Cornell University

Courses of Study

1983–84
Cornell University Calendar 1983–84

**Fall Semester**

Tuesday, August 23

- Monday and Tuesday, August 29 and 30
- Wednesday, August 31
- Monday, September 12
- Wednesday, September 21

- Friday–Sunday, September 30–October 2
- Saturday, October 15
- Wednesday, October 19
- Saturday, November 5
- Monday–Friday, October 31–November 11
- Wednesday, November 23
- Monday, November 28
- Saturday, December 10
- Sunday–Thursday, December 11–15
- Friday, December 16
- Friday, December 23

**Winter Session**

Variable periods between Monday, December 26, and Friday, January 20

**Spring Semester**

Monday, January 16

- Thursday and Friday, January 19 and 20
- Monday, January 23

- Monday, February 6
- Friday, February 10
- Saturday, March 24
- Monday, April 2
- Monday–Friday, April 9–20
- Saturday, May 5
- Sunday–Wednesday, May 6–9
- Thursday, May 10
- Saturday, May 19

- Friday–Thursday, May 20–26
- Sunday, May 27

**Summer Session 1984**

- 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 therein, 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.
Contents

2 Cornell University Calendar
5 The University
5 The Students
6 University Resources
7 Degree Programs
8 Division of Unclassified Students
8 Business and Preprofessional Study
9 Interdisciplinary Centers and Programs
11 Advanced Placement of Freshmen
15 Special Academic Services and Programs
16 Counseling and Academic Advising Services
17 Student Life and Activities
20 University Registration
21 Class Schedules and Attendance
22 Grading Guidelines
23 University Requirements for Graduation
23 Bursar Information
25 Programs of Financial Assistance
26 College of Agriculture and Life Sciences
26 Advising and Counseling Services
26 Students
27 Degree Programs
28 Academic Procedures and Policies
28 Off-Campus Study
28 Course Changes (Add/Drop/Change)
29 Academic Achievement and Progress
29 Special Academic Opportunities
31 Major Fields of Study
36 Special Programs and Career Options
37 Nondepartmental Courses
37 Agricultural Economics
41 Agricultural Engineering
43 Agronomy
45 Animal Sciences
48 Communication Arts
51 Education
55 Entomology
57 Floriculture and Ornamental Horticulture
59 Food Science
61 International Agriculture
62 Microbiology
64 Natural Resources
66 Plant Breeding and Biometry
66 Plant Pathology
67 Pomology
68 Rural Sociology
71 Statistics and Biometry
72 Vegetable Crops
73 Faculty Roster
77 College of Architecture, Art, and Planning
77 Degree Programs
77 College Academic Policies
77 Architecture
83 Art
86 City and Regional Planning
91 Landscape Architecture
92 Faculty Roster
94 College of Arts and Sciences
94 Calendar Supplement
94 Program of Study
96 Special Academic Options
98 Registration and Course Scheduling
99 Academic Standing
100 Grades
100 Advising
101 American Studies
101 Anthropology
105 Archaeology
106 Asian Studies
111 Astronomy
112 Biological Sciences
113 Chemistry
116 Classics
120 Comparative Literature
122 Computer Science
123 Economics
127 English
133 Geological Sciences
133 German Literature
133 Government
138 History
144 History of Art
147 Mathematics
151 Modern Languages and Linguistics
151 Modern Languages, Literatures, and Linguistics
169 Music
173 Near Eastern Studies
176 Philosophy
178 Physics
182 Psychology
187 Romance Studies
187 Russian Literature
188 Sociology
193 Theatre Arts
199 Special Programs and Interdisciplinary Studies
216 Faculty Roster
221 Division of Biological Sciences
240 Graduate School of Business and Public Administration
242 College of Engineering
242 Degree Programs
242 Undergraduate Study
250 Engineering Common Courses
252 Applied and Engineering Physics
254 Chemical Engineering
255 Civil and Environmental Engineering
261 Computer Science
263 Electrical Engineering
266 Geological Sciences
268 Materials Science and Engineering
271 Mechanical and Aerospace Engineering
274 Nuclear Science and Engineering
274 Operations Research and Industrial Engineering
277 Theoretical and Applied Mechanics
278 Faculty Roster
281 Graduate School
282 School of Hotel Administration
282 Curriculum
283 Undergraduate Program of Study
284 Graduate Curriculum
285 Administrative and General Management

continued on next page
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 1860s he went out into the American business world, where he met Morse, inventor of the telegraph, became his partner, and was himself soon a wealthy man.

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

From the beginning the university had two obligations. First, to offer scholarships to New York State residents: the land-grant money made that necessary. In doing this, Cornell University acted as a public institution. And, as a private institution, it served all comers who could qualify for admission.

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

White was the University's first president. He had assembled a faculty of distinguished scholars from the United States, Canada, and Great Britain, many of whom, including a prominent Oxford professor, came to Cornell because they regarded the University's approach to education as pioneering, lively, and suited to the needs of the time. What more appropriate than that, in this spirit of pioneering, Cornell should admit its first woman student in 1870, appropriate than that, in this spirit of pioneering, Cornell should admit its first woman student 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 greatest universities of the United States, Canada, and Great Britain, many of its scholars came 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 sixteen 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 many parts, such as mechanical, electrical, and chemical, and among the biological sciences there were similar divisions. Among the endowed colleges, a School of Hotel Administration appeared, and a Graduate School of Business and Public Administration. 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-telescope.

Cornell University has come to be a place of learning whose scholars and students have reached out into all disciplines 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 a member of a large enterprise of hundreds of thousands of students, the dedication of thousands of professors, the skill of administrators, the wisdom of trustees.

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. Schurman, 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.

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The Students

Cornell University has a student body of about 16,000 in the eleven schools and colleges at Ithaca. More than 28 percent of the students are engaged in graduate and professional study. The student body is diverse in interests and background, with 53 percent of the undergraduates from New York State, 43 percent from the remaining fifty states, and 4 percent from over ninety foreign countries.

Regional Origin of Students

<table>
<thead>
<tr>
<th>Region</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>1,699</td>
</tr>
<tr>
<td>New York State</td>
<td>8,069</td>
</tr>
<tr>
<td>Mid-Atlantic</td>
<td>2,619</td>
</tr>
<tr>
<td>Southeast</td>
<td>485</td>
</tr>
<tr>
<td>Midwest</td>
<td>1,126</td>
</tr>
<tr>
<td>Southwest/Mountain</td>
<td>323</td>
</tr>
<tr>
<td>Far west</td>
<td>671</td>
</tr>
<tr>
<td>Foreign and United States possessions</td>
<td>1,080</td>
</tr>
</tbody>
</table>

Total 16,072

*Figures are for fall 1982 and do not include extramural students, students registered in absentia, or students in the New York City divisions.

Retention and Graduation of Undergraduates

By fall 1982, 84.3 percent of the students that entered endowed undergraduate units in fall 1976 (Architecture, Art, and Planning, Arts and Sciences; Engineering; and Hotel Administration) had either graduated or were still enrolled. In the statutory units (Agriculture and Life Sciences; Human Ecology; and Industrial and Labor Relations) 91.4 percent had graduated or were still working toward a Cornell degree.

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, 217 Day Hall, Ithaca, New York 14853. Other questions or requests for special assistance may also be directed to that office.
University Resources

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

University Libraries

The Cornell University Libraries are rated as one of the major academic library systems in the United States. The sixteen campus libraries contain well over four million volumes and currently subscribe to fifty-two thousand periodicals. These 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 by the libraries. All libraries are open long hours, some until midnight, and schedules and tour information are available at every library.

At the south end of the Arts Quadrangle is Uris Library, the building with the tower that has become the symbol of Cornell. Uris is essentially 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 129,000 volumes, are open to all, and only reserve books in heavy demand are held in a special category. There are listening rooms where students, singly or in groups, may 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, a collection on East and Southeast Asia, an Icelandic collection, History of Science collections, the archives of the University, maps, and newspapers.

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

Other college libraries include 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 serving the Graduate School of Business and Public Administration, 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. The library issues directories of locations by subject, hours, and services that are available in all the libraries.

Orientation sessions on how to use the library are offered at the beginning of each semester by the larger campus libraries. Schedules for vacation periods, intersession, and summer session are always posted or available at the separate libraries.

Museums and Art Exhibitions

The Herbert F. Johnson Museum of Art, designed by world-renowned architect I.M. Pei, complements the architecture and vistas of the more traditionally styled campus. Its sweeping views give visitors and residents a new perspective on the beauty of Cayuga Lake.

The museum's collections are particularly strong in Asian art, nineteenth- and twentieth-century painting, and the graphic arts. Located on Central Avenue, the museum is open daily Tuesday through Sunday, 10:00 a.m. to 5:00 p.m.

The museum has an active membership program, and members' contributions are the main source of funds for acquiring works of art. Anyone interested in becoming a member may inquire at the reception desk or call 256-6464.

Art exhibitions. The Herbert F. Johnson Museum of Art. Other campus locations for art displays include the Art Room in the Straight, the John Hartell Gallery in Sibley Hall, and the galleries in Goldwin Smith Hall, Martha Van Rensselaer Hall, and Tjaden Hall.

Music

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

The University Faculty Committee on Music sponsors programs by visiting soloists and major orchestras in the Bailey Hall Concert Series, string quartets and other groups in the Statler Series at Alice Statler Auditorium, and occasional operas, ballets, and special events. Several times each month the department 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 operates two local optical observatories, the Fuertes Observatory (near the North Campus dormitory area) and the Hartung Boothroyd Observatory, and the world's largest radio-radar telescope, in Arecibo, Puerto Rico.

The Spacecraft Planetary Imaging Facility, a joint undertaking of NASA's Planetary Geology Program and the University, serves as a focus for planetary studies at Cornell and is one of seven such facilities in the United States. The facility contains a comprehensive collection of thousands of images obtained by United States planetary and lunar spacecraft, as well as related cartographic and support data.

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. These productions include guest professionals, graduate actors, designers, and directors 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 are held twice a year. The department also has, in its studio theater, a more informal production program, directed, acted, designed, and managed entirely by students. Staffing and casting for these events take place throughout the year.

Other theatrical opportunities can be found at Reiley 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 division of the Department of Theatre Arts sponsors a range of possibilities for students interested in dance. Informal and formal dance programs are presented by the department each year by student dancers and choreographers. In the spring, a dance concert presents works by guest, faculty, and student choreographers. The division also sponsors a series of performances by touring professional dance companies during the year. 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. The Department of Physical Education and Athletics usually offers a course in folk or square dancing each semester.

Lectures

On the more academic side of university 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.
The University 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

The Eleanor J. Gibson Laboratory of Developmental Psychology explores the development of perception in infants. Research in infant language acquisition is carried out in Martha Van Rensselaer Hall. Uris Hall houses the Human Experimental Laboratory (of the Department of Psychology), a biopsychology laboratory, and a social psychology laboratory.

Computer Services

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

Cornell’s main computers consist of large-scale IBM computers with attached array processors, a VAX 750, and a DECSYSTEM 2060. Public terminal facilities are located in seven different areas on campus. They house more than 165 workstations, including 50 Terak microcomputers used for introductory programming courses. Freshman writing courses are now using nine IBM Displaywriters in a new word processing center in Goldwin Smith Hall. Cornell added a second Floating Point Systems attached array processor to its computing system in 1982. These specialized computers are very fast and highly cost effective for long calculations.

Cornell is also a member of BITNET and MAILNET, providing two-way "electronic mail" service between Cornell and other universities.
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, 156 Olin Hall.
3) Submit Application for Transfer coupons to the Office of the University Registrar, 222 Day Hall, 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 field, both 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 Graduate School of Business and Public Administration as well as in graduate fields following each of the undergraduate options.)

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

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

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 to anticipate 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. This undergraduate program provides managers for the hospitality industry. Capability for management of motels, hotels, condominiums, restaurants, clubs, hospitals, and land and facility development is developed through instruction in personnel and general administration, financial management, food and beverage service, and communications. Students interested in the School of Hotel Administration must have developed an explicit awareness of and commitment to this area through work experience, reading, study, and discussions with industry representatives.

Consumer economics and housing. The focus is on the economic behavior and welfare of consumers in the private, public, and mixed sectors of the economy. There is an option for special concentration on housing. Study aims at an understanding of economics, sociology, and government policy as they apply to consumer problems.

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

Related Areas

Courses in areas directly related to these business programs are found in many of the University departments. For example, quantitative methods may be studied in the Departments of Mathematics and Computer Science, and courses in public administration are found in the Departments of Government, and City and Regional Planning. There are additional 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 Graduate School of Business and Public Administration, special opportunities exist for highly qualified undergraduates to combine their undergraduate programs with graduate study in that school. Students in the double-register 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...
Preventive Veterinary Medicine

There is no specific pre-veterinary 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 pre-veterinary students enroll in the College of Agriculture and Life Sciences. However, because of the statutory nature of that college, out-of-state applicants will find it extremely difficult to gain acceptance into its biological sciences or animal sciences programs. These and other students, because of their secondary interests or desire for a broader undergraduate curriculum, often enter other divisions of the University, especially the College of Arts and Sciences.

The college-level prerequisite course 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, 2117 Schuman Hall, Ithaca, New York 14853.

Premedical Study

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

There is no major program that is the best for those considering medical or dental school, and students are therefore encouraged to pursue their own intellectual interests. Students are more likely to succeed at, and benefit from, subjects that interest and stimulate them, and there is no evidence that medical colleges give special consideration to any particular undergraduate training beyond completion of the required courses. In the past, most 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.
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 juniors, seniors, and graduate students from all colleges, schools, and divisions of the University. Full academic credit can be earned for the semester. Most students enroll in the seminar-internship course, Projects in Public Policy (Government 490), which involves a major research study carried out through an internship. 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. In addition, special programs are offered in architecture, industrial and labor relations, and communication arts. All seminars are taught by Cornell faculty and carry appropriate credit towards fulfillment of major, distribution, and other academic requirements.

Housing accommodations can be arranged for all interested participants. Fully furnished apartments are available in a newly renovated, centrally located apartment complex.

Further information concerning internships, courses, and other features of the program may be obtained from the Cornell-in-Washington office at 134 McGraw Hall (telephone: 256-4090).

Program on Science, Technology, and Society

Dr. Walter R. Lynn, director, 632A Clark Hall, 256-3810

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

Biology and Society Major

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

Graduate Studies

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

Courses

STS courses are cosponsored by the University academic departments. The titles and numbers of these courses are listed below, for course content and other details, refer to the listings of the particular cosponsoring department. Further information concerning the program, including a list of STS-related courses offered throughout the University and information concerning individualized courses of study, may be obtained from the program office, 632 Clark Hall (telephone: 256-3810).

Biomedical Ethics (Biological Sciences 205 and Philosophy 245)

The Politics of Technical Decisions (Sociology 670, City and Regional Planning 541, Government 528, and Business and Public Administration NPA 515, 2 semesters)

Social Implications of Technology (Civil and Environmental Engineering 325)

Environmental Law (Civil and Environmental Engineering 626)

Urban Affairs Laboratory (Government 312)

Science, Technology, and Law (Law 780)

International Politics of Energy (Government 490)

History of Biology (History 287 and Biological Sciences 201)

Environmental Ethics (Biological Sciences 206 and Philosophy 246)

Urban Affairs Laboratory (Government 312)

Science and Human Nature (Philosophy 286)

Technology, Society, and the Human Condition (Mechanical and Aerospace Engineering 302)

Seminar in Technology Assessment (Civil and Environmental Engineering 426 and College Scholar 464)

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

Science, Technology, and Human Needs (Design and Environmental Analyses 232)

History of Technology (History 288 and Biological Sciences 202)

The Population Biology of Health and Disease (Veterinary Medicine 330)

Biology and Society Senior Seminars (Biology and Society 400–408)

Issues in Biology and Society: Chemicals, Enzymes, and Maladies (Biology and Society 310)

Biological Basis of Sex Differences (Biology and Society 311)

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

Science and Human Nature (Philosophy 286)

Scientists and Social Policies (Society for the Humanities 333)

Transportation Economics (Civil and Environmental Engineering 666)

War and Peace in the Nuclear Age (Government 384 and Physics 206)

Rhetoric and Technology (Comparative Literature 315)

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

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

Issues in Biology and Society: Professional Ethics (Biology and Society 311)

Human Growth and Development (Biology and Society 347 and Human Development and Family Studies 347)

Independent Study (Biology and Society 375)

Program in Comparative and Environmental Toxicology

C. F. Wilkinson, director, N202 Martha Van Rensselaer Hall, 256-6112 or 256-6113

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 in many University departments.

Graduate Studies

The major 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 prepares students for solving the problems of modern toxicology. Specialization tracks include biochemical, genetic, nutritional, and veterinary toxicology, ecotoxicology, and policy issues associated with issues such as risk assessment, 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 cosponsoring 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 311)

Tox 370 Pesticides in the Environment (Entomology 370)

Tox 418 Mutagenesis and Genetic Toxicology (Animal Science 418)

Tox 419 Animal Genotoxicity (Animal Science 419)

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

Tox 443 Managing the Aquatic Environment (Natural Resources 443)

Tox 528 Pharmacology (Veterinary Medicine 528)

Tox 605 Ecology and Management of Disturbed Aquatic Systems (Natural Resources 605)

Tox 609 Effects of Ecological Perturbations on Fishes (Natural Resources 609)

Tox 610 Introductory Chemical Toxicology (Food Science 610)

Tox 611 Molecular Toxicology (Nutritional Sciences 611)
Advanced Placement of Freshmen

The appropriate department of instruction sets the standards of achievement that must be met for advanced placement at Cornell and recommends AP credit for those who meet the standards. This recommendation is almost always based on some examination score. The student's college decides whether to award the credit. 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 and the College-Level Examination Program (CLEP) of the College Entrance Examination Board, and the United States Armed Forces Institute are considered. Entering freshmen should have their scores sent to their college or school office (see 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 on the basis of departmental examinations given on campus during orientation week. A schedule of these examinations will appear in the orientation booklet that will be mailed to entering students in late summer. The departments that award advanced placement and credit on the basis of CEEB Advanced Placement Examinations, CEEB College-Level Examination Program tests, or departmental examinations are shown below.

Transfer of credit. Entering freshmen who have completed college courses for which they wish to receive credit toward their Cornell degree should send transcripts and course descriptions to their college or school office (see 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 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 placement policy for foreign credentials may be obtained by contacting the Assistant Director of International Admissions, Cornell University, 410 Thurston Avenue, Ithaca, New York 14850, 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.

Biological Sciences

The Division of Biological Sciences grants advanced placement credits and exemption from introductory biology courses based on superior performance on the CEEB Advanced Placement Examination in biology or on the special departmental examination, as follows.

Any student who earns a score of 5 on either of these examinations may elect to receive eight credits and be permitted exemption from all introductory biology courses.

Students not mapping in biological sciences who score a 4 or 5 may receive, respectively, six or eight advanced placement credits. This will satisfy the distribution requirement in biological sciences for students in the College of Arts and Sciences and the College of Human Ecology, and a portion of the Group B distribution requirement for students in the College of Agriculture and Life Sciences.

Biological sciences majors and others expecting to take advanced biology courses who receive a score of 4 must fulfill the introductory biology requirement by taking Biological Sciences 103–104. These students will receive a total of eight introductory biology credits (four advanced placement credits plus four course credits).

Students with strong preparation in biology may take the departmentally administered examination by arranging in advance with the General Biology Office, Cornell University, 310 Roberts Hall. This examination is given only once annually, during Orientation Week. A sheet describing the examination content and format, eligibility, fee, and credit is available by writing to that office.

Chemistry

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

Freshmen may qualify for advanced placement and advanced standing credits in chemistry by satisfactory performance on the CEEB Advanced Placement Examination in chemistry or by passing an advanced standing examination offered by the department. A score of 3 or 4 on the CEEB examination qualifies the student for 4 credits; a score of 5 on the CEEB examination entitles the student to 8 credits. A student may also earn four or eight credits by suitable performance on the departmental examination. Before taking the special departmental examination, students should consult Dr. Stanley Marcus, in 150 Baker Laboratory.

