional evaluations. Teaches principles of using nutritional information for decision making.

645 Seminar on United States Nutritional Services and Programs Spring. 2 credits. Limited to graduate students. Prerequisites: Statistics and Biometry 602 or 604 or equivalent and NS 331 or equivalent. Not offered 1985–86.
Lec. T R 12:20; sem. hours to be arranged. Staff.
Participants attend two NS 445 lectures and a seminar hour where they are guided in the study and discussion of United States food and nutrition programs and community settings for delivery of nutrition and health services. Participants will be responsible for preparing and presenting relevant material in class.

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 an introduction to chemistry or biochemistry. 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 Rhacia 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 a major 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 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 years. 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. Student presentations are made in class. Limited field experience is offered.

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 overview of the toxicity of a wide variety of xenobiotics, including natural food toxicants, food additives, water pollutants, pesticide residues, and radioactive wastes, as well as medications and illegal drugs. A factual and scientifically balanced and developed so students can interpret information and misinformation circulated in the news media.

652 Nutrition Counseling Spring. 2 credits. Limited to 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, small group and individual 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. Not offered 1985–86; next offered 1986–87.
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. Includes information on methodologies of mineral research and the chemistry of ions and complexes, as well as essentiality, requirements, transport, function, homeostasis, interrelationship, and toxicity of various mineral elements.

660 Special Topics in Nutrition Fall or spring. 3 credits maximum 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. Topics may be changed so that the course may be repeated for credit.

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.
W. Uttermohlen, 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 331, 442, 652, 630, 631, 632, and 633. S-U grades only.
Full-time study at off-campus clinical sites. R. Holmes, W. Uttermohlen
The course provides clinical nutrition care in hospitals, outpatient clinics, and community settings.

680 International Nutrition Problems, Policy, and Programs Fall. 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.

681 Nutritional and Public Health Importance of Human Parasitic Infections Fall. 2 credits. Prerequisites: graduate student status or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985–86; next offered 1986–87.
M 1–2:30 L. J. Stephens
Reviews the scientific evidence for relationships between human nutritional status and common human parasitic infections. Concentrates on malnutrition (protein-energy malnutrition, anemia) in developing countries. Parasitic infections emphasized are malaria, hookworm, ascaris, schistosomiasis, and gastroenteritis. Format is lecture-demonstration-laboratory.

682 Isotope Kinetics (also Biological Sciences 752) Spring. 2 credits. Prerequisite: calculus. S-U grades only. Offered alternate years. Not offered 1985–86; next offered 1986–87.
T 7:30–9:30 p.m. D. Zilversmit
Quantitative analysis of the transport and distribution of nutrients, metabolites, and drugs in multicellular systems. The material will be presented as lectures, discussion groups, and assignments.

690 Seminar on Nutrition and Behavior (also Psychology 690) Spring. 3 credits. Prerequisite: a course in psychology, NS 361, and permission of instructor. S-U grades optional. Offered alternate years. Not offered 1985–86; next offered 1986–87.
T R 1:30–3 D. Levitsky
The 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.]

695 Seminar in International Nutrition and Development Policy Spring. 2 credits. Prerequisite: NS 680 or equivalent. S-U grades optional. T 10-11:50 M. Lalathom and international nutrition faculty. Consideration is given to the role of nutrition in national development. Emphasis is placed on programs and policy designed to reduce malnutrition and to solve nutrition-related problems in low-income countries and communities. Attention is given to the interdisciplinary nature of strategies designed to improve the nutritional status of populations. Where possible, examples from experience in different countries are used.

699 Special Topics in International Nutrition Fall and spring. 3 credits maximum each term. Registration by permission of the instructor. International nutrition faculty. This option is designed for the graduate student who wants to become familiar with some specific topic related to international nutrition. The instruction usually consists of individual tutorial study involving extensive use of existing literature. In certain semesters it may consist of a lecture or seminar course on a subject such as nutrition and parasitology or the nutritional problems of some geographic region. On occasion it may involve laboratory or field studies. Because the topics may change, this course may be repeated for credit.

700 Special Topics in Toxicology (also Toxicology 702) 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 Sciences/Physiology
Bisogni, Carole, Ph.D., Cornell U. Assoc. Prof.
Brink, Muriel S., M.S., Michigan State U. Assoc. Prof.
Campbell, T. Cossin, Ph.D., Cornell U. Prof.
Cowell, Catherine, M.S., U. of Connecticut. Adjunct Prof.
Davinci, 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
Kazandjian, 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, Bertha A., Ph.D., U. of Minnesota. Assoc. Prof.
Mondy, Neil L., Ph.D., Cornell U. Prof.
Morison, Mary A., Ph.D., U. of Wisconsin. Prof.
Nesheim, Maureen 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.
Sanjar, Diva M., Ph.D., Cornell U. Prof.
Stephenson, Lani, Ph.D., Cornell U. Visiting Asst. Prof.
Stapanik, 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, Lenuel 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

Aggar, B. Jean, Visiting Asst. Prof., U. S. Plant, Soil, and Nutrition Laboratory/Nutritional Sciences
Austic, Richard E., Assoc. Prof., Poultry Science/Nutritional Sciences
Bauman, Dale, Assoc. Prof., Animal Science/Nutritional Sciences
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
Warner, Richard G., Prof., Animal Science/Nutritional Sciences
Wasserman, Robert H., Prof., New York State College of Veterinary Medicine/Nutritional Sciences
Officer Education

Colonel John M. Kubiak, United States Air Force, Professor of Aerospace Studies and Commanding Officer, United States Air Force ROTC Detachment

Military instruction began at Cornell University in 1866 under the provisions of the Morrill Act of 1862. Since that time, officer education has been highlighted by the construction of Barton Hall in 1914, establishment of a formal Reserve Officers Training Corps (ROTC) unit in 1916, and the evolution of a program that deemphasizes drill and formations and places greater stress on the development of leadership and managerial skills.

Throughout the years Cornell's program of officer education has provided many outstanding civilian and military leaders well equipped for success as a result of knowledge and skills gained from their involvement in the Officer Education Program while pursuing undergraduate and graduate degrees.

The programs of officer education allow the student to prepare for a commission as an officer in either the United States Army Reserve or the United States Air Force. Each service program is headed by a senior military officer who also serves as a full professor on the Cornell faculty.

Military Science

Lieutenant Colonel Clarence R. Buchwald, Field Artillery, United States Army, Professor of Military Science and Commanding Officer, U.S. Army ROTC Detachment

Major Michael J. Amidie, Quartermaster, 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

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 reserve and active components of the United States Army. Intermediate objectives are to provide students with an understanding of the fundamentals of responsibility, integrity, and 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 enrich the student and his or her adviser after initial enrollment.

The Army ROTC Program is designed to promote personal development and 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 I and 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, the evolution of warfare, and the nature of armed conflict in society.

Students also participate in leadership modules that include rappelling, orienteering, drill and ceremony, physical training, and winter survival. 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 48½ program-related hours.