The specific course in which a student will register after having received a certain advanced placement standing will be decided by consultation between the student, his or her adviser, and the professors teaching the courses. Students receiving advanced placement who are interested in a major in chemistry or a related science should consider taking Chemistry 215–216 and should consult Professor Barbara Baird.

Classics

For advanced placement and credit in Latin and Greek, students should consult the Department of Classics, Cornell University, 120A Goldwin Smith Hall. Advanced placement and credit are determined as outlined below.
Latin. Students may be tentatively placed in a 300-level Latin course if they achieve a score of 4 or 5 on the CEEB Advanced Placement Examination, but they must also take the department's own placement examination in Latin during orientation week. A student who is permitted to register in a 300-level course will be given six advanced placement credits.

Greek. For information concerning advanced placement, consult the chairman of the Department of Classics.

Computer Science

Beginning in fall 1983, Cornell will offer advanced placement in computing. However, because of the variety of different programming languages, this cannot easily be accomplished with an examination. Instead, a special version of the regular introductory programming course will be offered during the first five weeks of the term. This introduces students to the programming language (PL/1) and the programming system used at Cornell and provides a review of the key ideas in programming. Students who complete this course satisfactorily (with a grade of B– or better) receive four credits for the full-term introductory programming course (Computer Science 100). A student who stands out in this advanced placement programming course can at any time, without penalty, switch to the regular introductory course.

The Department of Computer Science has just introduced this option, and the various colleges have not yet decided whether to allow their students to participate. More information will be available at a later date.

Economics

The Department of Economics will grant up to six advanced placement credits to a student who scores 600 or higher in the College-Level Examination Program test in introductory economics. Such a student will be admitted to courses for which Economics 101 and 102 are prerequisites.

For further information, write to the Department of Economics, Cornell University, 416 Uris Hall.

English

For exceptionally well qualified freshmen the Department of English will recommend three or six advanced placement credits, and freshmen for whom such credit has been recommended will also be eligible to enroll in English 270, 271, or 272.

The department will consider awarding advanced placement credit to freshmen who receive scores of 750 or above on the CEEB College Placement Test (CPT; formerly CEEB Achievement Test) in English composition, 710 or above on the CEEB College Placement Test in literature, or 5 on the CEEE Advanced Placement Examination. Students who seek advanced placement credit are encouraged to take as many of these tests as possible.

Students who receive scores of 700 to 749 on the CEEB College Placement Test in English composition, 700 to 709 on the CEEB College Placement Test in literature, or 4 on the CEEE Advanced Placement Examination will be eligible to take an advanced placement examination offered by the department during orientation week. These students, too, are eligible to take English 270, 271, or 272. This examination will be an important factor in awarding advanced placement credit. The department will also consider secondary school grades in determining whether credit will be awarded.

Advanced placement credit awarded in English may not be used to satisfy the humanities or expressive arts requirement of the College of Arts and Sciences. If space permits, freshmen whose secondary school records indicate they are qualified may enroll in English 270, 271, or 272 during their first semester.

German Literature

The Department of German Literature will grant three credits to students with a score of 4 or 5 on the Advanced Placement Examination. For information about the College Placement Test, see "Modern Languages," below.

History

The Department of History will grant four credits to students who score 4 or 5 on the CEEE 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.

History of Art

The Department of History of Art will review examination papers of students with scores of 4 or 5 on the CEEE Advanced Placement Examination. Students may be eligible to register for 300-level courses in the Department of History and may also receive three credits. Questions concerning advanced placement may be directed to the department chairman, Cornell University, 35 Goldwin Smith Hall.

Mathematics

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

The regular freshman calculus courses at Cornell do not differ substantially from calculus courses given in many high schools, and it is best to avoid repeating material that has already been covered at an appropriate level. Secondary school students who have had the equivalent of at least one semester of analytic geometry and calculus should, if possible, take one of the CEEE'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 214–215–216–218, but students entering Mathematics 293 may have to make up some material on partial differentiation. Students with a 3 on the BC examination or a 4 or 5 on the AB examination may take the appropriate second-semester course (Mathematics 192, 122, or 112). Students with a 2 on the BC examination or a 3 on the AB examination may take one of the second-semester courses (Mathematics 192 or 112). Advanced placement credit will be awarded appropriately; however, no credit will be granted for a grade of 1 on the BC or 1 or 2 on the AB examination.

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

History, 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 CEEE Advanced Placement Examination,
2) have received a 2 on the BC examination or a 3 on the AB examination and want to enter the upper sequence; or
3) believe that the placement assigned on the strength of the CEEE 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.

Students entering the upper sequence who have a firm grounding in the first semester of calculus but cannot omit the second may, with the consent of the Department of Mathematics, take Mathematics 122 and 221 simultaneously in their first semester. Thus students who take Mathematics 222 in the second semester may have completed the sophomore course by the end of their first year.

Modern Languages

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

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

1) For high school work, three to eight credits may be granted for the equivalent of 200-level courses. Credit is based on performance on the CEEE 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 earned a grade of 3 on the CEEE Advanced Placement Examination or a score of 5 on the CEEE Advanced Placement Examination and want to enter the upper sequence. Outstanding performance on this examination could provide three additional credits.

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

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

Information about times and places to take placement tests is available in the orientation booklet, from Academic and Career Counseling Services, and from
### 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>Arabic</td>
<td></td>
<td></td>
<td>Department determines credit and placement based on departmental examination.</td>
</tr>
<tr>
<td>Biology</td>
<td></td>
<td></td>
<td>Placement out of all introductory courses.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Satisfies the introductory biological sciences distribution requirement.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 AP credits awarded after completion of 103–104</td>
</tr>
<tr>
<td></td>
<td></td>
<td></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>5</td>
<td>6 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td></td>
<td>3,4</td>
<td>4 credits</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td>Computer Science</td>
<td></td>
<td>4 credits upon successful completion of Computer Science 100 for students with previous experience.</td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td></td>
<td></td>
<td>Department determines credit and placement.</td>
</tr>
<tr>
<td>English</td>
<td></td>
<td></td>
<td>Department uses additional measures: Qualified students are notified.</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 determines placement. Students may earn additional credit by taking CASE examination.</td>
</tr>
<tr>
<td>German literature</td>
<td>5</td>
<td>3 credits (and proficiency)</td>
<td>Department determines placement.</td>
</tr>
<tr>
<td>Greek</td>
<td>4,5</td>
<td></td>
<td>Department determines credit and placement based on departmental examination.</td>
</tr>
<tr>
<td>Hebrew</td>
<td></td>
<td></td>
<td>Department determines credit and placement based on departmental examination.</td>
</tr>
<tr>
<td>American history</td>
<td>4,5</td>
<td>4 credits</td>
<td>Department determines credit and placement.</td>
</tr>
<tr>
<td>European history</td>
<td>4,5</td>
<td>4 credits</td>
<td>Department determines credit and placement.</td>
</tr>
<tr>
<td>History of art</td>
<td>4,5</td>
<td></td>
<td>Department determines credit and placement.</td>
</tr>
<tr>
<td>Italian literature</td>
<td>4,5</td>
<td>3 credits (and proficiency)</td>
<td>Department determines credit and placement. Students may earn additional credit by taking departmental examination.</td>
</tr>
<tr>
<td>Latin</td>
<td>4,5</td>
<td></td>
<td>Department determines credit and placement.</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></td>
<td>Department determines credit and placement based on departmental examination.</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 or Mathematics AB</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>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>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></td>
<td>4</td>
<td>Choice of acceptance of 4 credits for Physics 208 (or 213) or placement into Physics 217 with no AP credit. See department representative.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</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></td>
<td></td>
<td>Department determines credit and placement.</td>
</tr>
<tr>
<td>Sociology</td>
<td></td>
<td></td>
<td>Department determines credit and placement.</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 CASE 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.
the Department of Modern Languages and Linguistics. Students must register for these tests at Academic and Career Counseling Services, 203 Barnes Hall, and pay a fee. For more information, see the College of Arts and Sciences section on language course placement, or contact the Department of Modern Languages and Linguistics, Cornell University, 203 Morrill Hall.

Music
Advanced placement and credit are awarded only in music theory and only on the basis of a comprehensive examination administered by the Department of Music, normally during orientation week. If special arrangements are made, the examination may be administered at other times during the academic year. All students interested in taking this examination should consult Professor S. Stucky. Inquiries may be directed to the Department of Music, Cornell University, 124 Lincoln Hall (telephone: 607/255-4097).

Near Eastern Studies
For advanced placement and credit in Hebrew and Arabic, students should consult the Department of Near Eastern Studies, Cornell University, 388 Rockefeller Hall. Advanced placement and credit are determined by departmental examination.

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

Physics B. Students earning a score of 4 or 5 may receive eight credits for Physics 101 and 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. To receive credit in calculus-based physics courses, a student should be eligible for advanced placement or transfer credit in one semester of the mathematics calculus sequence for each physics course credited.
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 206 or placement into Physics 217 with no AP credit. Students earning a score of 4 will be eligible for four credits for Physics 208 or placement into Physics 217 with no AP credit. Students with scores of 4 or 5 should first meet with the department representative, Professor R. Cotts, 522 Clark Hall, for advice on making a selection.
Advanced placement into a next-in-sequence course depends on the completion of the appropriate mathematics prerequisites before enrolling. To qualify for advanced placement credit it is not necessary to continue the study of physics.

Psychology
Students who have scored well on the CEEB College-Level Examination Program psychology test may receive advanced placement credit in psychology. Those interested in taking further courses in psychology should consult a faculty member in the Department of Psychology, Cornell University, 214 Usins Hall. Advanced placement based on the CEEB test may not be used to satisfy the distribution requirement in the College of Arts and Sciences. Credit toward the requirements of a major in psychology will depend on the recommendation of the student's major adviser.

Romance Studies (French and Spanish Literature)
The Department of Romance Studies grants three credits to students with a score of 4 or 5 on the CEEB Advanced Placement Examination in French or Spanish literature. For more information about the College Placement Test, see "Modern Languages," p. 12.

Sociology
The Department of Sociology will recommend three advanced placement credits for students who receive the equivalent of a B on the CEEB College-Level Examination Program sociology test and whose essays are considered acceptable by the department. Students receiving this credit will be eligible for placement into courses for which an introductory course in sociology is the prerequisite.
For further information, contact the Department of Sociology, Cornell University, 323 Uris Hall.

College of Arts and Sciences Regulations
Courses taken at other colleges before matriculation at Cornell may count toward the degree if the appropriate department approves. Such credit is counted as part of the 120 credits required for the degree, but not as part of the 100 credits required in College of Arts and Sciences courses unless the department concerned accepts such courses as fulfilling part of the major requirement.
Students who want to receive credit for college courses taken elsewhere during the summer before matriculation at Cornell should bring the relevant catalog descriptions when they come to campus, even if the transcript is not yet available.
Freshmen who have taken courses at Cornell should ask the Office of the University Registrar, 222 Day Hall, to send transcripts to the college records office, 144 Goldwin Smith Hall.

Further Information
For further information about advanced placement, students should contact the person in the appropriate college or school listed below. Entering freshmen should have their advanced placement test scores sent to their school or college office.
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, occasionally, the 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 eighteen students. In addition, Freshman Seminars follow a common set of guidelines:

1) at least thirty pages of assigned writing
2) at least eight (and, at most, about fourteen) written assignments
3) opportunities to revise essays
4) ample classroom time spent on work directly related to writing
5) reading assignments small enough 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 pp. 204–208).

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 on the first floor of Rockefeller Hall; the director is Nancy Kaplan). The Writing Workshop also offers (1) 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), and (2) 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.

Field Service and Study Abroad

Field service and study abroad provide students with invaluable experiences. Most opportunities are offered through individual departments or colleges and are described in those sections. Students are also encouraged to consult the Career Center for information on programs that are not directly sponsored by the University.

The Learning Skills Center

For a description of the services provided by the Learning Skills Center, see the section "Minority Education," p. 16.

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 on reading and learning strategies is offered through the College of Human Ecology. In addition to the minicourses, audio cassettes on these topics are maintained at the center, in the Media Room of Uris Library, the reserve desk of Mann Library, room C111 of the College of Veterinary Medicine, and at the three student unions. The Reading and Study Skills Program is located in the Learning Skills Center, 375 Olin Hall (telephone: 256-8269).

Tutoring Services

Tutoring is available through many departments and organizations. Students who need tutoring may contact their school or college offices, their faculty advisers, or their professors for information about sources of tutoring assistance.

Interfraternity Council. 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, call 256-5183 or stop at the IFC office, 210 Willard Straight Hall.
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 wherever 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 those 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: 607/255-5221), houses an extensive career library with up-to-date resources on careers and career decision making, employment, graduate and professional schools, study abroad programs, and video and audio tapes. It also offers seminars on applying to graduate 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 (telephone: 256-5599), and provides special information resources and advice for students interested in careers or professional schools in the health fields (telephone: 256-3519).

Services for the Disabled

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

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

Kathleen Donovan, Office of Equal Opportunity, 217 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, where appropriate, referral to the proper resource person. Anyone who will need special accommodations either in his or her living situation or with classes should contact her as soon as possible.

Each school within Cornell University has designated a representative to assist disabled students with such matters of academic concern as course scheduling, classroom changes, and special provisions for taking examinations. Their names are listed in a brochure for disabled students that may be obtained from the coordinator for the disabled, 217 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." Through COSEP 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, during the selection process, in identifying qualified minority students with disadvantaged educational and economic backgrounds as well as those who traditionally have been underrepresented in higher education.

2) Provide minority students with academic, tutorial, and counseling services to ensure progress on the completion of their degrees.

3) Provide financial support, administered through the Office of Financial Aid, that is sufficient to meet the demonstrated need of minority students enrolled at the University.

The COSEP program is not intended to provide remedial support. Therefore the academic and personal freedom of the students participating in the program is not restricted. Participation in the COSEP program is voluntary and may be requested by minority students who are United States citizens or permanent residents. All minority students are encouraged to take full advantage of the opportunities offered at Cornell.

The Learning Skills Center

The Learning Skills Center (LSC) is the academic support unit of COSEP. The LSC provides academic advising, preparatory instruction in core courses, (biology, physics, English, chemistry, and mathematics), and tutoring of study sessions. A freshman-year summer program gives new students an opportunity to pursue college courses before fall enrollment. The LSC has study hall accommodations and provides students access to typewriters, calculators, a reserve library, course notes, previous examinations, and tapes. Academic advising, including help in specific areas of study, scheduling, or programming information is provided by LSC staff.

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, Business, Engineering, and the School of Hotel Administration). These programs are called EOP and HEOP respectively.

HEOP gives 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 Office of Financial Aid, the Career Center, and the 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:

African Students Organization
Affinica Players
Alpha Kappa Alpha
Alpha Phi Alpha
Asian American Coalition
Asociación Latina
Black Athletic Association of Cornell
Black Bio-Medical and Technical Association
Black Student Coalition
Chinese Cultural Society
Club Haitien
Cornell Black Agriculturalists
Cornell Undergraduate Law Society
Cuban Cultural and Historical Society
Delta Sigma Theta
Kappa Alpha Psi
MESA (Mexican Education Student Association)
Minority Business Student Association
Minority Education Committee
Minority Education Council
Minority Students in the Social Sciences
National Society for Black Engineers
Northeast American Indians at Cornell
Nigerian Association
Omega Psi Phi
Pamoa Ni Singers
Phi Beta Sigma
Third World Programming Board
UBIQUITY Publications
Ururu-Kubwa

International Student Office

The International Student Office, 200 Barnes Hall (telephone: 607/255-5243), serves as an information center and provides arrival assistance, housing...
Financial Aid

Eligibility and Availability

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

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

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

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 that is 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. Due to 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.

Note: Foreign students in the School of Hotel Administration who want to fulfill their practice credit requirement by working in the United States during vacations or the summer should contact the Hotel School registrar’s office.

Health Requirement

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. Free chest 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.

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.

Personal Counseling Services

University Health Services. Counseling services are provided in the health center and the Psychological Service. For an appointment at the Psychological Service, the student should call 256-5208 or go to the center.

Cornell United Religious Work. A diverse staff of pastoral counselors and advisers, available day and night for consultation, may be reached through the office, 118 Anabel Taylor Hall (telephone: 256-4214).

Empathy, Assistance, and Referral Service (EARS). EARS is a peer counseling service offered through the Office of the Dean of Students, available to the Cornell community for walk-in counseling (211 Willard Straight Hall) or telephone counseling (256-EARS or 256-RAGE).

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

Office of the Dean of Students, in 103 Barnes Hall, provides short-term counseling, personal-growth workshops, consultation, and referral (telephone: 256-4221 and 256-3606).

Visa regulations also stipulate that students must carry at least twelve credits each term. Foreign students who are petitioning 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.

Student Life and Activities

Office of the Dean of Students

The primary aim of the Office of the Dean of Students (ODS) 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 offices to contact. ODS 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.

A further 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 ODS, including the Cornell Calendar; Policy Notebook and Digest for Students, Faculty and Staff, and Off-Campus Housing in the Ithaca Area.

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.

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 Office of the Dean of Students in 103 Barnes Hall.

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.

Information concerning University housing is available from the Department of Residence Life, Cornell University, 1142 North Balch Hall, Ithaca, New York 14853.
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 have a variety of time and meal periods on a five- or seven-day basis. Members are not penalized for switching meal plans to better meet their individual academic routines. Maximum flexibility is included with a two-meal-a-day plan that offers a choice of breakfast or lunch, and dinner daily. Co-op members may also purchase prepaid points to supplement their chosen meal-plan options.

Members eat in convenient dining rooms, located in the residential areas or on the central campus, and are free to select the dining rooms of their choice for each meal. All dining rooms serve a variety of entrées (including one vegetarian entrée at both lunch and dinner) each day. In addition, "prime nights" and special highlights highlight the Co-op Dining program. Specials may include outdoor barbecues, midnight breakfasts, ice cream sprees, or the Cross-Country Gourmet dinner series, which has won national acclaim. Menus are posted weekly, and additional information is available through a special menu-information telephone line, 256-DINE.

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, intermission, spring recess, and summer.

The Co-op Dining program is administered by Cornell Dining, 233 Day Hall (telephone: 256-5392). Each year, all new and transfer students receive a program description and contract. All terms and conditions of the Co-op Dining program are given in the contract, which all prospective members should read carefully before completing and mailing the application.

Other Dining Services

Dining at Cornell is not limited to the Co-op Dining program. Students who do not choose to join a dining 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-a-la-carte service is available at five Cornell Dining locations seven days a week, throughout each day. The two newest dining options are the Red Bear Café 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, intermission, and spring break.

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

Vending operations provide food, beverage, and snack items in many campus buildings (telephone: 256-5386).

Catering

Cornell Catering serves the entire Cornell community, either in its private dining rooms, located on the third floor of Robert Purcell Union, or at functions held in many campus locations. Cornell Catering offers food service for a variety of occasions or needs (telephone: 256-5555).

Kosher Dining

Kosher meals are offered under the auspices of Young Israel of Cornell. Meals are served seven days a week under a wide variety of meal-plan options. Further information is available by writing to the Steward, Young Israel of Cornell, 106 West Avenue, Ithaca, New York 14853.

University Health Services

The University Health Services provides comprehensive medical care for all full-time undergraduate and graduate students enrolled at Cornell University in Ithaca. Gannett Health Center, located at 10 Central Avenue adjacent to Willard Straight Hall, is open twenty-four hours a day during the school year and available for overnight care and emergency outpatient service outside of normal working hours. Normal hours are Monday through Friday from 8:30 to 11:30 a.m. and from 1:00 to 4:30 p.m., and Saturday from 8:30 a.m. to 12:30 p.m.

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

For a medical appointment, a student should call 256-4082 or go to the center. For an appointment at the Psychological Services, call 256-5208 or go to the offices at the center. A doctor is available for emergencies twenty-four hours a day (telephone: 256-5155).

The tuition charge covers the cost of the following services for the academic year:
1) unlimited visits to Gannett Health Center
2) overnight care
3) routine diagnostic and X-ray examinations as ordered by Health Services clinicians and performed by Health Services staff
4) physical therapy services
5) counseling services at the center and in the Psychological Service

Some expenses not covered by the University Health Services program are visits to private physicians or private health care facilities; house calls; hospitalization expenses, hospital charges and fees for surgical procedures, fees for eye examinations for glasses; allergy injections; immunization vaccines and inoculations for travel abroad; initial contraceptive examinations; physical examinations for studies elsewhere or for fellowship applications; expenses for prenatals or obstetrical care; and expenses connected with illness or injury occurring (a) outside of Ithaca while in transit to and from college, (b) on vacation 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 absence are automatically enrolled in an accident and sickness insurance plan, underwritten by a private insurance company that includes a $20,000 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. 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, or at University registration, will students not be covered and not charged for this plan. The cost of this plan for 1983-84 will be approximately $140 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. If the waiver process has been completed, a student may be reinstated if the parent's 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 house program may be obtained by writing to the center or visiting the University Health Services, Gannett Health Center, Cornell University, 10 Central Avenue, Ithaca, New York 14853.

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 convocations, 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 advisers, available day or night for consultation, can be reached through the office, 118 Anabel Taylor Hall (telephone: 256-4214). This office also has information concerning weekly religious convocations 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 (CREASEP), 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. These bodies are reflections of 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 stores, 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 residence members, and has legislative authority over the policies of the departments of Dining, Residence Life, Unions and Activities, and the Office of the Dean of Students. 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 and submit University policies affecting the employment environment, including such matters as education/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, 185 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 office is 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 nonetheless it is always ready to hear and investigate complaints at any time. The office does not have the authority to reverse decisions or punish anyone. The office does, however, provide legal counseling and legal assistance to those accused of violating University rules and regulations, including academic integrity violations.

The Office of the Judicial Adviser 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 Adviser is located in B12 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 adviser can be reached when the office is not open. Further information about the Office of the Judicial Adviser can be obtained by calling that office.

Judicial System

The judicial administrator's office receives and investigates complaints brought by students, other members of the University, and offices on campus involving alleged violations of the Campus Code of Conduct or the Statement of Student Rights. The judicial administrator may also initiate investigations if there is reasonable cause to believe that a violation has occurred. The judicial administrator files charges and reminds the defendant of the services of the judicial adviser. 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 fine or a remedy, or both, that the parties to the case choose to accept. Either the defendant or the judicial administrator may, however, decide instead to take the case to a formal hearing. A complainant who is dissatisfied with the judicial administrator's action in a complaint may appeal that action to the University Hearing Board, which then decides whether or not to refer the case to an adjudicatory hearing.

Questions about the judicial system should be directed to the Office of the Judicial Administrator, 431 Day Hall (256-4880); hours are 9:00 a.m. to 4:30 p.m. Monday through Thursday, and 9:00 a.m. to 4:00 p.m. Friday. The Policy Notebook and Digest for Students, Faculty, and Staff may be obtained from the Office of the Dean of Students, details the principles and policies governing campus conduct. For further information, consult the staff in the Office of the Dean of Students.

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 38 percent of the men undergraduate students, as members. There are thirteen sororities, with about twelve hundred students, or 23 percent of the women undergraduates, as members. Each chapter has its own flavor and environment.

As one of the largest systems in the country, diversity is the key to its continuing growth. While satisfying room and board needs, 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.

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 Unions Program Board, which presents major lectures, touring theatrical productions, and major social events, including Mardi Gras and Springfest; Wilderness Reflections, which presents summer orientation programs for new students in an outdoor setting; and the Third World Student Programming Board, which presents events to highlight minority and ethnic 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. to 11:00 p.m., 7 days a week
Noyes Center
10:00 a.m. to 12:30 a.m., Sunday–Thursday
10:00 a.m. to 1:30 a.m., Friday and Saturday
(Building opens for dining earlier)
Robert Purcell Union
7:00 a.m. to 2:00 p.m., Monday–Saturday
7:00 a.m. to 1:00 p.m., Sunday
(Hungry Bear Diner: 10:00 p.m. to 3:00 a.m. daily; Sundays 2:00–5:30 p.m.)

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 person, 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. 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.

Camps tours originate from the Information and Referral Center Monday through Friday at 11:15 a.m. and 1:30 p.m. Saturday at 11:15 a.m. and Sunday at 1:00 p.m. From November 1 through March 31 the weekday tours are given at 1:30 p.m. only.

In Willard Straight Hall there is an information desk known as the Straight Desk. It differs from the Information and Referral Center in that it does not have a library of free literature and does not conduct tours. It does, however, sell snacks, magazines, and newspapers. The Straight Desk is open from 8:00 a.m. to 10:00 p.m. Monday through Friday; 9:00 a.m. to 10:00 p.m. on Saturdays; and 10:00 a.m. to 10:00 p.m. on Sundays. The telephone number is 607/256-3450.
Transportation Services

Traffic and Parking

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

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

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

All members of the campus community (students, faculty staff, and employees of non-University agencies located on 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 rapidly identified and contacted if necessary; for example, if a parked vehicle is involved in an accident, must be moved immediately, or has been left with its lights on. There is no charge for vehicle registration; however, a registration sticker is not in itself a parking permit.

Information on traffic and parking regulations, and parking permits, are available at the traffic and information booths on campus and at the Traffic Bureau on Maple Avenue. The bureau will be glad to assist any individual with general inquiries or special problems and requests (telephone: 256-4600).

Bus service. A campus bus service operates between peripheral lots and the central campus. Several community bus routes connect the University with surrounding residential and commercial areas.

Information about the campus bus system may be obtained from the Campus Bus Service (telephone: 256-3782). Schedules for on-campus and off-campus service are posted in all bus-stop shelters and are also 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 to 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 10:00 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.

University Services Bureau

The University Services Bureau is responsible for scheduling and staffing extra-University functions that require public safety personnel for traffic direction or crowd control. The manager of the University Services Bureau 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 256-7302.

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.

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 nonregistered 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>$50</td>
</tr>
<tr>
<td>4 weeks</td>
<td>60</td>
</tr>
<tr>
<td>5 weeks</td>
<td>70</td>
</tr>
<tr>
<td>6 weeks</td>
<td>80</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. The forms are processed, and 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.

Students who fail to submit a course enrollment form during the designated period may be charged a late fee. The fees are listed in the chart in the following section.
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 chart below for 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>*</td>
<td>*</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>Summer Session and Extramural Courses</td>
<td>†</td>
<td>†</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 Courses brochure for fees.

Class Schedules and Attendance

Class Attendance and Absences

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

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

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

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

Schedule for Classes Longer Than Fifty Minutes

1 Hour and 55 Minutes
- 8:00 a.m. - 9:55 a.m.
- 10:10 a.m. - 12:05 p.m.
- 12:20 p.m. - 2:15 p.m.
- 2:30 p.m. - 4:25 p.m.
- 3:40 p.m. - 5:35 p.m.

2 Hours and 25 Minutes
- 7:30 a.m. - 9:55 a.m.
- 10:10 a.m. - 12:35 p.m.
- 2:00 p.m. - 4:25 p.m.
- 3:40 p.m. - 6:05 p.m.

3 Hours
- 8:00 a.m. - 11:05 a.m.
- 10:10 a.m. - 1:10 p.m.
- 1:25 p.m. - 4:25 p.m.
- 7:15 p.m. - 10:15 p.m.

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 classroom instruction.

Examinations are held on Monday and Wednesday and on regular class days in various combinations.

Final Examinations

Final examinations for undergraduate courses are scheduled by the Office of the University Registrar. Examinations may be one, two, or 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 periods, except by the express permission of the dean of the faculty in accordance with existing faculty legislation.

Auditing Courses

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

Leaves and Withdrawals

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

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

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 serving college of the acceptance of admission within seven days of the offer of admission. Students interested in transfer within the University should consult with the appropriate school or college office.

Privacy of Records

According to federal law, grades are restricted information and may be released only to the student or at the student's written request. Thus grades earned on examinations or in courses may not be posted by name. Posting by student ID number is permissible. Graded papers and examinations, if returned, must be returned to individual students and should not be accessible to anyone but the author. For example, setting batches of papers and examinations in a box or on a table is inappropriate and illegal.

Course Numbering System

The course levels have been assigned as follows:

100-Level Course—Introductory course, no prerequisites, open to all qualified students.
200-Level Course—lower-division course, open to freshmen and sophomores, may have prerequisites.

300-Level Course—upper-division course, open to juniors and seniors, prerequisites.

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

500-Level Course—professional level (e.g., B&PA, Law, Vet.).

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

700-Level Course—graduate-level course.

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

900-Level Course—doctoral level, thesis, research.

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
Engineering
Hotel Administration
Human Ecology
Industrial and Labor Relations
Nutritional Sciences
Officer Education

Group 2: Graduate professional divisions

Business and Public Administration
Law
Veterinary Medicine

There are no courses offered by the Graduate School as a unit; graduate-level courses are contained in the following 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:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Quality Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>4.3</td>
</tr>
<tr>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>A–</td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>B–</td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>2.0</td>
</tr>
<tr>
<td>C–</td>
<td>1.7</td>
</tr>
<tr>
<td>D+</td>
<td>1.3</td>
</tr>
<tr>
<td>D</td>
<td>1.0</td>
</tr>
<tr>
<td>D–</td>
<td>0.7</td>
</tr>
<tr>
<td>F</td>
<td>0.0</td>
</tr>
</tbody>
</table>

This is how a term average is computed:

\[
\text{Term Average} = \frac{\sum (\text{Quality Points} \times \text{Credits})}{\text{Total Credits}}
\]

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 which 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.
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 or by 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. See the Department of Physical Education or your 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 and Digest for Students, Faculty and Staff. Copies of this booklet are available in the Office of the Dean of Students. 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 necessary to complete 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 and Digest for Students, Faculty and Staff for details of University policy.

Bursar Information

Tuition, Fees, and Expenses

Tuition for Academic Year 1983–84

Endowed Divisions

<table>
<thead>
<tr>
<th>Division</th>
<th>Undergraduate</th>
<th>Graduate School (with major chairman in an endowed division)</th>
<th>Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New York resident*</td>
<td>Nonresident*</td>
<td>New York resident*</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>$3,740</td>
<td>$6,050</td>
<td>$9,500</td>
</tr>
<tr>
<td>Agriculture and Life Sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Ecology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial and Labor Relations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York resident*</td>
<td>$3,740</td>
<td>$6,050</td>
<td>$9,500</td>
</tr>
<tr>
<td>Nonresident*</td>
<td>$6,050</td>
<td>$8,050</td>
<td>$11,750</td>
</tr>
<tr>
<td>Graduate School—Veterinary medicine</td>
<td>$4,310</td>
<td>$6,350</td>
<td>$8,900</td>
</tr>
<tr>
<td>Professional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veterinary medicine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York resident*</td>
<td>$6,350</td>
<td>$7,590</td>
<td>$11,450</td>
</tr>
<tr>
<td>Nonresident*</td>
<td>$7,590</td>
<td>$9,850</td>
<td>$14,450</td>
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</tbody>
</table>

Summer Session

<table>
<thead>
<tr>
<th>Division</th>
<th>Per credit</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$180</td>
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</tbody>
</table>

Extramural Division

<table>
<thead>
<tr>
<th>Division</th>
<th>Per credit</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$213</td>
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</tbody>
</table>

Other Tuition and Fees

<table>
<thead>
<tr>
<th>Division</th>
<th>Per term</th>
<th>Per credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>In absentia fees</td>
<td>$200</td>
<td>$12.50</td>
</tr>
<tr>
<td>Graduate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B&amp;PA and Law</td>
<td></td>
<td>$75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excess hours tuition</td>
<td>$210</td>
<td>$12.50</td>
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<tr>
<td>rate for students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in statutory units</td>
<td></td>
<td></td>
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<tr>
<td>taking extra endowed</td>
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<tr>
<td>credits</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>The amount, time,</td>
<td>$210</td>
<td>$12.50</td>
</tr>
<tr>
<td>and manner of payment</td>
<td></td>
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<tr>
<td>of tuition, fees, or</td>
<td></td>
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<tr>
<td>other charges may</td>
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<tr>
<td>be changed at any</td>
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<td></td>
</tr>
<tr>
<td>time without notice</td>
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</tr>
</tbody>
</table>

*Residency status is determined by the college.
Fees and Expenses

Undergraduate applicants to Cornell pay a nonrefundable $35 application fee when submitting an application for admission. The graduate application fee is $35.

Acceptance Deposit

Starting in the fall of 1983, an acceptance deposit of $200, applicable to the University charges for the final semester at Cornell, will be required. 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. This acceptance deposit only affects undergraduate students entering Cornell in the fall of 1983 or in subsequent semesters.

Refund Policies

Part of the amount personally paid for tuition will be refunded if the student obtains an official certificate of Leave of Absence or Withdrawal from the office of the dean or director of the academic division involved. Students who terminate their registration with the University during a regular term in this manner will be charged tuition from the University registration day to the effective date of the certificate as follows: first week, 10 percent; second week, 20 percent; third week, 30 percent; fourth week, 40 percent; fifth week, 60 percent; sixth week, 80 percent; seventh week and thereafter, 100 percent. No charge will be made if the effective date is within the first six days, including University registration day.

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 Information

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 charges are billed.

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

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

Payments

An individual who has outstanding indebtedness to the University will not be allowed to register or re-register in the University. Receive a transcript of record, have academic credits certified, be granted a leave of absence, or have a degree conferred. If students' bills show a previous unpaid balance, they must arrange for payment by August 16 if they plan to register for the fall semester. University policy precludes the use of any 1983-84 financial aid for payment of past-due charges.

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

For further information, students should contact the Office of the Bursar, Cornell University, 260 Day Hall, Ithaca, New York 14853 (telephone: 607/256-2336).

Cornell Installment Plan (CIP)

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

Multiple-Year Tuition Prepayment Plan

This plan is available to the parents of students who are not financial aid recipients. Two, three, or four years' tuition may be paid at the tuition rate in effect for the next full school year. Future tuition increases do not affect participants for the duration of their prepayment plan. For further information, interested persons should contact the Office of the Bursar, Cornell University, 260 Day Hall, Ithaca, New York 14853 (telephone: 607/256-2336).

Medical Insurance

The medical insurance charge on the August billing statement is for insurance for hospitalization, surgical fees, and major medical coverage for the period of August 29, 1983 through August 28, 1984. The cost of this insurance is lower than the average cost of comparable coverage under other group accident and health insurance policies.

For those who do not want medical insurance coverage, a medical insurance waiver form (included with the August statement) must be completed and returned no later than September 28, 1983. Waver cannot be processed after this date.

Tuition Insurance

To provide a more comprehensive refund program, Cornell makes available the Tuition Refund Plan. This plan provides refunds for 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 $10. Itemized monthly statements, which are mailed to students, must be paid by the due date on the statement, or finance charges of 1% 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 month's 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 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 $10 returned-check charge. These charges will be subject to a finance charge at the rate of 1% 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.
Programs of Financial Assistance

Cornell University offers a variety of scholarships, grants, employment opportunities, and loans to students who could not otherwise attend the University. To ensure that no qualified applicant is prevented from enrolling owing to lack of funds, Cornell has developed a comprehensive financial aid program. Since the requirements and application procedures for the various programs are complex, it is important for students to read the financial aid information sheet put out by the Office of Financial Aid every spring and usually available in April or May. Questions about any aspect of applying for awards, the award announcement, and program provisions are welcome at the Office of Financial Aid, Cornell University, 203 Day Hall, Ithaca, New York 14853.

To be eligible for need-based assistance, a student must be enrolled full-time in a degree program at Cornell, 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 previously received to attend Cornell. Students on leave 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 students applying for aid for the first time are considered on the basis of remaining funds.

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

Applications for the 1984–85 academic year will be available from the Office of Financial Aid in December. Whether or not they are already receiving aid, undergraduates must submit applications by March 15, 1984. Students should consult the brochure Financial Aid Information, 1983–84, for further information.

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

- Undergraduate and graduate students: Office of Financial Aid, Cornell University, 203 Day Hall, Ithaca, New York 14853 (607/256-5145)
- International students: International Student Office, Cornell University, 219 Barnes Hall, Ithaca, New York 14853 (607/256-5243)

Non-University Financial Aid

State loan proceeds will usually be disbursed by a check made payable to the student and Cornell University for the entire amount. The Office of the Bursar will credit this amount to the student's account when the check is submitted. Finance changes on state loan amounts are not waived unless Cornell is responsible for late processing.

National Merit Scholarships are paid to the student in the form of a check drawn by the National Merit Corporation and sent to the Office of Financial Aid. If students wish to apply the amount of the award toward payment of their bill, they must personally pick up the check from the Office of Financial Aid, 203 Day Hall, and present it to the cashier, 260 Day Hall. The National Merit Corporation has requested that the University not process its checks through use of power of attorney.

Other scholarships from sources outside the University are credited to the initial bill if they have been received prior to the date the bill is prepared. Outside awards received after the initial billing will be applied towards unpaid charges as they are received. Any finance charges caused by late receipt of these awards will be the student's responsibility. It is important, therefore, that the student arrange with any outside scholarship donors to have awards mailed to the University Office of Financial Aid as promptly as possible.

If non-University scholarships have been received and all charges have been paid, a check will be issued in the name of the student. These checks may be picked up in 260 Day Hall.

Please remember that undergraduate students receiving aid from the University must personally report receipt of any outside scholarship sources to the Office of Financial Aid.

New York State Tuition Assistance Program (TAP)

New York State residents whose New York State net taxable income for 1982 was $25,000 or less are, upon application to the New York State Higher Education Services Corporation (NYHESC), eligible to receive a Tuition Assistance Program (TAP) award. Students from families with higher income levels may also qualify for an award based on the availability of additional children in college. TAP awards can range from $100 to $1,100 per semester. Students must apply annually for their awards by completing a TAP application and mailing it to NYHESC.

An award certificate will be sent by NYHESC informing applicants of their award eligibility. A copy of the award certificate must be submitted 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 for each recipient and that each 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: enrollment for 12 credits or more per semester.

Good academic standing: Students receiving awards must meet the following provisions to maintain good academic standing.

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

2) Satisfactory academic progress: Each recipient must maintain eligibility to enroll each semester in his or her degree-granting college.

Any New York State resident receiving a tuition benefit administered by Cornell is obligated 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.

This program is administered by the Office of the Bursar, 260 Day Hall (telephone: 607/256-6414).

Orientation Sessions

Although attendance at orientation sessions is not required, the Office of Financial Aid strongly recommends that all new undergraduate recipients of aid and their parents attend the financial aid orientation session included in the Cornell orientation program. The orientation schedule should be consulted for dates and times of the session.

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 as a guide.

Brochures are available describing housing on and off campus and dining plans.

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

Degrees will not be conferred and transcripts will not be sent until all University charges, including Cornellicard, are paid.

Financial Counseling Services

Financial Aid Information Resources is a group of work-study students. These peer counselors can answer financial aid questions and give advice on financial aid problems. To contact a student counselor, students should come to the Office of Financial Aid.

If students have any questions about financial aid or need assistance in budgeting, they should contact the Office of Financial Aid, Cornell University, 203 Day Hall, Ithaca, New York 14853.