During the fall of the second year, the student takes a three-credit class in military history. In the spring, the student takes a one-credit course in map reading and spends approximately two hours a week in practical leadership training as preparation for the Advanced Phase.

Advanced Phase (Mil I and II)

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 any other degree-granting institution. Applications are accepted from December to April. Selectees complete the basic six-week summer officer education program before registering in the Advanced Phase the following fall. They must also meet specific 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, all 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 cadet scholarship and non-scholarship students 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 three more years on 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 will be on active duty. Current trends indicate that requests for active duty for three years by non-scholarship, non- Regular Army
Officer Education

The United States Army force is studied to provide a framework for subsequent magnitude of operating the defense organization are. Students examine the United States defense apparatus—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 ten 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 and from camp. Uniforms, textbooks, and supplies required for AROC 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 or a module or both 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 courses as noted below. Students in the Two-Year Program are required to take all of the courses listed for the junior and senior year.

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 develop, interpret, and use maps in terrain association and land navigation. Knowledge of topography is complemented by an orientation on significant environmental influences from political, social, and climatic factors. Portions of the course provide practical experience in land navigation and orienteering.

Junior Year (Mil S III)

Mil S 322 Theory and Dynamics of the Military Team
Fall: 2 credits. Required.
Staff.
After 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 322 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 II
Fall: 2 credits. Required.
Staff.
A detailed examination of the functions and activities of military organizations, their commanders, and their staff. Discussion focuses on students' past experiences and future expectations in examining such aspects of the military environment as the chain of command, decision making, command and staff relationships, and the various elements of small-unit administration.

Mil S 481 Contemporary Military Environment II
Spring: 2 credits. Required.
Staff.
As a continuation of the material presented in Mil S 424, students examine carefully the leadership environment of an Army officer. Conferences and seminars are used to examine the techniques of effective military leadership, the sociological and psychological environment, the nature of military law, and above all, the professional ethics, responsibilities, and obligations of an Army officer.

Practical Leadership Training

All Army Officer-Education Students

All Advanced Phase AROC students and Basic Phase students for physical to a cadet organization for the purpose of participation in practical leadership experiences. The cadet organization meets formally for 1½ hours each week as part of the leadership laboratory program. The rationale for the form and content of the program is the fact that continued exposure to leadership situations that are both mentally and physically challenging will develop poise and self-confidence. The practical result for the individual participant is the ability to apply intelligently and creatively the decision-making process to a variety of complex situations and simultaneously supervising the performance of others.

Training of this nature enables students to learn how to communicate effectively with peers, subordinates, and superiors. Most importantly, the program helps instill in the participant a heightened awareness of the roles that character traits such as integrity, cooperation, devotion to duty, and professionalism play in the smooth operation of any organization.

In the leadership laboratory, all of these objectives are accomplished by emphasizing practical exercises and firsthand experience. These practical laboratory activities include an introduction to rifle marksmanship, mountaineering, physical training, land navigation and orienteering, signal communications, tactics, and orienteering and training exercises at military installations.

As with many laboratory periods, no credit is given, and participation is required for successful completion of the AROC program. Students register as follows:

Mil S I Leadership Laboratory I
Fall: Spring
Mil S 141 Mil S 142
Mil S I cadre 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
Not offered Mil S 242
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
Cadets meet for 1½ 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.
Corps. At Cornell University over 90 percent of naval
Successful completion of the Scholarship Program
The Naval Officer Education Program provides six
The program provides uniforms, full tuition, most
earned.
There are two types of Navy programs: the Scholarship (
commissioned, may be granted on an individual basis
on June 30 of the calendar year in which
entering year and be less than twenty-five years of age
An applicant for Naval ROTC at Cornell must be a
least one summer-at-sea period.
There are two College Programs available. Both lead to
a commission in the Naval or Marine Corps Reserve
and three years of active duty.
Each of these programs provides textbooks for naval
professions courses, uniforms, and a subsistence
allowance of $100 a month from the beginning of the
junior year.
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.
College Program students attend at least one summer
training session of the same duration between the
junior and senior years. While attending summer
training sessions, midshipmen are paid approximately
$500 a month.
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
(seamen recruit) before being appointed midshipman,
USNR, and receiving compensation. Students that are
enrolled from the NROTC Navy-Marine Corps
Scholarship Program for reasons beyond their control
shall, upon disenrollment, be discharged from their
enlisted status. It should be understood that two years
active enlisted service or restitution of benefits received
will be required of those students who default from the
terms of their NROTC contract after the beginning of
their sophomore year. Additionally, two years active
enlisted service is incurred at any time for those
individuals who are released from active duty
specifically to participate in the NROTC scholarship
program and do not complete such training.
Officers commissioned in the Regular Navy or Marine
Corps serve on active duty for a minimum of four years.
Those commissioned in the Naval or Marine Corps
Reserve serve three years on active duty. Specialized
training following commissioning adds additional active
duty requirements in some cases.
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, where
they will undergo six weeks of intensive training. Upon
commissioning the following year as second
lieutenants, they will be assigned to the Basic School at
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 on 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.

Navy Professional Laboratories

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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, where
they will undergo six weeks of intensive training. Upon
commissioning the following year as second
lieutenants, they will be assigned to the Basic School at
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 on 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, Pensaco
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 interaction. Basic principles of thermodynamics, propulsion, mechanical 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. Includes in-service sailing skills and safety principles. Students sail small and large boats on Cayuga Lake, weather permitting. Focus is U.S. Navy Class B irishore 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 8. 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 formal derivation of the fire-control problem and specific U.S. Naval 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. Emphasis is on the relationship 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 321 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 weapons 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.

Nav S 305 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.

Senior Year (Navy)

Nav S 431 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 members or 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 432 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 302 Armed Conflict and Society Fall. 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.

Junior or Senior Year (Marines)

Nav S 311 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

Navy 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. Study in engineering and scientific fields is required for a majority of Navy-option scholarship students. Other 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. Academic majors in fields that show a career interest apparently antithetical to a career in the unrestricted line (for example, agronomy, art, floriculture, music, physical education, premedical studies, theology, or wildlife management) are precluded for Navy-option scholarship students. Because of changing terminology for academic fields of study, it is not practical to provide a complete list of authorized and unauthorized majors. 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

management
mathematics
oceanography
operations analysis
physical sciences

European studies
foreign affairs
history
Latin American studies

physics
public administration
Soviet studies

Although there are few restrictions placed upon Navy-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 compete 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 Navy-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 in any academic major is eligible for a commission in the United States Marine Corps or United States Marine Corps Reserve. Marine-option students take the same naval science 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 courses (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 chosen 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 and 112 or 122. Calculus
Math 191, 192, or 194. Calculus for Engineers
Chem 207-208 General Chemistry
Chem 103-104 Introduction to Chemistry
Chem 207-208 General Chemistry
H Adm 171-172 Food Chemistry
Computer Science
Engr 105 Introduction to Computer Programming
CS 101 The Computer
CS 102 Introduction to FORTRAN programming
CS 211 Computers and Programming
CS 314 Introduction to Computer Systems and Organization
M&AE 389 Computer-aided Design
CS 406 Introduction to Computers in Planning
H Adm 114 Information Systems I
Ag En 151 Introduction to Agricultural Engineering and Computing
Ag En 152 Engineering Drawing
IS&LR 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, midshipmen sail aboard the unit sail-landing vessel Alliance to distant ports of call. Back at Cayuga Lake, a highly respected sail-training program offers instruction, both in small sailboats and in large-boat sailing on board Alliance, to all who want to participate. The unit offers a comprehensive sports program in which most midshipmen participate. The Navy unit has won the Independent Division All-Sports Trophy for seven of the last eight years. Midshipmen participate in a myriad of social events, including the annual Navy ball, the Tri-Service military ball, and traditional naval mess nights.

Department of Aerospace Studies
Colonel John M. Kubiak, United States Air Force, Professor of Aerospace Studies and Commander, Air Force ROTC Detachment 520
Major Paul D. Decker, United States Air Force
Captain Harold L. Reem, United States Air Force
Captain Cheryl R. Andrews, United States Air Force
Capitán Mark E. Mielke, United States Air Force

The objective of the Aerospace Officer Education Program at Cornell is to prepare men and women for positions as officers in the United States Air Force. The program is designed to provide the student with a background of aerospace knowledge and to further develop qualities of leadership, integrity, and self-discipline. The objectives are achieved through four-year and two-year programs. These programs include specific courses in aerospace studies and practical laboratories.

Applicants who are interested in flying (as pilot or navigator) or missile duty should make that request known at the time they enter the program. All applicants receive physical examinations at no cost and, to be accepted, must meet the physical requirements listed below.

Though the program is designed to prepare future Air Force officers, Department of Aerospace Studies courses are open to all students at Cornell.

Physical Requirements
Every applicant must be free from any limiting physical infirmity and must have normal hearing, blood pressure, and heartbeat. Weight must be normal for height and age.

Following are the additional specific requirements for nonflying categories.

Vision: bilateral distant vision without corrective lenses, at least 20/400.

Height: for men, at least sixty but not more than eighty inches; for women, at least fifty-eight but not more than seventy-two inches.

Allergy: no history of asthma since twelfth birthday.

Dental health: good.

Those students who are interested in qualifying for flying categories (pilot or navigator) must meet the following specific requirements.

Vision: (for pilot candidates) 20/20 bilateral near and far vision without corrective lenses; (for navigator candidates) bilateral near vision at least 20/20 without corrective lenses and bilateral far vision at least 20/15 without correction, providing it is correctible to 20/20 with lenses.

Color vision: normal.

Height: at least sixty-four but not more than seventy-six inches; sitting height not more than thirty-nine inches.

Allergy: no history of allergy or hay fever since twelfth birthday.

Dental health: good.

Four-Year Program
The Four-Year Program is open to all freshmen. Sophomores may enter the program but require departmental approval. Students in a five-year degree program may enroll in their freshman or sophomore year.

Veterans of the United States armed forces and students entering the program from military schools may receive advanced standing, subject to approval by the professor of aerospace studies.

The Four-Year Program consists of the General Military Course (GMC) and the Professional Officer Course (POC). The first year of the GMC carries no military commitment, and any students may withdraw at any time during that period. In the second year, non-scholarship students do not incur military commitment and may withdraw at any time during that year.

General Military Course
Students in the GMC take one credit of classroom work offered by the Department of Aerospace Studies each semester. During the freshman year the student examines the organization and mission of the United States Air Force and the role United States military forces in the contemporary world. In the sophomore year the student studies the history and development of military aviation and American air power. In both years we emphasize officership, professionalism, and human rights within the United States Air Force.

Students also spend 15 hours a week in a leadership laboratory, which includes classroom instruction in responsibilities and the environment of the junior officer and instruction and practice in basic drill and ceremonies. In addition, all students participate in summer field training for four weeks between their sophomore and junior years.

Two-Year Program
The Two-Year Program consists of the last two years (the Professional Officer Course) of the regular Four-Year Program plus a six-week summer training course preceding enrollment. (Details of the Professional Officer Course are given above.)

The Two-Year Program is open to male and female students with two years of academic study 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. Selectees are then required to 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 3%, 2%, and 2% 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%, 3%, and 3% are limited to majors in engineering, physics, mathematics, computer science, and meteorology. A limited number of four-year scholarships are available to those enrolled in non-military academic majors such as business administration, accounting, and management. Some two- and three-year scholarships are awarded to students in non-aeronautical academic majors who desire to become navigators or missile launch officers. A scholarship cadet receives a $1000-a-month, tax-free subsistence allowance, all tuition, fees, and reimbursement 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, tax-free 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 are provided. Department of Aerospace Studies courses are provided.

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Professional Officer Course
The Professional Officer Course is a two-year advanced course of instruction. Students who are accepted for the POC must have successfully completed or validated the basic course and must meet the academic and physical standards. Each cadet accepted into the POC must sign an agreement to complete the program and accept, if tendered, a commission in the Air Force Reserve upon graduation.

Classroom study in the POC requires three hours a week each semester. In the junior year, cadets study Air Force leadership and management at the junior officer level. During the senior year cadets study the elements of national security and the place of the military in American society. Less than two hours a week. A minimum of one hour a week in the junior and senior years. In the leadership laboratory the cadet is exposed to advanced leadership experiences and applies principles of management learned in the classroom.
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 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 the field and their families. The six-week field training program differs in that it has an 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 emergency 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 field training, airborne training (parachute jumping instruction) is available as 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 their senior 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, and other professional degree programs are assigned to areas of the Air Force that are best suited to their educational backgrounds. Students will work under the supervision of some of the most highly qualified people in their field and have 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. All cadets in the option school will be assigned to one of the operational missile bases as a crew member. This type of assignment provides an opportunity for a young officer to obtain command experience and also enjoy the extra option of enrolling in a graduate program.

Those officers graduating in the general service category can anticipate assignments in manpower management, administration, logistics, police, and investigation, intelligence, personnel, transportation, information, and numerous other career fields. They will use their educational backgrounds in positions of responsibility and be given the opportunity to develop further their managerial and administrative skills.

Service Obligations

Second lieutenants commissioned in nonflying categories are required to serve on active duty for four years. Pilot trainees are required to serve on active duty for six years after completing flying training and receiving their aeronautical rating. Navigator trainees will serve on active duty for five years after receiving their aeronautical rating. Some newly commissioned officers are allowed to postpone their active service in order to remain in college and earn advanced degrees.

Curriculum

Students in the Four-Year Program are required to take all of 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. Mielke.

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. Mielke.

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 aviation in the United States, 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 national and international relief missions is discussed. The role of air power in the Korean conflict, the Cuban crisis, and the Vietnam War are examined from the viewpoint of technology and tactical doctrine.