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

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

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

Administration

David L. Call, dean
Kenneth E. Wing, associate dean
George J. Conneman, director of instruction
Helen L. Wardseberg, associate director of instruction
Theodore L. Hurler, director of research and director of the New York State Agricultural Experiment Station (Ithaca)
Lamarine F. Hood, associate director of research
James J. Zoches, 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, Eunice Paddock-Reed
Minority affairs: Cathy Thompson
Records: Tom Waksula
Registrar: Ruth Stanton
Scheduling: Cathy Place
Admissions: Richard Church, Mary Grainger, Nancy Rehkugler
Career development: William Alberta

Department Chairmen

Agricultural economics: O. D. Forker, Warren Hall
Agricultural engineering: N. R. Scott, Riley-Robb Hall
Agronomy: R. F. Lucey, Emerson Hall
Animal science: R. J. Young, Morrison Hall
Communication arts: D. F. Schwartz, Roberts Hall
Education: J. P. Ball, Stone Hall
Entomology: M. J. Tauber, Comstock Hall
Floriculture and ornamental horticulture: C. F. Gortzig, Plant Sciences Building
Food science: J. E. Kinsella, Stocking Hall
Microbiology: R. P. Mortrock, Stocking Hall
Natural resources: R. T. Oglesby, Fernow Hall
Plant breeding and biometry: W. D. Pardee, Emerson Hall
Plant pathology: W. E. Fry, Plant Sciences Building
Pomology: G. H. Oberly, Plant Sciences Building
Poultry and avian sciences: R. C. Baker, Rice Hall
Rural sociology: E. C. Erickson, Warren Hall
Statistics and biometry: W. T. Federer, Warren Hall
Vegetable crops: E. E. Ewing, Plant Sciences Building

Facilities

The College of Agriculture and Life Sciences (CALS) 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 and is commonly known as the Ag Quad. Anchored on the East by Mann Library, the quadrangle buildings house classrooms, offices, and laboratories and are flanked by the greenhouses, gardens, and research facilities. Nearby are the orchards, barns, field plots, forests, and streams that extend as far as the Animal Science Teaching Research Center at Harford and the Experiment Station at Geneva.

Administrative units, including the dean's office and the Office of Instruction, are located in Roberts Hall. Information about academic programs, student records, graduation requirements, career planning, financial aid, placement, and counseling may be obtained there. The student lounge and service center of the college is in the Alfalfa Room, across the Ag Quad in Warren Hall. Computer facilities are available in 160 Warren Hall and in 15A Riley-Robb.

Advising and Counseling Services

Faculty in the College of Agriculture and Life Sciences recognize that students need information and advice to make intelligent decisions while in college. Each student is assigned to a faculty adviser soon after being admitted to the college. An effort is made to match the student's and the faculty member's interests as closely as possible.

The Office of Student Services has overall responsibility for coordinating the college advising and academic counseling program. Inquiries regarding procedures and services should be directed to Dr. Donald Burgett, 17 Roberts Hall (telephone: 256-2257). Students may change advisers if their academic interests change or if they feel their needs can be better served. Change of Adviser forms are available from this office. The minority students in the College of Agriculture and Life Sciences, in conjunction with the University-wide COSEP program, receive counseling, tutoring, advising, and referral to agencies that will meet their special needs. The Educational Opportunity Program (EOP) is a state-supported program intended to assist New York State students who meet specific economic and academic criteria set by the New York State Education Department. Students in the College of Agriculture and Life Sciences who are eligible should apply to the program. Forms are available in 17 Roberts Hall (telephone: 256-6588).

The Office of Career Development offers a variety of services to all students and alumni of the college. For further information, students should contact William Alberta (telephone: 256-2215).

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.

The progress of each student toward meeting the degree requirements is recorded in the College Registrar's office on a Summary of Record form. Worksheets are available on which students can keep their own record of courses taken toward meeting the distribution and elective requirements. Data on the worksheets can be used by the student in planning course selection each term to assure reasonable progress toward meeting degree requirements.

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.

Financial Aid

Financial aid is administered through the University office in Day Hall. Endowment funds and annual donations provide supplemental aid for students in the college. Awards recommended by the College Scholarship Committee become part of the total financial package offered through the University's Office of Financial Aid.

A small loan fund is administered by the college through the Office of Instruction. The purpose of the fund is to assist students facing short-term emergencies. The loans are interest free and are usually made for no more than ninety days. For information, students may contact the Office of Instruction at 256-4569 or 256-2257.

Students

The CALS undergraduate enrollment is 3000, with about 60 percent comprised of freshmen. Each year about 850 students are graduated, while 600 freshmen and 250 transfer students are admitted. Over 300 faculty members serve as advisers for undergraduates. About 1000 graduate students have members of the faculty of the college who serve as chairmen of 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.

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 7 percent are identified as members of minority-ethnic groups.

Transfer Students

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

Other transfer students, including those from other colleges at Cornell, may also be admitted. A Cornell student in good standing may apply for intra-University transfer to pursue a course of study unavailable in his or her current college. Guidelines are available in the Admissions Office of the College of Agriculture and Life Sciences, 195 Roberts Hall.

The procedure includes filing a transfer request in the Office of the University Registrar, 222 Day Hall, and submitting a letter explaining reasons for making the transfer.

Consideration is given to students who have demonstrated an interest in their intended field of study by taking appropriate prerequisite courses and courses within this area of study. Academic achievement is also considered. Students are seldom allowed to transfer during their freshman year. In some cases, students may transfer directly into CALS. In other cases, the student may be referred to the Division of Unclassified Students to study for one semester before entering the college. A second semester is considered under unusual circumstances. During this trial semester the student must achieve a predetermined average (usually 2.7) and take approved courses to assure acceptance.

Special Students

A limited number of non-degree candidates who want to take selected courses in the college are admitted each year. Applicants should submit the standard Cornell application, a résumé of their work experience, and an outline of the courses they want to take. For more information, students should contact the Admissions Office, 195 Roberts Hall (telephone: 256-2036).

Part-Time Study

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).
The Bachelor of Science Degree
To qualify for the Bachelor of Science degree, students must fulfill requirements established by the faculty of the College of Agriculture and Life Sciences and administered through the Office of Instruction.

Summary of Basic College Requirements for Graduation
1. Minimum number of credit hours: 120. A minimum of 100 credits with letter grades; a minimum of 45 credits in CALS courses.
2. Residence: Eight full-time terms of residence are normally required to complete the program of study. Students may graduate in less than eight semesters if all of the requirements for the degree are met. A maximum of 15 credits in one term may be transferred for full-time attendance at another college, but at least 60 credits must be taken at Cornell. The intra-University transfer student must complete a minimum of two semesters in CALS and complete 30 credits, at least 20 of which must be earned in courses taught in CALS.

A student must enroll for and satisfactorily complete a minimum of 12 credits per term to remain in good standing. The typical program is 15 credits per term for eight semesters.

3. Distribution: 45 credits. A minimum of 12 credits per term to remain in good standing. The typical program is 15 credits per term for eight semesters.

Group A: Physical Sciences
Select at least two subjects, including 6 credits in one of the first three areas:
a. Chemistry
b. Mathematics: includes ALS 115; excludes Mathematics 109

Graduate study is organized under graduate fields, which generally coincide with the department. Graduate degree requirements are described in the Announcement of the Graduate School. Degree programs offered in the college are listed below.
c. Physics: except 201 - 205

d. Other: Agricultural Engineering 206 - 208; Astronomy 101 - 102; 103 - 104, Agronomy 101; Geology: 100 level only

Group B: Biological Sciences

Select at least two subjects, including 6 credits in the first area:

a. Introductory biological science
b. Any course in the Division of Biological Sciences except Biological Sciences 108, 201 - 202, 205 - 206, 301 - 302
c. Other: Animal Sciences 200, 220, 221; Chemistry 251 - 253, 357 - 358; Entomology 212; Microbiology except Microbiology 100; Plant Breeding 225; Plant Pathology 300, 301, 309

Group C: Social Sciences and Humanities

Select 100-, 200-, or 300-level courses in at least two subjects. A list of courses in various subjects approved by the faculty is available in 192 Roberts Hall.

a. Social sciences: anthropology, economics, government, history, psychology, sociology
b. Humanities: art, languages, literature, music, philosophy, theater

c. Other: Animal Sciences 200, 220, 221; Chemistry 251-253, 357-358; Entomology 212; Microbiology except Microbiology 100; Plant Breeding 225; Plant Pathology 300, 301, 309

Group D: Written and Oral Expression

Select at least 6 credits in written expression and one course in either oral or written expression.

a. Freshman Seminars
b. Africana Studies 137 - 138
cc. Communication Arts 114; 301 - 302, 360, 363, 365
d. Education 403
e. English 260, 261, 285, 286, 289

The basic competencies and skills needed for the various courses of study are usually acquired through selected courses that fulfill the distribution requirements. Students should consult with their faculty advisor to be sure necessary prerequisite courses are selected for the specialization. Generally speaking, the distribution requirements should be largely completed in the first two years of study, with courses in the specialization being concentrated in the upper division.

4. Mathematics: A minimum competency in the fundamentals of mathematics is a requisite to satisfactory pursuit of a degree. Hence, the faculty of the college requires that all CALS students complete, with a passing grade, one course in mathematics as part of the Physical Sciences, Group A, distribution requirements. Either credit in mathematics or transfer credit in a college calculus course may be presented to meet the requirement in Group A.

a. The CALS Mathematics Placement Test index score is used to determine competency and help students select appropriate college mathematics courses. The test is administered just prior to registration each semester.

All entering undergraduates except those presenting advanced placement credit or transfer credit in college calculus are required to take the placement test. The test may not be repeated by any student. The placement test consists of fifty questions sampled from arithmetic, algebra, geometry, trigonometry, and a smattering of calculus. The index score is determined by the number of correct answers minus one quarter of the number of incorrect answers.

If a high index score (currently equal to or greater than 30) is attained, the mathematics requirement in Group A is waived. If a low index score (currently equal to or less than 12) is attained, the student should enroll in ALS 005 before selecting a mathematics course for Group A.

b. When presenting mathematics transfer credit in Group A, the student may:

1. Include precalculus credits along with the calculus credits
2. Transfer 6 credits, if the index score is 30 or above
3. Not transfer any credit to Group A. If the index score is from 13 to 30. (Credit may, however, be counted toward graduation.)
4. Not transfer any credit in mathematics, if the index score is below 13

The mathematics requirement should be completed at least by the end of the sophomore year or, for transfer students, by the end of the first year in residence. It is the responsibility of the student to plan a program of study in consultation with the faculty advisor that meets the college requirement in mathematics and that will provide adequate prerequisites in the area of specialization.

5. Electives: 75 credits. A minimum of 45 credits must be selected from courses offered in CALS, and another 10 credits must be in the statutory units, including CALS. Electives should be used to meet requirements of the program area and specialization. Core and sequence courses for the various programs of study are on pages 31 - 36. The remaining 20 credits needed to complete the graduation requirements may be taken in any college, including CALS. Students who exceed 20 credits in the upper division will be charged excess tuition at the set rate per credit (currently $210).

6. Grade-point average (GPA): A cumulative GPA and last-term average of 1.7 or above must be maintained. Only grades earned at Cornell and while registered in CALS are included in the cumulative average. To graduate in fewer than eight terms, a cumulative average of at least 2.0 is required.

7. Physical Education: Completion of the University requirement (see p. 23). The credit received for physical education does not count toward the 120 hours required for graduation. Transfer students receive credit towards this requirement for as many terms as they have been enrolled full time in another institution. Requests for postponement or exemption should be made in writing to the University Faculty Committee on Physical Education. Questions should be referred to Mr. Alan Gantert, Teagle Hall (telephone: 256-4268).

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

Academic Procedures and Policies

Procedures for University registration and course enrollment are described on page 20. To enroll in courses, CALS students pick up materials from the Scheduling Office, 192 Roberts Hall, on an official form provided for that purpose. When a student submits a properly signed course change form, the change is made on the official class lists by the Scheduling Office.

An official add/drop/change period is designated each term on the University calendar. CALS students may add courses during the first three weeks of the term and may drop courses until the end of the sixth week, after consultation and with approval of the adviser, by filing the properly signed forms in the Scheduling Office. Signatures are required to add or to drop a course.

Beginning with the seventh week of the semester, CALS students wishing to withdraw from a course must petition to the Committee on Academic Achievements and Petitions. A special petition form for course changes is available in 17 Roberts Hall. Requests for course changes are approved only when the members of the committee are convinced that there are unusual circumstances that make it necessary to officially change such enrollment. All changes in courses or credit hours or grading option must be made by the student at the Scheduling Office, 192 Roberts Hall, on an official form provided for that purpose. When a student submits a properly signed course change form, the change is made on the official class lists by the Scheduling Office.

Enrollment in courses that involve independent study, teaching, or research, the student must complete an Independent Study Statement, available in 192 Roberts Hall, and submit it with the course schedule. Students who will be studying off campus should file the Intent to Study Off Campus form with the college registrar to ensure that proper registration will occur. All students should construct a schedule that is appropriate and shows progress toward completing their specialization as well as the graduation requirements.

Off-Campus Study

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.

Programs in which students study off campus but enroll for Cornell credit include: Sea semester, field study in human ecology or industrial labor relations, Albany programs, Cornell-in-Washington, student teaching, JPM internship, and clinical microbiology internship. An Intent to Study Off Campus form is available from the College Registrar in 192 Roberts Hall. All students intending to receive Cornell credit for work done off campus should file this form with the college registrar at the time of enrolling for courses to ensure that proper registration will occur. In some programs, adjustment in tuition is made to compensate for the reduced use of on-campus facilities.

Students who plan to enroll in courses at another institution in the United States or abroad, including those enrolling 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 ensure that it is appropriate to the student's academic program. Approval of the 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.
The 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:

- receives and acts upon petitions from individual students asking for exceptions from particular academic regulations or requirements of the college, or for consideration of action previously taken by the committee;
- reviews, at the end of each semester and at other times as shall seem appropriate to the committee, the progress of all students in meeting academic requirements;
- in case of students not making satisfactory progress, takes appropriate action, including, but not limited to, the following: issuing warnings to students, suspending them, decreasing that they may not reregister, granting them leaves of absence, and allowing them to withdraw;
- acts upon readmission requests from persons whose previous enrollment was terminated by the committee;
- notifies the petitioner in writing of the action taken by the committee and sends a copy of such notice to the student's adviser.

The Committee on Academic Achievement and Petitions reviews the records of those students who in any respect are failing to meet the academic requirements of the college or who persistently fail to attend classes. In general terms, regular participation in course work with academic loads at a level sufficient to assure graduation within eight semesters and grades averaging C- or higher is prima facie evidence of satisfactory progress.

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 each semester, failure to achieve one or more of the following:

- semester GPA of at least 1.7
- cumulative GPA of at least 1.7
- passing 12 or more credits in academic subjects per semester
- reasonable progress toward completion of distribution requirements and all other college and University requirements in eight semesters.

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

### Petitioning Procedures

A student who has grounds to be exempt from a college academic regulation may submit a petition. Petition forms are available in the Office of Student Services, 17 Roberts Hall.

A petition is usually prepared with the assistance of the student's 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 petitioner that would warrant an exemption or other action. The adviser and the student are notified in writing of the committee decision.

### 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 Office of Admissions.

### Graduation

The student who completes requirements for the degree will be graduated. In preparation for graduation, the student should complete the Candidacy for Baccalaureate Degree form in the College Registrar's Office. Diplomas are prepared by the Office of the University Registrar and distributed by the college registrar 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 the fall term courses, is mailed to the student by the University without charge.

### Special Academic Opportunities

#### Honors Program

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

Undergraduates who wish to enroll in the honors program must have completed at least 55 credits, at least 30 of the 55 at Cornell. 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. The application form available from the college registrar must be completed.

The honors program will verify the student's grade-point average and formally enroll the student in the 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. The programs are described by area.

### Animal Science

Faculty Committee: W. R. Butler, chairman; R. L. Quaas, R. G. Warner

Program: Completion of the honors program in animal science requires the submission of a written report. This report is to be written in the style of a technical journal article. "Review of Literature." While it is expected that most students will undertake active research projects, a report 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 project.

It is expected that the work required for honors will be above and beyond the requirements of any course, including Animal Science 499. However, it is anticipated that many projects may grow out of work initiated under Animal Science 499 or other courses. Since application to the honors 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 chairman.

### Biological Sciences

Faculty committee: K. Niklas (plant biology), chairman; K. B. Bogen (animal physiology and anatomy), P. Hinke (biochemistry, molecular and cell biology), H. Howland (neurobiology and behavior), D. Pimentel (ecology and systematics), R. Wu (genetics and development), and H. Stinson (associate director), ex officio.

Program: Students will report on their research projects in two 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 must 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: E. W. Cump, chairman; C. O. Berg, E. J. Hagedorn, R. A. Morse, D. Pimentel, D. S. Berry, H. Stinson, ex officio.

Program: An honors program in the area of entomology may be pursued by any qualified student in CALS. The student must be specializing in entomology. Insects, because of their variety, small size, and easy availability, are convenient subjects for study in a wide array of problems dealing with living systems. Short life cycles, 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 expertise in entomology are also a major asset if one selects entomology as the area for honors study.

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

- Discuss the matter with his or her academic adviser to determine if time and effort can be allocated to such an undertaking.
- Discuss the project with an appropriate faculty member in the area of entomology. (The faculty adviser will be of assistance in determining which faculty entomologist might be the best to approach, 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 by the faculty adviser. This plan should include a determination of
support needed in such matters as space, equipment, time, and supplies. (CALS provides modest funds in support of projects upon application and submission of a budget proposal.)

• Prepare 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.

• Submit a brief progress report, approved by the project adviser, to the entomology honors committee by mid-term of the semester in which the student will complete his or her graduation requirements.

• Present a final project report, which is approved by the faculty member supervising the work, to the chairman of the entomology area honors committee no later than the last day of classes in the semester in which the student anticipates graduation.

Natural Resources

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

Program: 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 and depend on 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, we expect the student to do the following:

- Register for the honors program in the junior year.
- Select a faculty adviser who will help identify and formulate a research problem.
- Carry out an independent research effort that is original and separate from the work of others who may be investigating similar subjects.
- Describe and summarize the work in the format of a conventional manuscript, thesis or in the form of a scientific paper ready for journal submission. About half of our theses have been published.
- Work closely with at least two faculty or staff 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 departmental honors program committee.

Physical Science

Faculty committee: W. F. Shipe, chairman; D. A. Haith, D. J. Lattimer

Program: 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. They must also enroll in the appropriate departmental independent study course for a total of at least 6 credits.

Students 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 chairman of the physical science honors committee.

Plant Sciences

Faculty committee: E. A. Delwiche, chairman; C. C. Low, R. L. Obendorf, W. C. Kelly, R. P. Korf

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 chairman of the honors committee.

The report should be written in the format for research publication required by that discipline of plant sciences in which the student is enrolled. The report should be accompanied by a letter of recommendation from the supervisor of the research, that letter reflecting the supervisor's familiarity with the research, 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. Rockcastle, chairman; D. Goodrich, P. Garrett, J. Lawrence

Program: 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 or the arguments by which the results were achieved must 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 the work may originate in prior class work, it is expected that honors research will extend it. Students may, however, register for independent study in conjunction with an honors project.

Reports may be written according to the form of any standard journal within the appropriate fields. Three copies of the report should be submitted to the chairman of the honors committee two 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.

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 with a member or staff of the New York State Assembly. The Senate Assistants Program has placements with New York State Senators and selected staff. The Albany Semester Program provides experience with a state agency such as the Department of Environmental Conservation, Education, or Labor. 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 CALS Internship Committee in the term prior to assignments. Those accepted should plan a program of study in consultation with their faculty adviser during the preenrollment period. 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 CALS Internship Committee.

Independent study and research courses offered by the various departments in CALS and/or courses offered by academic institutions in the Albany area may be elected to complete a full course of study for the term.

The intent to Study off Campus form should be filed with the college registrar at the time of preenrollment for courses. Tuition is prorated for off-campus study; stipends to help defray living expenses are provided in each program. Students are requested to consult with the Office of Financial Aid prior to leaving campus.

None of the credits earned in the Albany program may be used to meet CALS distribution requirements; at least 12 credits must be carried to meet the resident requirement. Seniors 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.

Overseas Academic Programs

Several opportunities for study abroad are coordinated with the College of Agriculture and Life Sciences. These opportunities offer students a broadened educational program, a multicultural perspective, and possible new avenues of career development. Among the overseas programs available are 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 have enabled the college 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 be then transferred to meet requirements for graduation at Cornell in the normal time period. Students interested in these or other year-abroad programs may obtain additional information from the Office of Student Affairs.

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. Two students from Monterrey attend 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, partially supported by the college and student groups here.

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. For college 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 the life sciences. The variety of programs offered is in keeping with its mission "to increase our understanding of natural processes in the areas of agricultural sciences, biology, and the related natural resources and the environment, to educate citizens for activity and leadership in these areas, and to translate new knowledge into action for the well-being of the people, their agriculture, their resources, and the communities in which they live."

Every curriculum creditable toward a degree in the college is registered with the State Education Board and is linked with the national Higher Education General Information Survey (HEGIS) codes for federal and state reporting. Graduate study is organized by fields, which may draw faculty from several disciplines and departments in the colleges of the University. Major and minor subjects offered in each field are described in the Announcement of the Graduate School.

In 1973, to facilitate the student's choice of a major field of study, the many undergraduate options and specialties offered by CALS were organized into eight broad, relatively homogeneous program areas: agricultural and biological engineering, animal science, applied economics and business management, behavioral and social sciences, biological sciences, environmental studies, food science, and plant sciences. A ninth area includes a cluster of special programs.

Faculty curriculum committees in each program area identify a core or sequence of courses appropriate to all students in that field. The program area may be based in one department, or faculty from several departments may constitute the committee planning the sequence.

The program areas reflect the major academic effort in the college. Within each area, courses of study are designed to provide systematic development of basic skills and concepts and the opportunity for specialization in an area of particular interest to the student.

Programs are planned with considerable flexibility, allowing students to prepare for careers, further 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. Specific requirements are detailed in each program area.

Agricultural and Biological Engineering

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

Students study topics such as machinery, soil and water conservation, waste management, power and energy, structures and building design, bioengineering, records and reporting, environmental, agricultural, and environmental education, 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 have a strong aptitude for mathematics and physical sciences and high motivation. 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 accepted by the Engineer's Council for Professional Development. 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 the environment. Students may also prepare for work in governmental or non-governmental extension and development programs.

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 6
4. 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 or business management 3
2. Five agricultural engineering courses at the 300 level or above 15

Environmental technology is directed toward students with applied science and mathematical interests who have concern for the quality of the environment and a desire to deal with environmental-quality management problems from a technological perspective. The specialization combines basic training in physical and biological sciences, ecology, and environmental quality with a selection of courses oriented toward modern, well-equipped laboratories and, with their advisers, develop a curriculum that includes 12 credits in animal science. This includes 12 credits in basic courses, 6 credits in animal or poultry production, and 6 credits in advanced courses. Work experience is highly recommended.

Students preparing for graduate or advanced professional work in animal science should take upper-division courses in chemistry and biochemistry as well as in animal sciences in cytogenetics or animal breeding, forages, metals, swine or sheep, dairy cattle, artificial insemination, lactation, nutrition, and endocrinology.

Animal Sciences

Students in this program area study the breeding, care, and production of dairy and beef cattle, horses, poultry, pigs, and sheep. Basic and biological sciences are applied to animal industries to increase the supply of food and other products by animals. The animal science program is offered jointly by the Departments of Animal Science and Poultry Science. It is housed in Morrison Hall and with some facilities also in Rice Hall. The Animal Research and Teaching Center is located at Harford, New York.

Production courses are designed to provide some practical experience in animal production. Many species of animals are used for study and research, including dairy and beef cattle, horses, sheep, swine, chickens, turkey, ducks, mink, dogs, rabbits, rats, hamsters, guinea pigs, goats, and turtles. The program has excellent facilities for housing animals and modern, well-equipped laboratories and classrooms.

Students enroll in other basic and applied courses and, with their advisers, develop a curriculum that may include courses in animal nutrition; animal breeding and genetics; animal physiology; meat science; and dairy cattle, livestock, and poultry production. Students who want to enter veterinary college or graduate school take additional courses in chemistry, physics, biochemistry, microbiology, and mathematics.

Students can specialize in dairy, poultry, and livestock production; food and breeding genetics; meat science, animal physiology, and animal nutrition. In consultation with their advisers students may select sequences of courses tailored to their own interests. Students may prepare for careers in animal production or as technicians. Students whose interests and abilities warrant it are usually urged to emphasize the basic physical and biological sciences. This emphasis provides preparation for graduate study, admission to veterinary college, or careers in teaching or research in the more specialized disciplines of animal science.

Students are required to complete a minimum of 25 credits in animal science. This includes 12 credits in basic courses, 6 credits in animal or poultry production, and 6 credits in advanced courses. Work experience is highly recommended.

Students preparing for graduate or advanced professional work in animal science should take upper-division courses in chemistry and biochemistry as well as in animal sciences in cytogenetics or animal breeding, forages, metals, swine or sheep, dairy cattle, artificial insemination, lactation, nutrition, and endocrinology.
Applied Economics and Business Management

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

Students with outstanding academic records may apply to register in the Graduate School of Business and Public Administration in their senior year. For information, students may contact the Admissions Office, 315 Malott Hall.

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

Business management and marketing applies the principles of economics and the tools of management to prepare students for careers in business. Special emphasis is given to developing decision-making skills and to the study of the structure 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 the use and management of natural and human resources. Public affairs management integrates a wide 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 six core courses in the Department of Agricultural Economics and additional courses in an optional area of concentration.

Behavioral and Social Sciences

The behavioral and social sciences (BASS) are concerned with people, their society, and their environment. Knowledge developed in agriculture and life sciences is translated into programs affecting people and the environment in which they live and work, stressing the application of concepts to real-life situations.

The program is offered by three departments in the College—Communication Arts in Roberts Hall and Mann Hall; Education, in Stone Hall; and Rural Sociology, in Warren Hall.

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 comprehend the social psychology of human communication.

Students in the Department of Communication Arts study communication theory and practice. As a result, they learn both the social science underlying communication and the most effective means of adapting written, oral, and visual communication to their audiences.

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 five to seven courses, all of which includes Writing for the Mass Media, Theories of Human Communication, Introduction to Mass Media, and Oral Communication.

To prepare students for a career in a general area such as business, government, educational, or public service communication, or for a specific profession such as agribusiness, public relations, or science journalism, a concentration of at least 12 credits outside the department is required. This may be all in a single department or may be related courses in several departments. The concentration allows students to plan for an initial career field or type of position.

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

Public communication prepares students for careers as communication, information, or public relations specialists in a wide variety of settings. This would include agriculture, business, education, government, and community and social welfare organizations.

Required courses for this sequence are taken in communication planning and strategy, survey research, communication research, and visual communication. In addition, there is a heavy emphasis on writing skills.

Publication provides an excellent background in writing for a variety of markets. Students can select courses to provide them with skills as editors and writers in virtually any field, e.g., agricultural journalist, editor for organizational publications, science or technical writer.

Required courses for this sequence are taken in writing, media law, publication design, and communication theory. In addition, students serve as staff members for the Cornell Countryman for one or two terms.

Interpersonal communication coupled with a carefully designed concentration prepares students for careers in human service professions such as personnel administration, training, and a variety of sales and consulting positions. The sequence also prepares one for graduate study in communication and the allied social sciences.

Required courses for this sequence are taken in communication theory, human communication research, and writing. Electives include such courses as small-group communication, listening, persuasion, intercultural communication, and organizational 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 teaching and learning take place in school and nonschool settings, as well as 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 changes in educational programs in an effort to increase understanding of the substance and process of education so that human potentials can be realized.

Agricultural education is intended for students who have good academic ability, experience in agriculture, and an interest in young adults who would like to study agriculture. The ability to work and get along with people is essential. This is the only program in New York State leading to certification to teach agriculture in public schools.

The agricultural subjects are agribusiness, agricultural mechanization, conservation, farm production and management, horse handling and care, ornamental horticulture, and small animal science. Candidates must complete an approved curriculum leading to the baccalaureate degree, including a supervised teaching experience. During their sophomore year, students who are interested should consult Professor W. Drake, 212 Stone Hall, for technical and pedagogical requirements. Permanent certification requires graduate study.

Also available is a program that does not provide teacher certification. Students completing this specialization often find positions in businesses or industry, conduct demonstration programs. Some may enter fifth-year teacher-preparation programs.

Education. Students, in consultation with an adviser, plan a program that includes:

- One introductory course, either The Art of Teaching, or Educational Studies. Two courses selected from educational psychology, sociology of education, and general political or social philosophy of education.
- Field experience under the direct supervision of the student's adviser (or some other supervisor).
- Twelve to 15 credits of electives chosen from upper-division courses in education. These courses allow students to concentrate on a particular area or pursue special interests.

By selecting a science, mathematics, or environmental education sequence, students prepare for positions in environmental centers, museums, school systems, governmental agencies, youth organizations, private conservation organizations, or industrial groups. Each student will take about 50 credits in basic science, including both the biological and the physical sciences.

Students develop competence in communicating to audiences of varying ages in the public relations activities concerned with environmental quality and interpretation, and in transmitting ideas and reports through mass media.

Rural Sociology

Rural sociology trains students in the theory, methods, and applications of sociology in rural society, both domestic and international. Each student specializes in one of three areas: rural social organization and development, theory and policy, or methods and analysis. Such training provides a basis for sociology-related occupations and prepares undergraduates for more detailed graduate work in a number of rural development fields.

Each student must complete 24 credits of courses in rural sociology and a 3-credit course in statistics. Required rural sociology courses are: 100, Introduction to Sociology; or 101, Introduction to Rural Sociology; 105, Rural Sociology and World Development; 213, Introductory Research Methods; 356, Rural Society in America; and 404, Intermediate Sociological Theory.

Biological Sciences

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

Areas of concentration include general biology, animal physiology and anatomy; biochemistry; botany; cell biology; ecology; systematics, and...
evolution, genetics and development; neurobiology and behavior, and an independent option. Programs of study are described under the Division of Biological Sciences, pages 221–223.

Microbiology

Microbiology is a specialization based in the College of Agriculture and Life Sciences. The program provides training for technical positions in microbiology or preparation for graduate work in theoretical and applied microbiology. Students may prepare for career options such as food microbiology or pharmaceutical and industrial microbiology, or pursue preprofessional veterinary, medical, and dental programs. For a limited number of students who are selected for the clinical microbiology specialization, the senior year may be spent at Cornell Medical College and the New York Hospital or at another affiliate.

The course of study requires concurrent course work in chemistry, physics, and mathematics and is designed to fulfill the requirements for accreditation by the American Academy of Microbiology. Most students specializing in microbiology elect additional course work in the College of Veterinary Medicine. More information may be obtained from the Department of Microbiology, Stocking Hall.

Nutritional Sciences

The Division of Nutritional Sciences is an intercollege unit affiliated with the College of Human Ecology and the College of Agriculture and Life Sciences. Most students are admitted to the undergraduate nutrition major through the College of Human Ecology. Students in the College of Agriculture and Life Sciences who want to pursue a nutrition emphasis may plan a concentration in Biological Sciences, Option B, or in General Studies in Agriculture. Other studies in CASL closely related to nutritional sciences include food science, food-industry management, animal sciences and nutrition, vegetable crops, and microbiology. For more information about the curriculum, see Division of Nutritional Sciences, page 334, or consult M. Devine, associate director for academic affairs in the division.

Environmental Studies

The study of the environment and man's interaction with it is a vigorous and challenging area. The strategy for developing reasonable solutions to environmental problems requires a strong base of scientific, ecological, and technical knowledge: the ability to understand the natural environment; and the ability to estimate the effect of man's interaction with the environment. New tools and techniques borrowed from all areas of science and technology are being applied to the solution of environmental problems. Areas of specialization in environmental studies are the agronomic sciences relating to the atmosphere and to soils, entomology, landscape architecture, and natural resources with emphasis in wildlife, forestry, and aquatic science. The specializations are based in the departments of Agronomy, in Emerson Hall, Entomology, in Comstock Hall, Floriculture and Ornamental Horticulture, in the Plant Sciences Building, and Natural Resources, in Fernow Hall.

Agronomic Sciences

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

Crop science is the application of basic biological and ecological concepts to the production and management of field crops. Examples of field crops are alfalfa, corn, soybeans, and wheat. Courses required 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 degree should take additional courses in crops, soils, crop physiology, economics, communication, plant pathology, entomology, nutrition, genetics, microbiology, and climatology. Students planning a 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 agricultural meteorology, forecasting, and physical meteorology. The core curriculum satisfies the basic educational requirements for employment as a professional meteorologist and provides a sound background for graduate study or work in the numerous specialized areas of meteorological science. Students are encouraged to choose additional course work in related or complementary areas of interest such as agriculture, biology, computer science, mathematics, statistics, physics, chemistry, or engineering.

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

Entomology

Entomology offers students an opportunity to adapt their area of specialization to any of a variety of interests. Many students in entomology anticipate graduate training in their field; others may elect to enter other professional careers. Some students elect to continue their studies beyond the bachelor's degree in this area. The major requirements are designed to provide a substantial background in this field of study. Area courses in entomology are offered in the following general areas: insect biology, insect morphology, and introductory insect taxonomy. These courses are followed by two or more courses from different areas of emphasis within entomology. At the same time, students are required to build a strong background in the basic sciences.

Landscape, Horticulture and Ornamental Horticulture

Landscape architecture, affiliated with the College of Agriculture and Ornamental Horticulture, is cosponsored 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 curriculum. 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 by the State Board for Landscape Architecture of the New York State Education Department.

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. Because of the six-semester design studio requirement, they enter the program at the second-year level. A maximum of 30 credits can be accepted for transfer.

Core courses in conceptual 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 and aesthetically pleasing. An option for study abroad in Denmark is incorporated into the spring semester of the junior year.

Requirements for specialization in landscape architecture include satisfactory completion of the 69-credit core curriculum and an approved summer internship.

Curriculum

First Year—Fall Term

First Year—Spring Term

Second Year—Fall Term

Second Year—Spring Term

Third Year—Fall Term

Fourth Year—Fall Term

Major Fields of Study
Master of Landscape Architecture (M.L.A.) degree: first professional degree curriculum. The three-year M.L.A. curriculum is organized to prepare a student for professional practice in landscape architecture and is structured to provide a first professional degree for students with bachelor's degrees 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 thesis or final project.

Curriculum

First Year—Fall Term

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA 501</td>
<td>Design Fundamentals</td>
<td>6</td>
</tr>
<tr>
<td>LA 500</td>
<td>Graduate Orientation Seminar</td>
<td>1</td>
</tr>
<tr>
<td>LA 205</td>
<td>Graphic Communication I</td>
<td>3</td>
</tr>
<tr>
<td>LA 220</td>
<td>Principles of Spatial Design</td>
<td>3</td>
</tr>
<tr>
<td>LA 520</td>
<td>Contemporary Issues in Landscape Architecture</td>
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</table>

Second Year—Spring Term

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>LA 502</td>
<td>Site Planning</td>
<td>6</td>
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<tr>
<td>LA 206</td>
<td>Graphic Communication II</td>
<td>3</td>
</tr>
<tr>
<td>LA 310</td>
<td>Site Construction I</td>
<td>4</td>
</tr>
<tr>
<td>LA 224</td>
<td>Plants and Design</td>
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First Year—Spring Term

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>LA 521</td>
<td>History of Landscape Architecture I</td>
<td>3</td>
</tr>
<tr>
<td>LA 521</td>
<td>History of Landscape Architecture II</td>
<td>3</td>
</tr>
<tr>
<td>LA 313</td>
<td>Woody Plant Materials for Landscape Use</td>
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Fourth Year—Fall Term

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>LA 607</td>
<td>Studio: Professional Practice</td>
<td>3</td>
</tr>
<tr>
<td>LA 608</td>
<td>Studio: Advanced Site Design</td>
<td>3</td>
</tr>
<tr>
<td>LA 621</td>
<td>Summer Internship Seminar</td>
<td>2</td>
</tr>
<tr>
<td>LA 531</td>
<td>Regional Landscape Planning I</td>
<td>3</td>
</tr>
<tr>
<td>LA 613</td>
<td>Image Analysis I: Landforms</td>
<td>3</td>
</tr>
</tbody>
</table>

Fourth Year—Spring Term

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA 606</td>
<td>Studio: Interdisciplinary Site Planning</td>
<td>6</td>
</tr>
<tr>
<td>LA 522</td>
<td>History of Landscape Architecture III</td>
<td>3</td>
</tr>
<tr>
<td>LA 634</td>
<td>Landscape Architectural Research</td>
<td>3</td>
</tr>
<tr>
<td>LA 300</td>
<td>Earth Resources Inventories</td>
<td>3</td>
</tr>
</tbody>
</table>

Summary of credit requirements:

- Specialization requirements: 76 credits
- Free electives (minimum): 15 credits
- Total: 91 credits

Master of Landscape architecture (M.L.A.) degree: second professional degree curriculum. The two-year Master of Landscape Architecture (M.L.A.) curriculum 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 institution.

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 may 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 members of their graduate committee. This must include at least two advanced studios, a graduate seminar, and a thesis or final master's project.

Natural Resources

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

The program is based in the Department of Natural Resources and is housed in Fernow Hall. The Amos Forest Research Center, a biological field station laboratory within driving distance of the campus, has facilities for field-oriented courses and workshops and opportunity for in-residence study at the Amos Camp.

The curriculum helps prepare students for many useful endeavors and can serve as a base for graduate work in many fields. Students are prepared to appreciate and understand their natural environment and man's impact on it. A foundation is developed for the many students who continue with graduate professional training in natural resource conservation, wildlife science, fishery and aquatic sciences, and related resource programs.

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

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

For students who wish to specialize further, natural resources offers a variety of options—wildlife science, forest science, aquatic science, and fishery science.

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

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 science students. Thus has an opportunity to become well prepared for a career in food science. The flexibility of the food science program allows students to prepare for a variety of positions in industry, government, or education. Some of the positions and areas of work require graduate training, and it can be useful in others as well. Opportunities for graduate study exist at a number of universities, e.g., Cornell.

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

During the first two years, students take courses in biology, chemistry, physics, microbiology, and introductory food science, as well as making progress in meeting general college requirements. 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.

Students are required to take Introductory Food Science, Introductory Nutrition, Food Analysis, Nutritional Aspects of Food Processing, Food Engineering, Sanitation and Public Health, Food Processing I and II, Food Chemistry, Sensory and Objective Evaluations of Foods, Food Microbiology, food chemistry laboratories, and introductory statistics.

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.

Plant Science

Plant science students may majorize in general plant science, plant breeding, plant pathology, plant protection, field crops, floriculture and horticulture, pomology, and vegetable crops. Students with well-defined interests may specialize when they enter college. Others can start in the general plant sciences curriculum and, if they desire, specialize after the second year.

Study in the plant sciences is offered jointly by the Department of Agronomy, in Emerson Hall, and the departments of Floriculture and Ornamental Horticulture, Plant Breeding, Plant Pathology, Pomology, and Vegetable Crops, all located in the Plant Science Building.

Agronomy

Crop science. Courses required for all students specializing in crops include general biology, botany, plant physiology, general chemistry, mathematics, 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, communications, plant pathology, entomology, nutrition, genetics, microbiology, and climatology.

Planning graduate or professional study beyond the bachelor's degree should take advanced work in biochemistry, botany, quantitative and qualitative, and organic chemistry; calculus; physics; and statistics.

Botany

See the botany concentration of the Division of Biological Sciences, p. 222.

Floriculture and Ornamental Horticulture

The field of floriculture and ornamental horticulture applies principles of plant science and business management to the production and marketing of floriculture, nursery, and turfgrass crops as well as to the selection and management of plants for both indoor and outdoor landscapes. Programs prepare students for careers in the professional and managerial levels in horticulture, as interior and landscape designers, communications, and extension education.

To obtain the Bachelor of Science degree with specialization in floriculture and/or landscape horticulture, a student must complete the core curriculum consisting of the following courses:

Flor 100, Introduction to Floricuture and Ornamental Horticulture
Flor 213, Woody Plant Materials
Flor 312, Garden and Interior Plants II
Flor 401, Principles of Plant Propagation
Bio S 241, Plant Biology (Introductory Botany)
Bio S 242, Plant Biology (laboratory)
Bio S 244, Plant Physiology (laboratory)
Agron 200, Nature and Properties of Soils
Entom 241, Applied Entomology, or Entom 212, Insect Biology
Pl 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, justifiable exceptions to these requirements may be granted by the student's adviser.