Junior Year

Air S 331 Leadership and Communicating 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, are emphasized. Leadership research and theory. Recent approaches to leadership models and the importance of communication skills. Leadership factors 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 officer level. Basic concepts of management and decision making, including planning, organizing, coordinating, directing, and controlling. Evaluation processes and techniques used by management are studied. Position of management in the total society and its effect on power and politics, 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 guest lecturers primarily from government and industry departments. A study of modern warfare that examines the relationship of military and political factors, 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 process, reasoning in public affairs, and value orientations associated with professional military service are examined. Changes within the military are analyzed, including such topics as the all-volunteer force, 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

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 141–142 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 career areas 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  Precommissioning 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

Administration

Laing E. Kennedy, director of physical education and athletics
Alan E. Gantert, associate director of athletics and director of physical education and intramurals
John R. West, assistant director of physical education
Barbara Alling, secretary
Patricia Russell, secretary
Leanna Morgan, secretary

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 aquatics depths of scuba diving 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 announcement serves only as a guide. Dates, fees, and regulations stated herein are subject to change at any time. Students should feel free to check any information 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 cannot pass the swim 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 each semester 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 gymnarium during the academic course registration period. Dates and times are published 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 physical education 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. In general, such changes will be allowed only if the student has a conflict caused by a change in his or her academic course 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 Bartlett Hall, students register at the registration desk of Teagle Hall (across Garden Avenue from Bartlett 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 personal 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.

Note: Members of intercollegiate teams who need physical education credit must appear at each physical education course registration in the Teagle gym to report that they are meeting their requirement through team participation. If for any reason they are dropped from the team roster, they must go immediately to the physical education office in Teagle Hall and enroll in a course.

Persons registering as noncredit students go directly to the course tables and fill out their course materials. They do not go to the card file if they are not involved with the two-semester requirement.

Course Fees

Information about fees associated with physical education courses is available at the time of course registration (some fees cannot be set until the course meets). Course fees are not charged to the account of a student enrolled in the University until three weeks after course registration. All fees thus charged are billed through the bursar’s office. Other participants in courses involving fees usually must pay when they register. Only the person paying the fee will be allowed to use the playing time allotted by the fee. Payment will be waived or refunded only if:

1. the participant withdraws from the course during the designated drop-add period (the withdrawal must be made at the physical education office in Teagle Hall);
2. the participant fails to pass preliminary course requirements; or
3. the participant accumulates a significant number of medically excused absences from the course (the director or assistant director of the physical education program will make the decision in this situation).

Note: All fees charged for the Greek Peak ski program are subject to the regulations of the Greek Peak ski center. Students should refer to the information sheet supplied by Greek Peak at spring registration.

Credit

Physical education credit is granted for:

1. satisfactory completion of a course offered through the physical education program;
2. participation on an intercollegiate team as a competitor or manager;
3. participation in the marching band;
4. 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 one course only 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 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 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.
Use of Facilities and Equipment

In the event conflict arises about 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 combination lock. Baskets for men and women are available at Teagle Hall and are assigned to new students during academic registration. Students should pick up their combination lock when reporting for their swim test. 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 receives 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 may rent a solid-color gym uniform for use during the term from the locker-room staff at Teagle Hall. Uniform rental at Helen Newman Hall is limited to women’s swimsuits.

Students are allowed to borrow small equipment items, such as basketballs, volleyballs, 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 seven days during the early fall or late spring. A deposit is required.

Faculty-Staff Use of Facilities

Faculty and staff members may purchase an annual fee to obtain a privilege card for use at both Teagle Hall and Helen Newman Hall. The card may be purchased at the main office in either hall (Teagle, telephone: 256-4286; Helen Newman, telephone: 256-5133). It entitles the holder to a uniform service, a towel service, a basket and padlock (at the issuing hall only), and use of all facilities at both halls. Card holders may also participate on a space-available basis in any "elective education course for a reduced fee (see "Elective 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 memberships can use the Helen Newman pool (by paying an hourly fee) or the Teagle pools during designated hours. Specific times are established each term for single-sex coed swimming and for family swim nights. Schedules for the use of the pools are available in the main office of Teagle and Helen Newman halls.

Women using the Teagle pools must supply their own swimsuits and caps (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 and caps (required).

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 Announcement 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 Teagle Hall.

Fundamental shots, scoring, and general play.

Basketball

Fall and spring.

Two classes a week, Barton Hall.

Fundamental drills in passing, shooting, and dribbling.

Squash racquets and team play.

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, Oxley 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 Teagle 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 fundamentals 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.

Nautilmus

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 turn stations in the room.

Racket Games

Fall and spring.

Two classes a week, Teagle Hall.

Table tennis, racquetball, squash, badminton, and racquetball.

Playing fundamentals, scoring, and rules are stressed. Intercampus competition.
Water training in Cayuga Lake. Internationally recognized American Red Cross water safety instructor certification program includes skill training in a pool and open-water equipment for pool sessions is provided: tanks, snorkel, and vest. Advanced level scuba course is open only to those who have completed the advanced open-water scuba course.

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 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.

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. 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. Two 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.

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.

Archery

Basic Archery Fall and spring. Two classes a week, Bacon Cage. Instruction in the care of equipment; seven basic steps for shooting; scoring; practicing shooting at twenty, thirty, and forty yards.

Intermediate Archery Fall and spring. Two classes a week, Bacon Cage. A review of basic archery skills; teaching progressions and correction of shooting errors are stressed, and aiming methods are introduced. The last four weeks are devoted to the New York State archery hunting certification, awarded on successful completion of the course.

Dance

Ballroom Dancing Fall and spring. Fee charged. Students and their partners must sign up at course registration. One evening class a week, Helen Newman Hall. Includes instruction in the waltz, Charleston, rumba, and tango.

Aerobic Dance Fall and spring. Fee charged. Two classes a week, Helen Newman Hall. A simple dance program designed to keep the cardiovascular system in top shape by making the body demand increased amounts of oxygen.

Dance Fall and spring. Two or three classes a week, Helen Newman Hall. Develop flexibility, coordination, and the ability to perceive and reproduce phrases of dance movement with rhythmic accuracy and clarity of body design. Auditions are required for admission to some advanced courses, since they require the mental and physical ability to perform more-complex phrases in various styles.

Elementary Ballet Intermediate Ballet Advanced Ballet Jazz Dance I Jazz Dance II Elementary Modern Dance Intermediate Modern Dance High-Intermediate Modern Dance

Advanced Modern Dance

Fencing

Fencing I 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 the equivalent. Two classes a week, Helen Newman Hall. Intersession competition is stressed. Equipment is furnished.

First Aid

Standard First Aid Fall and spring. Textbook fee charged.

Advanced First Aid Fall and spring. Fee charged. Two classes a week, Schollkopf Hall. Course leads to American Red Cross certification.

Cardiopulmonary Resuscitation (CPR) Fall and spring. No credit. Fee charged.

Recreational Golf Fall and spring. Limited to students who are experienced golfers. Fee charged. Twelve rounds of nine holes each must be played to complete the program. Moakley golf course. Students must provide their own clubs.

Gymnastics

Beginning Gymnastics Fall and spring. Two classes a week, Teagle Hall. Basic instruction in tumbling, dance for gymnastics, trampoline, and use of all apparatus.