With permission of their adviser, transfer students may receive core curriculum credit for similar courses taken at other institutions provided that transfer credit is granted by the college. In addition, all transfer students must complete a minimum of 12 credits in floriculture and ornamental horticulture courses at Cornell. No more than two of the following landscape architecture courses may be included in this 12-credit requirement: LA 220, LA 224, LA 340, and LA 311. Freehand drawing courses may not be applied to this requirement.

Students are also asked to select an area of emphasis in either floriculture or landscape horticulture by the beginning of their junior year. Specialization in floriculture prepares a student for a career in greenhouse florist-crop production management and wholesale and retail florist marketing, whereas specialization in landscape horticulture 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 arboriculture management, urban horticulture, and related areas. Some students choose to pursue a general program in floriculture and landscape horticulture, including courses in all these areas. Similarly, programs in horticultural business management, research, teaching, extension education, and communications may be arranged across the two specialization areas. Students wishing to prepare for graduate study in floriculture may develop a program in basic sciences and their application in horticultural science. Lists of recommended courses for the areas of specialization are available from student advisors.

The department offers each student, working with his or her faculty adviser, an opportunity to tailor a program to achieve individual educational objectives in floriculture and landscape horticulture. Students are also encouraged to take courses in these areas: agricultural economics and business management, agricultural engineering, agronomy (soils), computer science, ecology, entomology, plant pathology, plant physiology, oral and written expression, and plant taxonomy. Use of electives to pursue study in the humanities and in other areas of special interest to the student is encouraged and provides opportunities for broadening and enriching learning experiences. Numerous opportunities to become familiar with the horticultural industries and professions are provided through field trips, guest lecturers, and optional special topics and work experience programs.

Incoming freshmen are advised during their first year by the department's faculty freshman adviser and afterwards by a faculty adviser whose expertise is similar to the career interests of the students. A considerable number of the undergraduate students in the department transfer to Cornell after completing two years of study at another college. These students are assigned immediately to a faculty adviser according to their career interests.

Questions concerning the undergraduate curriculum, advising, and related matters should be addressed to Dr. Kenneth W. Mudge, Undergraduate Curriculum Coordinator, Department of Floriculture and Ornamental Horticulture, 13 Plant Science Building, Ithaca, New York 14853 (telephone: 607/255-4586).

The department's main office is in 20 Plant Science Building. Other departmental facilities include classrooms and laboratories in the Plant Science Building, greenhouse, and nursery areas at the Kenneth Post Laboratory, the Test Garden, the Turfgrass Field Research Laboratory, landscape architecture studios in Plant Science Hall, and freehand drawing studios in Mann Library.

While the Landscape Architecture Program is a component of the Department of Floriculture and Ornamental Horticulture, it is described separately on pages 33-34.

Plant Sciences, General

General plant science is intended for students whose interest in studying plants has not yet centered on any one of the more specialized groups within the area. Students may continue with this option throughout their undergraduate years, particularly if they are likely to be interested in and qualified for advanced studies beyond the bachelor's degree. Students who plan to seek employment after graduation may prefer to specialize. There are, however, opportunities for general plant science graduates in the service and supply industries, as extension agents, as teachers, and as research technicians.

More than a hundred courses are offered that deal directly with some area of plant science. Other courses relating to plant science are offered in agricultural meteorology, food science, and soil science. In addition, an interest in plant science can be combined with agricultural engineering, conservation, education, extension, marketing, statistics, international agriculture, or some other area of specialization.

Undergraduates are encouraged to obtain practical experience. This may involve research under the direction of a faculty member or work in a commercial industry or research institute or on a farm. The Department of Plant Pathology will assist students looking for positions that would provide useful experience.

Plant Breeding

Plant breeding provides undergraduates with (1) preparation for graduate study leading to advanced degrees in plant breeding, and (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 for students to choose from include plant breeding and plant genetics, genetics, cytology, and cyrogenetics; mathematics (calculus) and statistics; organic chemistry and biochemistry; plant anatomy, ecology, and physiology, crop production, and plant pathology and disease control.

Plant Pathology

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

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

Plant Protection

This specialization 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 agrimarketing, the agrochemical industry, cooperative extension, or pest management consulting, state and federal regulatory work, and a variety of other technical positions. Although designed as a terminal program for students desiring a practical preparation in plant protection, this specialization may also provide an adequate background for graduate work in entomology, plant pathology or weed science.

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

In addition, a number of other subjects pertinent to plant protection are recommended, depending upon the student's interests: agricultural economics, agricultural engineering, agronomy, biochemistry, communication arts, pathology and entomology, general physics, genetics, meteorology, mycology, pesticides in the environment, and plant anatomy. Employment involving practical experience in plant protection, between the junior and senior years, on a farm, at an experiment station, with an agricultural company, or with a regulatory agency is encouraged.

**Pomology**

Pomology provides students a choice of two options: pomology or fruit production. While the two programs are quite similar, they are designed to meet the needs and interests of students preparing for two different lines of work. The pomology option is intended to provide students with somewhat more training in basic sciences in preparation for professional service with agencies concerned with fruit production and further study at the graduate level. The fruit production option is intended to meet the needs of students planning to operate or manage fruit farms or to engage in similar work.

**Recommended Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Option</th>
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<tbody>
<tr>
<td>Pomology</td>
<td>20</td>
<td>Option</td>
</tr>
<tr>
<td>Biological sciences</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Entomology</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Plant pathology</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Agricultural economics</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Agricultural engineering</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Plant breeding</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry, physics, and mathematics, in addition to distribution requirements</td>
<td>20</td>
<td></td>
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</tbody>
</table>

**Vegetable Crops**

Vegetable crops is one of the most diverse applied and theoretical areas in agriculture. In New York, more than twenty economically important vegetables are produced and marketed. Vegetable crops have a high value per acre, making it economically feasible to invest 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, extending, and banking. Some students may continue their studies in graduate school in preparation for teaching, research, or cooperative extension work in colleges and universities or in private industry. Recently there has been an increased interest in growing vegetables in tropical countries, and international agriculture, with a specialization in vegetable crops, provides excellent training for this vocation.

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

**Special Programs and Career Options**

Some students are interested in pursuing a broad general education in agriculture and the life sciences. Others are interested in pursuing a specialized interest, while still others are uncertain about their career objectives. Such students, in cooperation with their faculty advisers, plan a general sequence subject to their individual interests, abilities, and objectives. Independent study in areas outside of existing program areas must be planned with a faculty adviser. Information on these options is available in the Office of Student Affairs, 17 Roberts Hall.

**Cooperative Extension**

Students may prepare for cooperative extension careers in agricultural production, 4-H youth development, community development, and homes and grounds education. 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 program:

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 to complete the requirements for a specialization.

**Specialization**

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Adviser</th>
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</thead>
<tbody>
<tr>
<td>Animal science and dairy production</td>
<td>R. Warner</td>
</tr>
<tr>
<td>Farm business management and finance</td>
<td>G. Casler</td>
</tr>
<tr>
<td>Field crops and soil science</td>
<td>D. Lathwell</td>
</tr>
<tr>
<td>Floriculture and ornamental horticulture</td>
<td>G. Good</td>
</tr>
<tr>
<td>Pomology</td>
<td>G. Oberly</td>
</tr>
<tr>
<td>Vegetable crops</td>
<td>W. Kelley</td>
</tr>
</tbody>
</table>

Students who want to prepare for careers in 4-H programs or cooperative extension in 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. Schauer |
| All other areas         | G. Broadwell |

**General Studies in Agriculture**

This specialization allows students to design courses of study suited to their individual interests, abilities, and objectives (1) for general education in agriculture or in one of the many closely related fields of agriculture; (2) for temporary classification to help them define vocational interests and goals, or (3) for independent study in a specialized field not encompassed by the existing program areas. For example, undergraduates in CALS may develop a nutritional sciences concentration through courses that focus on the role of agriculture in human nutrition. However, most undergraduates who major in human nutrition are admitted through the College of Human Ecology. See page 334.

The general agriculture option includes production as well as technical courses in agriculture. Students, with help from their faculty adviser, select a broad range of agricultural electives to provide a broad background of agricultural experience. The minimum course and distribution requirements for general agriculture are those required of all students in the college. Advanced courses in the basic agricultural and life sciences are included. Students should contact the Office of Student Affairs for a list of advisers.

**International Agriculture**

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 in countries 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 of 45 credits, 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. Over (telephone: 256-2283).

**Statistics and Biometry**

Statistics is concerned with qualitative 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, 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 310; Mathematics 191 or 111, 122 or 112, 192, and 221–222 or 214–215–216; 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 314; 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 662; 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).

Teacher Preparation

For information about teacher preparation and certification to teach agricultural subjects students should contact Professor W. Drake, Department of Education, 204 Stone Hall (telephone: 256-2197).

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 coincide 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 005 Basic Review Mathematics Fall or spring. 3 credits (this credit is not counted toward the 20 credits required for the degree). Primarily for entering students.
Fall: M W F 8 (two sections) or 12:20 (two sections). Spring: M W F 12:20 (two sections). H. A. Geiselmann and staff.

Exposes students to some of the concepts necessary for success in other mathematics and science courses. Topics include exponents and radicals, conversion of units, algebraic fractions and factoring, solving equations in one or more unknowns, ratio, proportion and variation, percent and mixture problems. Concepts are placed on the analysis and reasoning involved in the solution of verbal problems requiring the use of mathematics.

ALS 027 Introduction to Farm Techniques Fall or spring. No credit. Grade does not appear on transcript. For permission to register, contact the Office of Career Development, 16 Roberts Hall.

Provides supervised instruction in the basic manual skills of farming, including milking by hand and machine, handling livestock, and operating tractors and field equipment. General orientation to the practices and procedures of day-to-day farm operation.

ALS 115 Introductory College Mathematics Fall or spring. 4 credits. M W F 9:00 (two sections), or 12:20 (two sections). Lab, T 11:15 or 12:20, or R 11:15 or 12:20. Evening exams. H. A. Geiselmann, S. C. Plieler.

Designed to give students with sound high school mathematics backgrounds a unified treatment of the basic concepts of college algebra, analytic geometry, and the elements of calculus. Considerable emphasis is placed on the concept of function, graphical problem solving, and staff. The Cornell University Computing Language (PL/C) is taught and used to strengthen and integrate the mathematical topics covered.

ALS 400 Internship Fall, spring, or summer. 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 Session Assistant's Program, and the Albany Semester Program. A learning contract is negotiated between the student and the faculty supervisor, stating conditions of internship, 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. Feidman, J. C. Mbatu, R. J. McNeil, and others.

The theme of world community is examined 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.

ALS 469 Agriculture, Society, and the Environment (also Biological Sciences 469) Spring, 3 credits.
Lecs. T 12:20; disc W evenings and by arrangement. D. Pimentel and others.

This course, designed and conducted by Cornell students and staff, stresses a broadening of the scope of agriculture. The course stresses the importance of a holistic approach to agriculture by offering perspectives on many factors related to food production, soil fertility, plant breeding, pest control, ecosystems, world food problems, livestock production, energy, economics, social and political concerns, labor problems, and land and water management. This approach is used to develop the basic framework on which future options and strategies for food production in the United States and the world are examined and evaluated.

ALS 661 Environmental Biology (also Biological Sciences 661) Fall or spring. 1–3 credits.
Prerequisite: permission of instructor. Hours to be arranged. D. Pimentel.


150 Economics of Agricultural Geography Fall 3 credits.

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

220 Introduction to Business Management Fall 3 credits.

Discs are held instead of a lecture in all but four weeks of the term. R. D. Apin.

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

221 Accounting Spring. 3 credits. Not open to freshmen.

A comprehensive introduction to financial accounting concepts and techniques, intended to provide a basic understanding of the accounting cycle and elements of financial statement analysis and interpretation. Concepts rather than procedures are emphasized.

240 Marketing Spring. 3 credits.

An introductory study of the firm's 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.
An introduction to cost accounting that emphasizes 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, and accounting for inflation.

324 Financial Management Spring 3 credits. Prerequisites: Agricultural Economics 220 or equivalent. Recommended: Agricultural Economics 221 and 310 or equivalents.

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, and budgeting, acquisition, organization, and management of capital, labor, land, and machinery.

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

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

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


332 Economics of the Public Sector Fall 3 credits. Prerequisite: Economics 102 or equivalent.

Lees, M W F 11:15; disc to be arranged.


342 Marketing Management Fall 3 credits. Prerequisite: Agricultural Economics 240 and Economics 101–102.

Lecs, M W F 10:10; disc, R 12:20–2:15 or 12:40–2:45; F 8:30–9:30, 10:10–12:05, or 12:20–2:15.

In weeks when disc are held, there will be no F lecture. D. C. Goodrich.

346 Dairy Marketing Spring 2 credits. Limited to juniors and seniors. Prerequisite: Economics 101.

J. B. Bugliari, D. A. Grossman.

The lecture portion is the same as Agricultural Economics 320. Discussions deal with practical applications of the legal principles covered in that course and attempt also to give some deeper insight into the roles and functions of the lawyer and the judiciary in our society.

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

The impact of taxation, both state and federal, on economic decisions. Emphasis is on personal property, contracts, agency, real property, and partnerships and corporations.

21 Business Law Fall 4 credits. Limited to upperclass students. Prerequisite: permission of instructor.

Lecs, M W F 9:05, disc, M 4, one evening. J. B. Bugliari, D. A. Grossman.

Consideration is given chiefly to legal problems of particular interest to persons who expect to engage in business. Emphasis is on personal property, contracts, agency, real property, and partnerships and corporations.

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409 Farm Management Workshop Fall. 1 credit. Limited to seniors and graduate students. T 12:20-2:35. B. F. Stanton and staff. Presentation and interpretation of research in farm management and production economics. Each participant conducts a seminar and prepares a publishable evaluation of research results directed toward farmers and extension and business leaders.

410 Seminar In Farm Business Organization and Estate Planning Fall (first meeting), last Monday in September. 1 credit. Prerequisite: Agricultural Economics 302 and 405. M 1:25–3:20. R. S. Smith. Designed for seniors who plan to return to the home farm or 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. Class presentations are informal. Students solve case problems and prepare papers on their home farm or an assigned problem.

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

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

416 Price Analysis Spring. 2 credits. Prerequisite: Agricultural Economics 310 or equivalent and coregistration in Agricultural Economics 415. Lecs; M W 12:20. W. G. Tomok. The course introduces students to procedures used in empirical studies of demand, supply, and price behavior for agricultural products. Multiple regression techniques are emphasized. Each student is required to specify, fit, and report on an empirical model.

420 Advanced Business Law Spring. 3 credits. Limited to upperclass students. Lecs; T R 9:05–10:55. One evening prelim. J. B. Bugliari. Designed to provide a fairly detailed and empirical model. Designed to provide a fairly detailed and empirical model.

422 Estate Planning Spring. 1 credit. Limited to upperclass students. S-U grades only. Cannot be taken by students who are enrolled in or who have taken Agricultural Economics 421. Lecs; T 4. J. B. Bugliari. Fourteen sessions on the various aspects of estate-planning techniques. The law and use of trusts, the law and use of joint estate and gift taxes, and probate procedures are covered.

424 Business Policy Spring. 3 credits. Limited to seniors majoring in business management and marketing. T 9:05–10:35, 11:05–12:35, or 2:30–4:00. R. F. Staton. 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 top management level. The course is built around a series of cases. Emphasizes improving oral and written communication skills.

425 Personal Financial Management Spring. 2 credits. Limited to juniors and seniors. Lecs; M 12:20–2:15; disc to be arranged. Second hour of rec is omitted in weeks discussions are held. D. A. Grossman. Managing personal finance to maximize financial goals and objectives. Topics include financial institutions, 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.

462 Management of Cooperative Action Fall. 3 credits. Recommended: Agricultural Economics 220 or equivalent. Lecs; M W F 11:15. Evening prelim. B. L. Anderson. Investigates the unique aspects of cooperative business organizations. Topics are approached from the point of view of management, the board of directors and members, and include cooperative principles, management decision making, legislation, financing, taxation, and marketing problems. Cooperatives attempt to handle. Primary focus is on operating cooperatives in agriculture, but an examination of informal group action, bargaining cooperatives, marketing boards, 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 352 or Economics 311. Lecs; T R 11:15; sec, M or W 3:35. Evening prelim. A. Buckwell. An examination of the rationale and method of commodity trade policy. The course analyzes programs and issues in both developed and less-developed countries and deals with major questions associated with the organization of international commodity markets.

443 Food Industry Management Spring. 4 credits. Limited to juniors and seniors. Prerequisites: Agricultural Economics 240. Lecs; T R 8:40–9:55; J. Brake, L. Tauer, E. LaDue. Advanced topics in capital management and financing of agriculture. Special emphasis on current issues. Example topics: farm-sector funds flows, financial risk and decision analysis, agricultural finance policy, financial intermediation, farm and food industry situations. The various elements of marketing are examined, including buying, pricing, advertising, promotion, display, store layout, profit planning and control, and merchandising strategy.

449 Field Study of Marketing Institutions Fall 2 credits. Prerequisites: Agricultural Economics 342, previous enrollment or concurrent registration or permission of instructor. Field trips will cost approximately $185. 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. 15–16, 1984). Grades are not registered until February, B. L. Anderson, E. W. McLaughlin. The course gives students firsthand exposure to examples of marketing institutions and marketing management through field trips, guest lectures, case studies, and class discussions. Emphasis is on the applied aspects of marketing, marketing functions, and marketing strategies.

450 Evaluating Resource Investment and Environmental Quality 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. T 10:10–11:30; disc to be arranged. D. J. Allee. Means of reaching decisions on environmental questions. Concepts of social value and cost-benefit analysis, determination of degrees of importance of environmental problems, environmental/impact statements, definitions of environmental quality, and questions of political economy.

452 Land and Mineral Economics Spring. 3 credits. Prerequisite: Economics 311. Lecs; T 9:05–10:30; sec, R 2:30–4:25. R. J. Kalter. The application of economic principles to the analysis of private and public sector resource management/use issues. Land and mineral markets, the role of land in production, mineral valuation, taxation, financing, and land use, legislative factors, use planning and restrictions, and public land management will be stressed.

464 Economics of Agricultural Development Spring. 4 credits. Prerequisite: Agricultural Economics 150, Economics 101–102, or permission of instructor. R 9:05 and T or W 1:25. D. K. Freebairn. An examination of the processes of agricultural development in Third World nations and their interactions with United States policy. Agricultural and rural development policy influences the development of agriculture with other sectors, alternative forms of agricultural organization, and policies tending to alleviate highly concentrated income distributions are all emphasized.

499 Undergraduate Research Fall or spring 1–4 credits. Limited to seniors with grade point averages of at least 2.7. Prerequisite: written permission of the staff member who will supervise the work and assign the grade; this permission must be attached to course enrollment material. S-U grades optional. Prerequisites: 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, 405, or equivalent. Offered alternate years. Not offered 1983–84. T R 8:40–9:55. J. Brake, L. Tauer, E. LaDue. Advanced topics in capital management and financing of agriculture. Special emphasis on current issues. Example topics: farm-sector funds flows, financial risk and decision analysis, agricultural finance policy, financial intermediation.
40 Agriculture and Life Sciences

and intermediaries, firm growth, inflation, investment-replacement models, and selected topics on financing agriculture in developing countries.]  

608 Production Economics Fall. 3 credits. Prerequisite: Economics 311 or equivalent. Recommended: Mathematics 108 or 111 or equivalent. 

Lecs, M W F 10:10. L. W. Tauer. The theory of production economics with emphasis on applications to agriculture. Topics include the production function, estimation, and use of production, cost, profit, demand, and supply functions. Production response over time and under risk is introduced.

640 Analysis of Agricultural Markets Fall. weeks 1–7. 2 credits. Prerequisites: Agricultural Economics 415 and 416 or equivalents. 

Lecs, T R 12:20–2:15. L. L. Hall. This course provides an introduction to agricultural market analysis. Topics include distinguishing characteristics of agricultural markets, equity and efficiency concepts for evaluating market performance, and discussion of the structure of food demand, pricing, and distribution in United States and foreign markets. Presentations and discussions will focus on applications to current problems and issues.

641 Time in Agricultural Markets Fall. weeks 8–14. 2 credits. Prerequisites: Agricultural Economics 415 and 416 or equivalents. Recommended: Agricultural Economics 640. 

Lecs, T R 12:20–2:15. G. W. Tomek. Topics include the economic functions of markets for forward contracts, price behavior and relationships on cash and futures markets, hedging and speculation, and measuring performance. Research results are used to elucidate principles underlying hedging and public policy decisions, but this is not a course on managing positions in futures.

643 Export Marketing Fall. 3 credits. Prerequisite: permission of instructor. Estimated cost of field trip, $100. 

Lec, R 2:30–4:45. Overnight field trip to New York City required. W Lessuer. The history and development of commercial United States exports of agricultural commodities and the mechanics and procedures of exporting. Alternatives in sales contracts, shipping, insurance, financing, business structure, researching markets, and promotion. Trading experiences of specific commodity specialists.

650 Economic Analysis of Public Policy Spring. 4 credits. Primarily for graduate students but open to seniors. 

T R 9:05–11. R. J. Kaller. The application of economic theory and analysis to governmental decision making, budgeting, and expenditure processes, with emphasis on the welfare criteria of economic efficiency and income distribution. Techniques of benefit-cost, equity, and environmental analysis will be stressed. Discount rates, benefit estimation, externalities, multipliers, uncertainty, and social welfare functions will be covered.

651 Economics of Resource Use Fall. 4 credits. 


661 Food, Population, and Employment II Spring. 1–3 credits. Prerequisite: permission of instructor. 

Individual weekly meeting with the instructor. T T. Poelam. Issues such as role of agriculture in economic development, household farm as producing and consuming unit, operation of product and factor markets in agricultural and rural areas, structural transformation of agriculture in the process of economic development, theories of agricultural development, 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 608, or permission of instructor. 

T 2:30–4:25. D. 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 policy implementation. Particular attention is paid to the interactions of agrarian structure, agricultural productivity, and rural welfare.

666 Seminar in Agricultural Development Fall or spring. 1–3 credits. The seminar is normally taught when a visiting professor is available who has had recent direct experience in low-income countries. Hours to be arranged. 

An analysis of current problems for the development of the agricultural sector of low-income countries, with emphasis on the implications of such problems to the definition of research.

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 offerings. More than one topic may be given each semester in different sections. The student must register in the section appropriate to the topic being covered; the section number is provided by the instructor.

708 Advanced Production Economics Fall. 3 credits. Prerequisites: Agricultural Economics 608, 710, or equivalents. Offered alternate years. 

Hours to be arranged. T. N. Boisvert. Theoretical and mathematical developments in production economics, with emphasis on estimating microproduction and macroproduction relationships, the scale economies, factor substitution, and recently developed functional forms. Discussions of several other selected topics such as risk, supply response, and household production function change from year to year based on student interest.

710 Econometrics I Spring. 4 credits. Not open to undergraduates. Prerequisites: Statistics 416 and 601 or equivalent. 

Lecs, T R 2:30–4:25. G. W. Tomek. This course covers basic topics in econometrics at an intermediate level, reviewing the least squares estimator, continuing with topics such as specification error and autocorrelated residuals, and concluding with simultaneous equations estimators. The content is designed for Ph.D. students who will be doing empirical research as applied economists.

711 Econometrics II Fall. 4 credits. Prerequisite: Agricultural Economics 710 or equivalent. Statistics 416 recommended. 

Lecs, T R 10:10–12:05. T. D. Mount. Coverage beyond that of Agricultural Economics 710 of generalized least squares, testing linear hypotheses, the effects of specification errors, and regression diagnostics. Applications include seemingly unrelated regressions, estimation with pooled data, models with stochastic coefficients, models with limited dependent variables, and distributed lag models.

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

Recommended: statistics 417. 

Lecs, M W F 11:15. R. N. Boisvert. A comprehensive treatment of linear programming and its extensions, including postoptimality analysis, goal programming, and the transportation model. Special topics in nonlinear programming, including separable, spatial equilibrium and risk programming models. Input-output models are treated in detail. Applications are made to agriculture, resource, and regional economic problems.

713 Quantitative Methods II Spring. 4 credits. Prerequisite: Agricultural Economics 712 or Economics 517 or permission of instructor. 

Lecs, M W F 9:05–9:55; disc; F 12:20–2:15. J. M. Conrad, R. A. Milligan. A study of quantitative techniques 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 1983–84. 

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.]
740 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.
T R 12:20–2:15. W. H. Lesser. Develops the concepts and methodology for applying and analyzing the effects of public-policy directives on the improvement of performance in the United States food marketing system. Topics include a survey of industrial organization principles, antitrust and other legal controls, coordination systems in agriculture, and cooperative theory and performance. An application of these techniques to analyzing marketing problems in developing economies is also presented.

741 Seminar on Methods of Trade and Commodity Policy Analysis
Spring, weeks 8–14. 2 credits. Limited to graduate students. Prerequisite: basic training in quantitative methods (Agricultural Economics 710 and 712 or equivalent) and permission of instructor. Recommended: Agricultural Economics 640.
F 1:25–4. D. Blandford. A discussion of the structure, use, and usefulness of alternative quantitative methods of commodity policy analysis. Preparing a term paper is an important part of the course.

750 Economics of Renewable Resources
Spring 4 credits. Prerequisites: Economics 509 and Economics 513, or Agricultural Economics 713.
T R 2:30–4:25. J. M. Conrad. This course focuses on recent developments in mathematical bioeconomics as they relate 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.

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, J. G. Levine. 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.

Agricultural Engineering


110 Farm Metal Work
Fall or spring. 2 credits. Lec, T R 9:05; lab, M or T 1:25–4:25; spring labs, M or T 1:25–4:25. Staff.
M lab. limited to 24 students, includes instruction in the fundamentals of metal lathe work and arc and oxyacetylene welding. T and R labs, each limited to 20 students, include instruction in sheet metal work, pipe fitting, hot and cold metal work, and arc and oxyacetylene welding.

132 Farm Carpentry
Fall. 2 credits. Each lab limited to 15 students.
Lec, T 9:05; labs, W or R 1:25–4:25. H. A. Longhouse. Instruction in the fundamentals of farm carpentry, including concrete work, and equipment and buildings constructed of wood. Each student is required to plan and construct an approved carpentry project.

151 Introduction to Agricultural Engineering and Computing
Fall. 2 credits. Prerequisite: one term of calculus or concurrent registration in a calculus course.
-Lec, T 1:25; lab, F 1:25–3:20. J. R. Cooke. An introduction to digital computing using the PL/C language through the use of computing problems in agricultural engineering subjects and related areas such as environmental technology and agriculture.

152 Computing with Graphics
Spring 2 credits. Prerequisite: Agricultural Engineering 151.

153 Engineering Drawing
Fall. 2 credits. Limited to 72 students.
Lecs, M 9:05; lab, M or T 1:25–4:25. H. A. Longhouse. Designed to promote an understanding of the engineer’s universal graphic language. The lectures and laboratories develop working knowledge of drafting conventions, drafting techniques, and their application to machine and pictorial drawing problems. Introduction to descriptive geometry and use of interactive computer graphics is included.

200 Undergraduate Seminar
Spring. 1 credit.
Lec, M 2:30. N. R. Scott. 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
Spring. 3 credits. Prerequisite: high school or college physics. S-U grades optional.
Lec, M W F 10:10. Evening prelms. L. D. Albright. Basic concepts of energy and traditional and alternate sources of energy. The energy transfer process is investigated. Topics include heating, cooling, solar radiation, electricity, hydropower, refrigeration, wind power, geothermal energy, biogas production, and energy economics.

208 Application of Physical Sciences I
Fall. 3 credits. Prerequisite: a term of calculus and high school physics (or a year of college physics). Lecs, T 8:20–9:55; rec, W 8 or 9:05.
D. C. Ludington. The application of statics, dynamics, mechanics of materials, and fluid mechanics to physical problems in agriculture. Topics include torque, free-body diagrams, friction, energy, stress, bending, shear, fluid flow, and wall pressures. Emphasis is on problem solving.

209 Application of Physical Sciences II
Spring. 3 credits. Prerequisite: Agricultural Engineering 208.
Lecs, T 9:20–10:55, rec, W 8 or 9:05.
D. C. Ludington. 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.
Lec, T R 9:05–10:55. J. K. Campbell. 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.

250 Engineering Applications in Biological Systems
Spring. 3 credits. Prerequisite: coregistration in Mathematics 294. Recommended for the spring offering year.
Lec, M W F 12:20. R. E. Pitt. Case studies of engineering problems in agricultural and biological systems, including animal and crop production, environmental control, energy, and food engineering. Emphasis is on the application of mathematics, physics, the engineering sciences, and biology to energy and mass balances in agricultural systems.

304 Introduction to Computer Uses in Data Analysis
Spring. 4 credits. Prerequisite: one course in college mathematics or statistics or permission of instructor. S-U grades optional.
Lecs, T R 11:15, lab, M T W R or F 12:25–2:15. Prelms: 7:30 p.m. Feb. 23 and April 15. R. B. Furry. An introductory course in computing for those interested in using digital computers to handle data. Topics include description and preparation of data, preparing and processing computer programs, computer and electronic libraries, and related computing facilities. No prior knowledge of computers or computer languages is necessary.

305 Principles of Navigation
Spring. 4 credits.

310 Advanced Farm Metal Work
Spring 1 credit (2-credit option available). Prerequisite: Agricultural Engineering 110 or permission of instructor.
Lab W 1:25–4: Advanced welding and metal construction project.

311 Farm Machinery
Fall. 3 credits. Each lab limited to 16 students. Prerequisite: high school physics or equivalent.
Lec, T R 11:15; rec-lab, M or T W or R 1:25–4:25.
W. W. Gunik. 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 applicator machinery, and study of the functional characteristics of agricultural machines and machine components.
Characteristics of instruments, signal conditioning and interfacing, shielding and grounding, transducers, data acquisition systems, microprocessors, microcomputers, and radiotelemetry are considered.

672 Drainage  Spring. 4 credits. Prerequisite: Agricultural Engineering 471 or permission of instructor. Offered alternate years.

This course analyzes the design and analysis of surface, subsurface, and combined drainage systems, with emphasis on soil physical properties, surface materials, and storm runoff and infiltration.

Analysis and design of surface, subsurface, and combined drainage systems, with emphasis on soil physical properties, surface materials, and storm runoff and infiltration.

685 Biological Engineering Analysis  Fall. 4 credits. Prerequisite: Theoretical and Applied Mechanics 310 or permission of instructor.

This course covers the analysis and design of irrigation systems, as well as the analysis and design of transducers, data acquisition systems, and interfaces.

Analysis and design of surface, subsurface, and combined drainage systems, with emphasis on soil physical properties, surface materials, and storm runoff and infiltration.

701 Special Topics in Agricultural Engineering  Fall or spring. 1–6 credits. Prerequisite: permission of instructor; S-U grades only.

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: Agricultural Engineering 491 and Civil and Environmental Engineering 341. Offered alternate years.

This course covers the application of geotechnical engineering principles to the selection of materials and design of highway and airport pavements. Laboratory work provides hands-on experience.

676 Industrial Waste Management (also Civil and Environmental Engineering 655)  Spring. 3 credits. Prerequisites: Civil and Environmental Engineering 351 and 653 or permission of instructor.

This course covers the treatment and disposal of industrial wastes, primarily wastewater. Regulatory and legal aspects, pretreatment, and disposal processes for conventional and nonconventional pollutants are discussed. Industrial waste survey, case studies of specific industries, opportunities for recycle and reuse, and the impact of regulations on industrial-waste management are addressed.

677 Treatment and Disposal of Agricultural Wastes  Fall. 3 credits. Prerequisite: permission of instructor.

This course covers the treatment and disposal of agricultural wastes, including the application of fundamental models of treatment and control methods to minimize related pollution. Biological, physical, and chemical pollution control methods are applied to animal agriculture, food production, and food-by-product processing wastes. Use of actual systems as examples.

678 Nonpoint Source Models  Spring. 3 credits. Prerequisites: Computer programming and calculus. Recommended: previous course work in hydrology or soil and water engineering.

This course covers the analysis and design of nonpoint agricultural sources of pollution, with an emphasis on the application of mathematical models of treatment and control methods to minimize related pollution. Fundamentals of ecological, physical, and chemical pollution control methods are applied to animal agriculture, food production, and food-by-product processing wastes.

686 Highway Materials and Pavement Design  Spring. 2 credits. Prerequisite: Civil and Environmental Engineering 341. Offered alternate years.

This course covers the application of geotechnical engineering principles to the selection of materials and design of highway and airport pavements. Laboratory work provides hands-on experience.

711 Soil and Water Engineering Seminar  Fall or spring. 1–3 credits. Prerequisite: graduate status or permission of instructor; S-U grades only.

This course presents an introduction to soil and water engineering problems. Students solve practical problems related to topics in irrigation and drainage, erosion control, hydrology, and water quality.

725 Agricultural Waste Management Seminar  Spring. 1 credit. Prerequisite: permission of instructor; S-U grades only.

This course covers the problem-solving strategies and techniques used in the analysis and design of agricultural wastes, with an emphasis on physical, chemical, and biological aspects affecting waste production, treatment, and handling.

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. L. D. Albright.

785 Biological Engineering Seminar  Spring. 1 credit. Prerequisite: graduate status or permission of instructor. S-U grades only.

Disc to be arranged. N. R. Scott, J. R. Cooke.

Agronomy

R. F. Lucey, chairman; M. Alexander, A. A. App.
J. H. Peverly, W. S. Reid, S. J. Rhia, T. W. Scott, R. R.
Seanev, T. L. Setter, V. A. Snyder, L. P. Szepurkus, A.
Van Wambeke, R. J. Wagener, R. M. Welch, M. J.
Wright, R. W. Zobel.

Courses by Subject

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

Agronomy 43


Agricultural Engineering: 666, 667, 668, 669, 670, 771, 774

Environmental Engineering: 471, 481, 482, 487, 508, 608, 663, 666, 667, 668, 670, 771, 774

Agronomy 101 (103) Basic Principles of Meteorology Laboratory  Fall 3 credits. Limited to 140 students.

Lecs, T R 11:15; lab, M T W or R 1:25–4:25.

B. E. Dethier.

Techniques of analysis of weather systems and the application of dynamical and empirical methods of predicting the daily atmospheric circulation.

260 (200) Nature and Properties of Soils Fall or spring 4 credits. Prerequisite: Chemistry 103, 207, or 215.

S-U grades.

A comprehensive introduction to the field of soil science, with emphasis on principles and their application in solutions of practical soil management problems.

311 Grain Crops  Fall. 4 credits. Prerequisite: Agronomy 260 or Biological Sciences 241.

Lecs, M W F 10:10; lab, M T W or R 1:25–4:25. One or two field trips during lab periods (until 5 p.m. or on weekends). R. L. Oldendorf.

Principles of field-crop growth, development and maturation, species recognition, soil and climatic adaptations, timing and mineral nutrition, weed control, cropping sequences, management systems, and crop improvement are considered. Grain, protein, oil, fiber, and sugar crops are emphasized.
312 Forage Crops Spring. 4 credits. Prerequisites: Agronomy 260 or Biological Sciences 241. Recommended: Animal Science 112. Lecs., M W F 11:15; lab, T or W 1:25–4:25. One field trip during an eight-week 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 com 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., W F 10–10: M. 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 F, lab, M W T W 2–4:25. W. B. Duke. Principles of weed science are examined. Emphasis is given to (a) weed ecology, (b) chemistry of herbicides in relation to effects on plant growth, and (c) the development and use of herbicides in crop production. 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 11:15–1:25; lab, R 1:25–4:25; two all-day field trips will be scheduled during the semester. A. G. Taylor, Geneva Experiment Station (this contact, R. L. Oberdorfer). The principles and practices involved in the production, harvesting, processing, storage, testing, quality management, identification, and use of high-quality seed from improved cultivars. Information is applicable to various kinds of agricultural seeds.

334 (314) Agricultural Meteorology Spring. 3 credits. Limited to 35 students. T R 10–11:25. A. B. Pack. An introduction to the relationships of radiant energy, temperature, and 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 factors on plant growth, and the bioclimatic requirements of plants are also discussed.

335–336—337—338 (325—326—327—328) 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 the data products used in weather forecasting.

360 (300) Earth Resources Inventories Spring. 3 credits. Lecs., M W F 12:20; lab, M T 2, E. E. Hardy. Procedures for inventorying resources, the methods used, and theories of inventory development in relation to present needs. Examination of the processes used in generating current used inventories, applications of methods to improve existing inventories, and experience in developing inventories. Land-resource inventories are emphasized.


362 (302) Soil Morphology Fall. 1 credit. Prerequisite: Agronomy 260 or consent 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 landscapes are presented. A series of soil pits are examined, described, classified, and interpreted in the field.


368 (308) Soil Chemistry Laboratory Spring. 2 credits. Prerequisite: Agronomy 260, Chemistry 207–208, and Agronomy 366. Can be taken concurrently with Agronomy 366. R 1:25–4:25. M. McBride. Laboratory exercises are designed to measure soil-chemical properties using wet chemical and spectrophotometric methods. A weekly discussion period will follow each laboratory.

371 (321) Soil and Water Conservation Fall. 3 credits. Prerequisites: Agronomy 260 and consent or registration in Agricultural Engineering 321; S-U grades optional. Not offered 1983–84. W 8. Staff. A study of the principles and practices used in soil and water conservation, agronomic aspects of erosion control, water management, storage drainage, and irrigation.

372 (324) Soil Fertility Management Fall. 3 credits. Prerequisite: Agronomy 260 or permission of instructor. M W F 9:05. D. R. Bouldin. An integrated discussion of soil-crop yield relationships, with emphasis on the soil as a source of mineral nutrients for crops and the role of fertilizers and manure in crop production.

373 (331) 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. Pevery. 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 (411–412) Theoretical Meteorology I and II Fall and 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, winds in the planetary boundary layer, surfaces of discontinuity, mechanisms of pressure change, vorticity, and circulation.

447 (417) Physical Meteorology Fall. 3 credits. Prerequisite: a year of each of calculus and physics. Offered alternate years. M W F 12:20. W. W. Knapp. Primarily a survey of natural phenomena of the atmosphere, with emphasis on their underlying physical principles. Topics include composition and structure of the atmosphere, atmospheric optics, acoustics, and electromagnetic and solar terrestrial radiation, and principles of radar probing of the atmosphere.

450 (430) Synoptic Meteorology I Fall. 4 credits. Prerequisites: either Agronomy 441 and 442 or permission of instructor. Lecs., W F R 9:05, lab, F 2:30–4:25. D. A. Paine. The application of quasi-geostrophic theory as a diagnostic and forecast method, including the use of minicomputer products derived from the barotropic, baroclinic, and primitive equation numerical models. Laboratory work includes surface and upper-air analyses and thickness and vorticity computations using radiosonde data generating macroscale cyclogenesis.

452 (432) Synoptic Meteorology II Spring. 4 credits. Prerequisite: Agronomy 450 or permission of instructor. Lecs., W 1:25, lab, W 2:30–4:25, Staff. Interactivity between the atmosphere and biosphere is of central concern when considering many of the challenges of this decade, such as acid rain, severe winter cold stress, fossil-fuel burning, and CO₂ increase. Empirical and theoretical models of such interactivity are presented. A systems-level approach to environmental protection decisions is emphasized.

471 (401) Geography and Appraisal of Soils of the Tropics Spring. 3 credits. Prerequisite: Agronomy 260 or equivalent. S-U grades optional. Lecs., W 12:20; disc, F 2:30–4:25. A. Van Wambke. The evaluation 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. Produce principles whose applications are examined through discussions, problem solving, and independent reading.