Intermediate Gymnastics Fall and spring. Two classes a week, Teagle Hall. Beginning gymnastics or the equivalent is a prerequisite.

Jogging

Jogging Fall and spring. Fee charged. 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, Helen Newman 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 Skills

Backpacking in the Finger Lakes Region  Fall and spring. One section limited to women; all others are coed. Fee charged.
Hours to be arranged, Teagle Hall.
Class sessions lead to a full weekend on the trail in a local wilderness area.

Basic Mountaineering (Rock Craft)  Fall and spring. Fee charged for equipment and travel.
One class a week, Teagle Hall.
Basic instruction and practice in rock climbing, rappelling, knot craft, and rescue techniques.

Outdoor Leadership Training  Fall and spring. Fee charged.
Hours to be arranged, Teagle Hall.
A combination of class sessions and outings designed for the experienced outdoor person, whether backpacker, cyclist, or canoeist.

Outdoor Survival  Fall and spring. Fee charged.
Hours to be arranged, Teagle Hall.
Lectures and short outings lead to a full weekend in a local wilderness area, practicing outdoor survival skills.

Ice Climbing  Spring. Limited to experienced mountain climbers. Prerequisite: permission of instructor. Fee charged.
Hours to be arranged, Teagle Hall.
Climbing techniques for ice surfaces. Includes outings to local parks.

Intermediate Mountaineering  Spring and fall.
Prerequisite: Basic Mountaineering or the equivalent. Fee charged.
Hours to be arranged, Teagle Hall.
Saturday outings to local parks feature advanced rock-craft skills and rescue techniques.

Bicycle Touring  Fall and spring. One spring section limited to women; all others are coed. Fee charged.
Hours to be arranged, Teagle Hall.
Covers bicycle repair, physical conditioning, trip planning, and road safety. Classes lead to a weekend bicycle camping trip. Students must provide their own bicycles.

Flat-Water Canoeing  Fall and spring. Fee charged.
Hours to be arranged, Teagle Hall.
Classes and local practice sessions lead to a weekend canoe trip.

White-Water Canoeing  Spring. Fee charged for canoe rental, food, and transportation to mountains.
Hours to be arranged, Teagle Hall.
Classes and local practice sessions lead to a weekend canoeing trip on Adirondack waterways.

White-Water Kayaking  Spring. Fee charged.
Hours to be arranged, Teagle Hall.
Covers paddling techniques, water safety, river-running logistics, reading currents.

Wilderness Travel  Spring. Fee charged.
Hours to be arranged, Teagle Hall.
An intensive skills course in outdoor living. Local outings and weekends lead to a week-long trip to the Allegheny Plateau during spring break.

Hours to be arranged, Teagle Hall.
One-day outings in the Ithaca area lead to a seven-day trip to the White Mountains of New Hampshire during spring break.

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 teaches and shooting at the Tompkins County Rod and Gun Club range. Guns and shells are furnished.

Hunter Safety  Fall and spring.
Hours to be arranged, Barton Hall.
Instruction in hunter safety leads to New York State certification for bow and gun.

Sailing

Principles of Sailing  Fall and spring. Fee charged.
One class a week, Cayuga Lake.
Instruction in basic sailing skills and safety principles. Students sail small and large boats on Cayuga Lake, weather permitting.

Intermediate Sailing  Fall and spring. Fee charged.
One class a week, Cayuga Lake.
Instruction in more-advanced techniques for those already familiar with the basic principles of sailing.

Skating

Introduction to Skating  Fall and spring. For beginning to intermediate skaters. Fee charged.
Three classes a week for half a term, Lynah Rink.
Students provide their own hockey skates or rent them at Lynah Rink.

Beginning and Low-Intermediate Figure Skating  Fall and spring. Fee charged.
Three classes a week for half a term, Lynah Rink.
Instruction and practice in basic figure skating techniques: forward and backward, crossovers, turns, and spirals. Students provide their own figure skates or rent them at Lynah Rink.

Intermediate and Advanced Figure Skating  Fall and spring. Limited to experienced skaters. Fee charged.
Three classes a week for half a term, Lynah Rink.
Advanced figure skating techniques. Students provide their own figure skates or rent them at Lynah Rink.

High-Intermediate and Advanced Figure Skating  Fall and spring. Fee charged.
Advanced figure skating techniques. Students provide their own figure skates or rent them at Lynah Rink.

Introduction to Ice Hockey  Fall and spring. Fee charged.
Two classes a week, Lynah Rink.
Stick handling, passing, and shooting are stressed. Students provide their own skates and sticks; all other equipment is furnished.

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.
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 the art of 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.

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

Intermediate Volleyball  Fall and spring.
Two classes a week, Helen Newman Hall and Teagle Hall.
Passing and blocking strategy; scrammages in class.

Advanced Volleyball  Fall and spring.
Two classes a week, Helen Newman Hall.
Offensive and defensive team strategy is emphasized in class scrammages.

Yoga

Yoga I  Fall and 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
Johanne E. Davenport, director, Cornell University Conference Services
Judith K. Eger, director, Programs in Professional Education
Mary K. Glover, 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 options 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 256-4987.

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 intercession 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 256-4987.

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 256-7259.

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, 6265 Thurston Avenue, or call 256-6260.

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 256-6290.

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 256-4987.

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 1986. 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 256-4987. The 1986 Announcement of Summer Session will be published in March.

Agronomy
131 Basic Principles of Meteorology

Archaeology
107 Popular 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
133 Introductory Graphics
141 Introductory Sculpture
151 Introductory Drawing
158 Conceptual Drawing
159 Life and Still-Life Drawing
161 Introductory Photo I
168 Black-and-White Photography
169 Color Photography
261 Introductory Photo II
378 Special Topics in Art Studio
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
240 Plant Physiology
245 Plant Biology
261 General Ecology
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<td>301</td>
<td>Theory of Market Failure</td>
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<td>311</td>
<td>Intermediate Microeconomic Theory</td>
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<td>312</td>
<td>Intermediate Macroeconomic Theory</td>
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<td>313</td>
<td>Intermediate Microeconomic Theory (calculus section)</td>
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<td>314</td>
<td>Intermediate Macroeconomic Theory (calculus section)</td>
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<td>315</td>
<td>History of Economic Thought</td>
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<td>319</td>
<td>Introduction to Statistics and Probability</td>
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<td>331/531</td>
<td>Money and Credit</td>
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<tr>
<td>335</td>
<td>Public Finance: Resource Allocation and Fiscal Policy</td>
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<tr>
<td>361/561</td>
<td>International Trade Theory and Policy</td>
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<td>362/562</td>
<td>International Monetary Theory and Policy</td>
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<tr>
<td>366</td>
<td>The Economy of the Soviet Union</td>
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<td>369</td>
<td>Selected Socialist Economics: People's Republic of China</td>
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<td>383</td>
<td>Marxist Political Economy</td>
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<td>420</td>
<td>Field Experience</td>
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<td>497</td>
<td>Informal Study</td>
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<tr>
<td>547</td>
<td>Improvement of College Teaching</td>
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<td>590</td>
<td>The Education of Women: Images and Perspectives</td>
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<tr>
<td>620</td>
<td>Internship in Education</td>
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<td>600</td>
<td>Master's-Level Thesis Research</td>
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<tr>
<td>900</td>
<td>Doctoral-Level Thesis Research</td>
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<td>476</td>
<td>Microprocessor Systems</td>
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<td>108</td>
<td>Writing about Film</td>
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<td>109</td>
<td>Introduction to Rhetoric</td>
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<tr>
<td>131</td>
<td>Critical Reading and Writing</td>
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<td>133</td>
<td>Practical Rhetoric</td>
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<td>135</td>
<td>Writing from Experience</td>
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<td>137</td>
<td>Writing Workshop</td>
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<td>150</td>
<td>Poems and Stories</td>
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<td>151</td>
<td>The Modern Imagination</td>
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<td>157</td>
<td>Classic American Authors</td>
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<td>158</td>
<td>Modern American Authors</td>
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<tr>
<td>165</td>
<td>Fantasy</td>
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<tr>
<td>227</td>
<td>Shakespeare</td>
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<tr>
<td>270</td>
<td>The Reading of Fiction</td>
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<td>271</td>
<td>The Reading of Poetry</td>
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<td>273</td>
<td>Irish Culture</td>
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<td>280</td>
<td>Creative Writing</td>
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<td>288</td>
<td>Expository Writing</td>
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<td>311</td>
<td>Fantasy and Horror</td>
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<td>351</td>
<td>Modern Poetry</td>
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<td>362</td>
<td>The American Renaissance</td>
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<td>Verse Writing</td>
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<td>The Art of the Essay</td>
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<td>470</td>
<td>Studies in the Novel</td>
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<td>Children's Literature</td>
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<td>210</td>
<td>Architectural Sketching in Watercolor</td>
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<td>201</td>
<td>Introduction to French Literature</td>
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<td>333</td>
<td>Contemporary French Thought: From Existentialism to Poststructuralism</td>
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<tr>
<td>101</td>
<td>Introductory Geological Science</td>
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</tbody>
</table>
370 Summer Session, Extramural Study, and Related Programs

102 Introduction to Historical Geology
401 Summer Field Geology in Wyoming

Government
100.1 Law, Politics, and Moral Choice
100.2 Civil Liberties and the Law
100.3 Freedom and Justice in the Western Tradition
111 The Government of the United States
131 Introduction to Comparative Government and Politics
161 Introduction to Political Theory
181 Introduction to International Relations
304 Computers and Society
310 Power and Society in America
317 Political Parties and Elections
333 Government and Politics of the Soviet Union
350 Comparative Revolutions
358 Modern History of the Middle East

History
274 Foodways: A Social History of Food and Eating
363 Russian History since 1800
383 Europe in the Twentieth Century

History of Art
202 Survey of European Art: Renaissance to Modern
281 Introduction to Art History: Modern Art

Hotel Administration
161 Keyboarding-Typewriting
345 Historical Introduction to Public Hospitality Law and Its Impact on American Society

Human Development and Family Studies
115 Human Development: Infancy and Childhood
116 Human Development: Adolescence and Youth
150 The Family in Modern Society
445 Topics in Early Childhood Education and Development: Education of the Emotionally Disturbed Child

Human Service Studies
203 Groups and Organizations
315 Human Sexuality: A Biosocial Perspective
400/600 Employee Assistance Programs—Philosophy and Methods
507 Professional Improvement
529 Research Design and Analysis

Industrial and Labor Relations

660 Public Policy and Program Planning in Human Services

372 Elementary Statistics
421-422 Applicable Mathematics
451 Classical Geometries

604 Applicable Mathematics

669 Special Topics in Compensation: Pay Determination in the United States
693 Design and Administration of Training Programs
694 Personal Computer Applications in Human Resource Management and Labor Relations

Marine Science
Consult the Shoals Marine Laboratory office for a complete list of summer offerings in marine science.

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
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
203 Intermediate Composition and Conversation
Spanish
101 Spanish Basic Course I
123 Continuing Spanish
203 Intermediate Composition and Conversation

Mathematics
101 History of Mathematics
107 Finite Mathematics
109 Precalculus Mathematics
111–112 Calculus
123 Analytic Geometry and Calculus
192 Calculus for Engineers
200 Foundations of Mathematics
213 Calculus
231 Linear Algebra
294 Engineering Mathematics
336 Applicable Algebra
372 Elementary Statistics
421-422 Applicable Mathematics
451 Classical Geometries

315 History of Mathematics
333 Modern History of the Middle East
### Music
- 105 Introduction to Music Theory
- 108 Bach to Debussy
- 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
- 246 Introduction to Judaism
- 364 Introduction to Field Archaeology in Israel
- 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
- 244 Philosophy and Literature: Truth and Fiction
- 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

### 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
- 277 Psychology of Sex Roles
- 280 Introduction to Social Psychology
- 281 Interpersonal Relations and Small-Group Processes
- 325 Introductory Psychopathology
- 350 Statistics and Research Design
- 469 Psychotherapy: Its Nature and Influence

### Rural Sociology
- 437 Environment and Aging

### Sociology
- 101 Introduction to Sociology
- 202 Hard Choices
- 221 Sociology of Organizations
- 243 Family
- 252 Public Opinion
- 277 Psychology of Sex Roles
- 280 Introduction to Social Psychology
- 281 Interpersonal Relations and Small-Group Processes
- 347 Environment and Aging

### Spanish Literature
- 201 Introduction to Hispanic Literature

### Theatre Arts
- 108 Writing about Film
- 151 Production Laboratory I
- 153 Stage Management Production Laboratory
- 155 Rehearsal and Production
- 282 Introduction to Voice and Speech for Performance
- 287 Summer Acting Workshop
- 327 Modern Drama
- 377 Fundamentals of 16-mm Filmmaking

### Theoretical and Applied Mathematics
- 202 Mechanics of Solids

### Women’s Studies
- 231 Power and Marginality: Women in the Third World
- 277 Psychology of Sex Roles
New York State College of Veterinary Medicine

Administration
Charles G. Rickard, acting dean
Lennart P. Krook, associate dean for postdoctoral education
Neil L. Norcross, secretary of the college
Robert G. Brown, assistant dean for administration
John C. Semmler, assistant dean for facilities and research administration
Ann Marcham, assistant to the dean for instructional support and special projects
Ralph A. Jones, assistant to the dean for public affairs

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, Doctor of Science in Veterinary Medicine, 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
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</thead>
<tbody>
<tr>
<td>500</td>
<td>Gross Anatomy: Small Animal</td>
<td>First year</td>
</tr>
<tr>
<td>501</td>
<td>Gross Anatomy: Large Animal</td>
<td>First year</td>
</tr>
<tr>
<td>502</td>
<td>Animal Development</td>
<td>Fall</td>
</tr>
<tr>
<td>503</td>
<td>Cytology and Organology</td>
<td>Spring</td>
</tr>
<tr>
<td>504</td>
<td>Neuroanatomy and Clinical Neurology</td>
<td>First year</td>
</tr>
<tr>
<td>505</td>
<td>Applied Anatomy</td>
<td>Fall</td>
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<tr>
<td>506</td>
<td>Applied Anatomy</td>
<td>Spring</td>
</tr>
<tr>
<td>507</td>
<td>Anatomy of the Fish and Bird</td>
<td>Spring</td>
</tr>
<tr>
<td>508</td>
<td>Organology</td>
<td>First year</td>
</tr>
<tr>
<td>600</td>
<td>Special Projects in Anatomy</td>
<td>Fall and spring</td>
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</table>

Avian and Aquatic Animal Medicine

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
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</thead>
<tbody>
<tr>
<td>555</td>
<td>Avian Diseases</td>
<td>Fall</td>
</tr>
<tr>
<td>671</td>
<td>Diseases of Aquatic Animals</td>
<td>Spring</td>
</tr>
<tr>
<td>672</td>
<td>Aquavet: Introduction to Aquatic Veterinary Medicine</td>
<td>Mid-May to mid-June</td>
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<tr>
<td>770</td>
<td>Advanced Work in Avian Diseases</td>
<td>Fall and spring</td>
</tr>
<tr>
<td>772</td>
<td>Advanced Work in Aquatic Animal Diseases</td>
<td>Fall and spring</td>
</tr>
<tr>
<td>773</td>
<td>Advanced Work in Avian Immunology</td>
<td>Fall and spring</td>
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</table>

Clinical Sciences

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>475</td>
<td>Health and Diseases of Animals</td>
<td>Spring</td>
</tr>
<tr>
<td>540</td>
<td>Pathology Service</td>
<td>Fall and spring</td>
</tr>
<tr>
<td>547</td>
<td>Practice Management</td>
<td>Fall and spring</td>
</tr>
<tr>
<td>548</td>
<td>Anesthesiology</td>
<td>Fall</td>
</tr>
<tr>
<td>561</td>
<td>Theriogenology I</td>
<td>Spring</td>
</tr>
<tr>
<td>562</td>
<td>Theriogenology II</td>
<td>Fall</td>
</tr>
<tr>
<td>563</td>
<td>Large Animal Medicine and Surgery</td>
<td>Fall</td>
</tr>
<tr>
<td>564</td>
<td>Large Animal Medicine and Surgery</td>
<td>Spring</td>
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<tr>
<td>566</td>
<td>Radiographic Techniques</td>
<td>Fall</td>
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<tr>
<td>567</td>
<td>Clinical Nutrition</td>
<td>Fall</td>
</tr>
<tr>
<td>568</td>
<td>Foundations of Clinical Science I</td>
<td>Fall</td>
</tr>
<tr>
<td>569</td>
<td>Foundations of Clinical Science II</td>
<td>Spring</td>
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<td>570</td>
<td>Theriogenology Service</td>
<td>Spring</td>
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<tr>
<td>572</td>
<td>Senior Seminar</td>
<td>Fall and spring</td>
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<td>574</td>
<td>Large Animal Surgery Service</td>
<td>Fall and spring</td>
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<tr>
<td>575</td>
<td>Ambulatory Service</td>
<td>Fall and spring</td>
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<tr>
<td>578</td>
<td>Anesthesiology Service</td>
<td>Fall and spring</td>
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<tr>
<td>579</td>
<td>General Medicine and Surgery</td>
<td>Spring</td>
</tr>
<tr>
<td>580</td>
<td>Radiology Service</td>
<td>Fall and spring</td>
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<tr>
<td>581</td>
<td>Clinical Nutrition</td>
<td>First year</td>
</tr>
<tr>
<td>582</td>
<td>Large Animal Surgical Exercises</td>
<td>Spring</td>
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<tr>
<td>583</td>
<td>Small Animal Medicine and Surgery</td>
<td>Fall</td>
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<td>584</td>
<td>Small Animal Medicine and Surgery</td>
<td>Spring</td>
</tr>
<tr>
<td>586</td>
<td>Small Animal Surgical Exercises</td>
<td>Spring</td>
</tr>
<tr>
<td>587</td>
<td>General Surgery</td>
<td>Fall, Offered 1985–86 only</td>
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<tr>
<td>589</td>
<td>Small Animal Medicine Service</td>
<td>Fall and spring</td>
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Microbiology

<table>
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<th>Course Code</th>
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<tbody>
<tr>
<td>315</td>
<td>Basic Immunology Lectures (also Biological Sciences 305)</td>
<td>Fall</td>
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<tr>
<td>316</td>
<td>Basic Immunology Laboratory (also Biological Sciences 307)</td>
<td>Fall</td>
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<td>317</td>
<td>Pathogenic Microbiology</td>
<td>Spring</td>
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<tr>
<td>515</td>
<td>Veterinary Immunology</td>
<td>Fall</td>
</tr>
<tr>
<td>516</td>
<td>Infectious Diseases I</td>
<td>Fall</td>
</tr>
<tr>
<td>517</td>
<td>Infectious Diseases II</td>
<td>Spring</td>
</tr>
<tr>
<td>519</td>
<td>Introductory Veterinary Microbiology</td>
<td>Spring</td>
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<tr>
<td>605</td>
<td>Special Projects in Microbiology</td>
<td>Fall and spring</td>
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<tr>
<td>606</td>
<td>Small Animal Infectious Diseases</td>
<td>Spring</td>
</tr>
<tr>
<td>706</td>
<td>Immunology Seminar Series</td>
<td>Fall and spring</td>
</tr>
<tr>
<td>707</td>
<td>Advanced Work in Bacteriology, Virology, Immunology</td>
<td>Fall and spring</td>
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<tr>
<td>709</td>
<td>Laboratory Methods of Diagnosis</td>
<td>Fall and spring</td>
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</table>
703 Receptor and Binding Theory and Techniques Fall.

Special Projects and Research

711 The Role of Calcium in Stimulus-Secretion Coupling Fall, spring, and summer.
712 The Receptor for Immunoglobulin E on Tumor Basophils Fall, spring, and summer.
713 Studies on Thyroid Hormone Metabolism and Action Fall, spring, and summer.
714 Studies on Renal Iodine Transport and Excretion Fall, spring, and summer.
715 Clinical Pharmacokinetics Fall, spring, and summer.
716 Neurobiology of Seizure Disorders Fall, spring, and summer.
717 Single-Channel Recording Fall, spring, and summer.
718 Structure-Function of the Nicotinic Acetylcholine Receptor Fall, spring, and summer.
719 Computer Modeling of Drug-Receptor Interactions Fall, spring, and summer.
720 Modulation of Nicotinic Acetylcholine Receptor Function by Substance P Fall, spring, and summer.
721 Molecular Mechanisms of Pharmacological Blockade of Voltage-Dependent Calcium Channels Fall, spring, and summer.
722 Mechanism of Action of Thyrotropin-Releasing Hormone Fall, spring, and summer.
723 The Role of Calcium in the Control of Electrolyte Transport Fall, spring, and summer.
724 The Control of Hormone Secretion Fall, spring, and summer.

Special Topics

741 Neuromodulation Fall, spring, and summer.
742 Receptor Mechanisms Fall, spring, and summer.
743 Neuropeptides Fall, spring, and summer.
744 Voltage-dependent Calcium Channels Fall, spring, and summer.
745 Neuropharmacology Fall, spring, and summer.
746 Electrophysiological Techniques Fall, spring, and summer.
747 Central Nervous System Neurotransmitter Receptors Fall, spring, and summer.
748 Stimulus-Secretion Coupling Fall, spring, and summer.
749 Second Messengers in Cell Activation Fall, spring, and summer.
750 Cell Calcium Fall, spring, and summer.
751 Receptors in the Immune System Fall, spring, and summer.
752 Mediators of Inflammation Fall, spring, and summer.
753 Clinical Pharmacology Fall, spring, and summer.
754 Clinical Endocrinology Fall, spring, and summer.
755 Calcium in the Control of Hormone Secretion Fall, spring, and summer.
756 Mechanisms of Calcium Handling Fall, spring, and summer.
757 Intestinal Electrolyte Transport Fall, spring, and summer.
758 Thyroid Hormone Metabolism and Action Fall, spring, and summer.
759 Receptor Binding Techniques Fall, spring, and summer.
374 Veterinary Medicine

525 Cell Physiology I Fall.
526 Systems Physiology I Fall.
527 Systems Physiology II Spring.
531 Regulatory Medicine Fall.
532 Medical Parasitology I Fall.
533 Medical Parasitology II Fall.
534 Medical Parasitology III Spring.
535 Medical Parasitology IV Spring.
536 Toxicology Fall.
537 Advanced Work in Animal Parasitology Fall and spring.
538 Graduate Research in Animal Parasitology (also Biological Sciences 719) Fall and spring.

539 Dependability of the Nervous System (Biological Sciences 711) Fall.
540 Development and Differentiation of Intestinal Epithelium (Biological Sciences 712) Spring.

541 Physiology of Pregnancy (Biological Sciences 714) Spring.
542 New Concepts for Improving Growth, Reproduction, and Lactation in Domestic Animals (Biological Sciences 715) Spring.
543 Seminar in Insect Physiology (Biological Sciences 716 and Entomology 685) Spring.
544 Structure and Function of Joints with Emphasis on Arthritis (Biological Sciences 717) Fall.
545 Gamete Physiology and Fertilization (Biological Sciences 718) Spring.
546 720 Special Problems in Physiology Fall and spring.
547 725 Physiology Spring.
548 726 Physiology Fall.
549 752 Biological Membranes and Nutrient Transfer (also Biological Sciences 618) Spring.
550 753 Mammalian Neurophysiology (also Biological Sciences 450) Spring.
551 758 Molecular Mechanisms of Hormone Action (also Biological Sciences 658) Spring.

552 Preventive Medicine

331 Medical Parasitology Fall.
332 Medical Parasitology Fall.
335 Wildlife Parasitology Spring.
510 Veterinary Parasitology Fall.
520 Preventive Medicine in Animal Health Management Spring.
531 Regulatory Medicine Spring.
560 Safety Evaluations in Public Health (also Toxicology 660) Spring.
663 Veterinary Medicine in Developing Nations Spring.
664 Introduction to Epidemiology Fall.
665 Advanced Epidemiology Fall.
737 Advanced Work in Animal Parasitology Fall and spring.
766 Graduate Research Fall, spring, and summer.

767 Immunoparasitology Spring.
768 Master's-Level Thesis Research Fall and spring.
769 Doctoral-Level Thesis Research Fall and spring.
783 Seminars in Parasitology Fall and spring.
786 Graduate Seminar Fall and spring.
787 The Biology of Parasitism (also Biological Sciences 459) Spring.
799 Independent Studies in Epidemiology Fall and spring.

Faculty Roster

Appel, Max J., Ph.D., Cornell U. Prof., Microbiology
Babish, John, Ph.D., Cornell U. Assoc. Prof., Preventive Medicine
Bell, Robin G., Ph.D., Australian National U. Assoc. Prof., Microbiology
Bergman, Emily N., Ph.D., U. of Minnesota. Prof., Physiology/(Section of Physiology)
Blue, Julie T., Ph.D., U. of Pennsylvania. Asst. Prof., Clinical Sciences
Bower, Paul H., Ph.D., Auburn U. Assoc. Prof., Avian and Aquatic Animal Medicine
Branner, Michael A., Ph.D., Cornell U. Prof., Preventive Medicine
Bruner, Matthew A., Ph.D., Cornell U. Prof., Microbiology
Campbell, S. Gordon, Ph.D., Cornell U. Prof., Microbiology
Carmichael, Leland E., Ph.D., Cornell U. John M. Olin Professor of Virology, Microbiology
Casterman, William L., Ph.D., U. of California at Davis. Assoc. Prof., Pathology
Center, Sharon A., D.V.M., U. of California at Davis. Asst. Prof., Clinical Sciences
Clark, Larry C., Ph.D., U. of North Carolina, Asst. Prof., Preventive Medicine
Cooper, Barry J., D.V.M., U. of Sydney (Australia). Assoc. Prof., Pathology
Corradino, Robert A., Ph.D., Cornell U. Assoc. Prof., Physiology/(Section of Physiology)
Cumings, John F., Ph.D., Cornell U. Prof., Anatomy
Cypess, Richard H., Ph.D., U. of North Carolina. Prof., Diagnostic Laboratory
Dahm, Karen S., Ph.D., U. of Michigan. Prof., Comparative Pathology
Dietze, Amy E., D.V.M., Cornell U. Prof., Clinical Sciences
Dill, Stephen G., D.V.M., U. of Georgia. Asst. Prof., Clinical Sciences
Dobson, Alan P., Ph.D., U. of Edinburgh (Scotland). Prof., Physiology/(Section of Physiology)
Dubovi, Edward J., Ph.D., U. of Pittsburgh. Asst. Prof., Diagnostic Laboratory
Dunne, Gary M., Ph.D., U. of Michigan. Asst. Prof., Microbiology
Eliopoulos, Michael N., Ph.D., U. of Guelph (Canada). Assoc. Prof., Preventive Medicine
Evans, Howard E., Ph.D., Cornell U. Prof., Anatomy
Fabricant, Julius, Ph.D., Cornell U. Prof., Avian and Aquatic Animal Medicine
Ferguson, Duncan C., Ph.D., U. of Pennsylvania. Asst. Prof., Pharmacology
Ferris, Clare V., Ph.D., U. of Oxford (England). Asst. Prof., Pharmacology
Flanders, James A., D.V.M., U. of California at Davis. Asst. Prof., Clinical Sciences
Fox, Francis H., D.V.M., Cornell U. Prof., Clinical Sciences
French, Tracy W., D.V.M., Purdue U. Asst. Prof., Pathology
Fubin, Susan L., D.V.M., U. of Georgia. Asst. Prof., Clinical Sciences
Gasteiger, Edgar L., Jr., Ph.D., U. of Minnesota. Prof., Physiology/(Section of Physiology)
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