473 (403) Organic Soils Fall. 2 credits. Prerequisite: Agronomy 260. Offered alternate years. W 1:25–4:25; some field trips will not return before 5:30. J. M. Dunkbury. A combination of field and laboratory study and discussion of the genesis, physical and chemical properties, agricultural uses, and management of organic soils.

474 (404) Forest Soils Fall. 3 credits. Prerequisite: Agronomy 260 or permission of instructor. Lecs., T R 1:25; lab, W 1:25–4:25. S. J. Rha. Ecosystem 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 (406) 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.
Lec, T R 8:30-10:25, M. W. VanWambeke. Land evaluation in tropical areas; water requirements in semiarid tropics. Management of tropical soils in relation with nitrogen, acidity, liming, phosphorus, and other nutrients. Effects of cropping systems on soils, soil conservation methods, and erosion control.

482 Transfer Processes in Soil  Spring. 4 credits. Prerequisite: Agronomy 260 or equivalent. Lec, 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 (466) Microbial Ecology  Spring. 3 credits Prerequisite: an elementary course in some facet of microbiology. Offered alternate years. Not offered 1983–84.
Lec, M W F 10:10; M. Alexander. An introduction to the basic principles of microbial ecology. Attention is given to the behavior, activity, and interactions 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 grade must be attached to 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 (506) 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. T R 11:15. G. W. Olson. Principles, practices, and research techniques in interpreting soil information and maps for planning, developing, and using areas of land.

611 Crop Simulation Modeling  Fall. 3 credits. Prerequisite: Biological Sciences 242 or 341. Recommended: computer programming experience. Offered alternate years. M W F 11:15. R. L. Staff. A study of existing crop models is followed by development and refinement of programs representing the students' work. The computer language CSMF is used. Emphasis is on quantitative formulation and testing of complex hypotheses related to crop growth. Carbon exchange, transpiration, micrometeorology, soil water supply, root functions, and dry-matter distribution in growing crops are covered.

612 Grain Formation  Spring. 3 credits Prerequisite: plant physiology. Development and refinement of programs representing the students' work. Morphology, physiology, and biochemistry of cereal, legume, and oil-seed formation, composition, storage, and germination. Emphasis is on the development of seed reserves during seed formation, stabilization of reserves during storage, and mobilization of reserves during germination. Coverage ranges from practical, "on-farm" problems to molecular biology.


666 (606) Advanced Soil Microbiology  Fall. 1 credit. Prerequisite: Agronomy 476 or permission of instructor. S-U grades only for graduate students. T R 12:20; M. Alexander. Discussion of current topics in special areas of soil microbiology. Particular attention is given to biochemical problems in microbial ecology.

667 (607) Soil Physics  Fall. 3 credits. Prerequisites: Agronomy 260 and a year of college physics or permission of instructor. Offered alternate years. Not offered 1983–84. M W F 11:15. R. D. Miller. A study of physical properties and processes in soils, with emphasis on basic principles.


670 Applications of Soil Physics  Spring. 3 credits. Prerequisites: Agronomy 482 or equivalent, and calculus. Offered alternate years. Three lectures per week. Hours to be arranged. R. J. Wagener. 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 (701) Soil Chemistry and Mineralogy  Fall. 3 credits. Prerequisites: Agronomy 260 and a year of physical chemistry, or permission of instructor. Offered alternate years. Not offered 1983–84. M W F 9:05. 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.]
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
Prerequisite: Animal Science 100. Laboratory: Lecture, W 2:45-4:25. Field trips during lab periods may last longer. R. E. Austic. Designed to acquaint students 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.
Lecture, T 10:10; lab, M T R 1:25-4:25. D. M. Galton. Introduction to the background and scientific principles of dairy production. Laboratories are designed to provide an understanding of production techniques. This course is a prerequisite for Animal Science 455.

251 Dairy Cattle Selection Spring. 2 credits.
Prerequisite: Animal Science 250 or permission of instructor. Laboratory: W 12:20-4:25. 1 all-day field trip. D. M. Galton. Emphasis on economical and type traits to be used in the selection and evaluation of dairy cattle. Practical sessions include planned trips to dairy herds in the state.

265 Horses Spring. 3 credits.
Prerequisite: Animal Science 100 or permission of instructor. Laboratory: R 1:25-4:25 H. F. Hintz, J. E. Lowe. Selection, management, feeding, breeding, and training of light horses.

270 Meat Science Fall. 3 credits.
Prerequisite: Animal Science 112, 220, or equivalent. Laboratory: T 8:15-10:15, M T W or R 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 Science 265 or permission of instructor. Recommended: Animal Science 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 Science 100, 230, or permission of instructor. Offered alternate years. Lecture, 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.
Lecture, T 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.

340 Systems Analysis in Animal Production Fall. 2 credits.
Prerequisite: Animal Science 100. Recommended: Animal Science 250 or equivalent. Lecture, T 10:10; P. A. Oltenacu. All-embracing systems concepts are applied to animal production management. Emphasis is on the principles and techniques needed in decision-making activities with examples of tactical decisions (short term) and strategic decisions (long term) from dairy herd management.

360 Beef Cattle Spring. 3 credits.
Prerequisite: Animal Science 110, 220, 221, or permission of instructor. Lecture, T 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 observing or participating in a beef enterprise.

370 Swine Production Fall. 3 credits. Limited to 85 students; each lab limited to 45 students.
Prerequisite: Animal Science 112, 220, 221 or permission of instructor. Lecture, T 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 decisions in various types of swine enterprises. Emphasis is on the production systems, herd selection and breeding programs, reproductive management, nutrition, herd health, and housing facilities. Laboratories are designed to extend and apply principles discussed in lecture and to provide students with the opportunity to apply management skills.

380 Sheep Fall. 3 credits.
Prerequisite: Animal Science 100. Recommended: Animal Science 112, 220, and 221.
Lecture, T 10:10; lab and disc periods. M 1:25-4:25 every other week. D. E. Hogue. The breeding, feeding, and 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.
Prerequisite: Animal Science 100 or permission of instructor. Lecture and lab, W 1:25-4:25. D. H. Beermann. Fundamental biological principles that influence growth and composition are presented. Principles and techniques of meat animal carcass evaluation are discussed and followed by student participation.

400 Livestock Production in Warm Climates Spring. 3 credits.
Prerequisite: either Animal Science 112, 220, or 221 or permission of instructor. Lecture, T 9:05, disc W 1:25-3:20. R. E. McDowell. An analysis of the limitations the tropical environment imposes on livestock production; restrictions on contributions of animals to farm incomes owing to limitations in genetic potential; feed resources; and social structures. The role of animals on small farms and the interdependence of humans and animals for food, services, and nonfood products are stressed. The application of principles introduced in lectures is examined through discussions, problem solving, 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 Science 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. Prerequisite: crop production and livestock nutrition. Offered alternate years.
Lecs, T R 12:20; disc, T 1:25. V. E. Gracen, R. E. McDowell, P. J. VanSoest. A review of tropical grasslands, sown pastures, and forage legumes and their use as feed resources; grass and legume legacies; establishment and management of pastures and feed source alternatives; forage quality and utilization; problems of utilization of tropical forages as hays and silages.

410 Principles of Animal Nutrition
Fall. 3 credits. Prerequisite: organic chemistry. Recommended: biochemistry. Consent required in registration in a biochemistry course.
M W F 11:15; 2 discs 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 Science 410 or permission of instructor.
F M W F 11:15. G. E. 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 alternate years.
Lec, T R 7–9 p.m. E. Bloom. A study of the alterations in the genetic material of animals and man by natural and man-made chemicals. Topics include attack on DNA by mutagens, repair of DNA lesions, gene and chromosome mutation, spindle poisons, mutations and cancer, genetic toxicity testing and risk assessment.

419 Animal Cytogenetics (also Toxicology 419)
Fall. 4 credits. Prerequisites: Animal Science 221, Biological Sciences 281, or permission of instructor. Lab, T R 9:05, lab, T or W 1:25–4:25, 2 other hours to be arranged. E. Bloom. A study of normal and abnormal chromosomes in higher animals. Lecture topics include chromosome organization, chromosome movement, cytogenetics of abirtschafts, parthenogenesises, chromosones and cancer, mitotic and meiotic errors, and human and clinical cytogenetics. In laboratories, students obtain chromosome preparations from various animals and use cytotechnical and photographic methods for karyotype analysis.

420 Quantitative Animal Genetics
Fall. 3 credits.
Lecs. 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 Science 221 or concurrent registration in Animal Science 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 Science 420 or concurrent registration in Animal Science 420. R 12:20. 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.

427 Fundamentals of Endocrinology
Fall. 3 credits. Prerequisites: human or veterinary physiology, or permission of instructor. Lecs, T R 9:05–4:25. W. R. Butler. Laboratory exercises are directed to demonstrate hormonal mechanisms for each of the major endocrine glands. Laboratory techniques include animal surgery, blood collection, and hormone radioimmunoassays.

430 Artificial Breeding of Farm Animals
Fall, starting August 17. 2 credits. Prerequisites: Animal Science 220 and 221 or their equivalent. Permission of instructor must be obtained at course enrollment. Lecs, T R 9:05 first seven weeks. Labs M T W T R 8:30–4:30, sec 1, Aug. 17–23; sec 2, Aug. 24–30. 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.

450 Immunophysicsology
Spring. 3 credits. Prerequisite: course work in immunology and animal physiology or permission of instructor.
Lecs, M W F 11:15. J. A. Marsh. Emphasis on the development and regulation of the immune system and the physiological parameters affecting and affected by immune functioning. Major topics include development immunology, immunoregulation, immunological involvement in reproduction and gonadal function, interrelationships between immune and endocrine functioning, and the immunology of aging. Other topics include tumor and transplantation immunology and autoimmune disease.

451 Lactation Biology
Spring. 3 credits. Prerequisite: either Animal Science 220 and Biological Sciences 231 or permission of instructor. Lecs, T R 9:05, lab, R 2–4:25. R. C. Gorewit. Emphasis is on mammary gland development, anatomy, physiological control of milk secretion, and biochemical synthesis of milk constituents in laboratory and farm animals.

452 Comparative Physiology of Reproduction of Vertebrates (also Biological Sciences 452)
Spring. 3 credits. Prerequisite: Animal Science 427 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, sexual behavior, gametogenesis, fertilization, embryonic development, care of the zygote environment and reproduction, immunological aspects of reproduction.

454 Comparative Physiology of Reproduction of Vertebrates, Laboratory (also Biological Sciences 454)
Spring. 2 credits. Prerequisite: Animal Science 452, concurrent registration in Animal Science 452, or permission of instructor.

455 Dairy Herd Management
Spring. 4 credits. Prerequisite: Animal Science 112, 220, 221, 250, or equivalents. Recommended: Agricultural Economics 302. Lecs, M W F 11:15; Lab. M T 1:25–4:25; one all-day field trip. W. G. Merrill and staff. Application of scientific principles to practical herd management, analyses of alternatives, and decision making. Laboratories, including farm visits, emphasize practical applications, problem solving, and discussion.

486 Immunogenetics (also Biological Sciences 486)
Spring. 4 credits. Limited to 25 students. Prerequisite: a course in immunology and Animal Science 221 or Biological Sciences 281, or permission of instructor. Lecs, M W F 10:10, disc, W or R 12:20. R. R. Dieten. The genetic control of a variety of cellular antigens and their use in understanding biological and immunological functions. The genetics of antibody diversity, antigen recognition, immune response, transplantation, and disease resistance.

490 Commercial Meat Processing
Spring. 3 credits. Prerequisite: Animal Science 290 or permission of instructor. Offered alternate years. Lecs, T R 9:05, lab, T or R 1:25–4:25. Field trip to commercial meat processing plants.
D. H. Beermann. A study of the classification, formulation, and production of commercially available processed meat products. Physical and chemical characteristics of meat and nonmeat ingredients; their functional properties; various meat technologies; microbiology; packaging, handling, and storage; and quality assurance are discussed.

497 Special Topics in Animal Sciences
Fall or spring 1–3 credits. Intended for students in animal sciences. Prerequisite: permission of instructor. S.U. grades optional.
May include individual tutorial study or a lecture topic selected by a professor. Since topics may change, the course may be repeated for credit.

498 Undergraduate Teaching
Fall or spring. 1 or 2 credits; 4 credits maximum during undergraduate career. Limited to students with grade-point averages of at least 2.7. Designed to consolidate the student's knowledge. A participating student assists in teaching a course allied with the student's education and experience. The student is expected to meet regularly with a discussion or laboratory section, to gain teaching experience, and regularly to discuss teaching objectives, techniques, and subject matter with the professor in charge.

499 Undergraduate Research
Fall or spring. 6 credits maximum during undergraduate career. Not open to students who have earned 6 or more undergraduate research credits elsewhere in the college. Limited to juniors and seniors with grade-point averages of at least 2.7. Affords opportunities for students to carry out independent research under appropriate supervision. Each student is expected to review recent 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 science 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.
An advanced course in amino acid and protein nutrition, with emphasis on the dynamic aspects of protein digestion, amino acid absorption, protein synthesis, amino acid metabolism, and nitrogen excretion. Discussions include nutritional interrelationships, amino acid and protein requirements, assessment of nutritional status, evaluation of protein quality, bioavailability of amino acids, and techniques of amino acid analysis. Emphasis is on basic principles and their application in animal and human nutrition.

604 Vitamins Fall. 2 credits
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 Spring. 3 credits.
Prerequisites: general biochemistry and microbiology.
Nutrition, biochemistry, physiology, taxonomy, and ecology of rumen bacteria and protozoa. Effects of rumen microbial ecology on ruminant nutrition. Manipulation of rumen fermentations to maximize host-animal performance.

609 Seminar in Poultry Biology Fall or 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 in or minor in animal science. S-U grades only.
M 11:15. Department faculty.

613 Forage Analysis Spring. 2 credits.
Prerequisite: permission of instructor.
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 or spring. No credit.
M 4:30.
Current research in nutrition is presented by visitors and faculty.

620 Seminar in Animal Breeding Fall or 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 graduates welcome to attend. S-U grades only.
W 4:30. R. H. Foote and staff.
Current research in reproductive physiology is presented by staff members, graduate students, and visitors.

640 Special Topics in Animal Science 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.
Hrs. 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 statistical data, 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)
Poultry Hygiene and Disease (Veterinary Medicine 255)

Basic Immunology, Lectures (Veterinary Medicine 315)
Basic Immunology, Laboratory (Veterinary Medicine 316)
The Population Biology of Health and Disease (Veterinary Medicine 330)

Health and Diseases of Animals (Veterinary Medicine 475)

Biological Sciences

The program of study in biology is offered by the Division of Biological Sciences. For course descriptions, see pp. 224–237.

Communication Arts


[114 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 1983–84.

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.]

150 Writing for Media Fall or spring. 3 credits. Limited to new communication arts majors—young men and transfers. Labs limited to 18 students.
Basis: writing for print and broadcast. A back-to-basics approach to writing for clarity and style, using news and feature writing as a framework. Media form and style are analyzed. Frequent writing assignments, both in and outside of class, are given. Typing skill required.

200 Theories of Human Communication Fall. 3 credits. Limited to 25 freshmen. No prerequisite. No prerequisites accepted or allowed to drop after the second week of classes. Letter grades only.
Lecs. 1, M 2:30; lab 1, T 9:05–11; lab 2, W 9:05–11; lab 3, W 12:20–2:15; lab 4, R 9:05–11.
R. D. Martin.
Lecture, discussion, and demonstrations are used to present an analysis of the process of learning, including barriers to effective listening and techniques for improving listening skills. Students will participate in frequent skill-building exercises and tests of listening involving comprehension and retention.

205 Parliamentary Procedure Fall or spring. 3 credits. Each section is limited to 40 freshmen students. No adds or drops allowed after the second week of classes. Letter grades only.
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.

215 Introduction to Mass Media Fall or spring. 3 credits. Limited to 125 nonfreshman students. S-U grades only.
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.

230 Visual Communication Fall. 3 credits. Limited to 100 nonfreshman and communication arts freshmen students. Not recommended for art or design majors. Project materials cost about $50–$30.
M W F 9:05. R. V. Stephen.
A basic course in the use and importance of visual communication methods and materials in today's society. Posters, charts, displays, photographs, slides, overhead projection, motion pictures, and television are among the topics discussed. Practical projects are assigned.

231 Art of Publication Spring. 3 credits. Each section limited to 30 nonfreshman students. Project materials cost $30–$50.
A basic course designed to explore visual concepts that increase communication effectiveness through
301 Oral Communication  Fall, spring, or summer. 3 credits. Each section limited to 24 sophomores, juniors, and seniors. Students missing the first week of classes without a University excuse are dropped so that others may register. No students accepted or allowed to exchange grades from the second week of classes.

Lett grades only.


Fall: Lec, R 10:15; lab 1, T 12:20—2:15; lab 2, T 2:30—4:25, plus out-of-class writing assignments. Staff.

Writing to explain and simplify scientific and technical instructions, descriptions and terminology, scientific or technical instructions, descriptions information presentation, summary, press releases, and scientific and technical instructions, descriptions and terminology. Weekly writing assignments include case studies.

316 Science Writing for the Mass Media  Fall. 3 credits. No drops after third week. Not open to freshmen.

Labs limited to 15 students.

Lec, R 12:20; lab 1, T 12:20—2:15; lab 2, T 2:30—4:25, plus out-of-class writing assignments. Staff.

Writing to explain and simplify scientific and technical topics for newspaper and magazine readers, radio listeners, television viewers, and educational-institutional consumers. Includes frequent writing assignments. Final projects include writing a newspaper or magazine article, writing a radio program, and writing and producing a television program. Students learn interviewing and research methods that ensure technical accuracy. Students should become familiar with the public policy and institutional milieu that have an effect on science writing and should reflect that knowledge in their writing.

318 Radio Writing and Production  Spring. 3 credits. Prerequisite: Communication Arts 215 or permission of instructor.

T 1:25—4:25  J. E. Lawrence.

Scripting and recording 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.

319 Television Writing and Production  Spring. 3 credits. Limited to 25 students. Prerequisite: Communication Arts 215 or permission of instructor. R 1:25—4:25  J. E. Lawrence.

Creation of television writing and production programs, from development of idea through research, scripting, and production.

331 Survey Research Methods  Spring. 3 credits. Limited to 20 junior, senior, or graduate majors; others by permission of instructor. Prerequisites: Communication Arts 200, 215, or permission of instructor.

M W F 10:10  R. E. Ostman.

Analysis of public opinion polls, market research, media audience ratings, readership surveys, and communication impact designs. Development of media surveys and research question to final report. Instruction in computer use of Statistical Package for the Social Sciences (SPSS) to assist in data analysis. Familiarity with basic statistical concepts helpful.

360 Scientific Writing for Public Information  Fall, spring, or summer. Not open to freshmen. 3 credits.


J. E. Hardy and staff.

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. Not open to freshmen. 3 credits.

M W F 9:05 or 12:20, or M 1:25 and T R 11:15.

Staff.

Students write as members of different organizations, in the position of supervisor, subordinate, colleague, and representatives of business, government, community, and other organizations. Emphasis on adapting tone to the audience and the purpose of the message. Weekly writing assignments include a variety of kinds of internal and external reports, memoranda, proposals, and letters. Assignments based on case studies.
An advanced multidisciplinary study of communication theory. Topics include personal interaction, channels of communication, and effective, sincere messages. Study includes intensive analysis of major communication theorists.

410 Organizational Communication Fall or spring. 3 credits. Limited to 25 junior, senior, or graduate communication arts students; others by permission. Prerequisite: Communication Arts 200 or equivalent.
Study of managerial communication practices in formal organizations, with emphasis on communication between supervisor and subordinate; evaluation of the structure and function of planned and unplanned organizational communication networks. Case studies assigned for discussion.

413 Writing for Magazines Fall or spring. 3 credits. Limited to juniors, seniors, and graduate students. No drops after third week. Extensive out-of-class writing assignments.
Fall: M 1:25–4:25; W. B. Ward; Spring: W F 8:15–9:45, staff.
A course in nonfiction freelance writing for magazines. Intensive writing to help students communicate messages through the medium of the printed word in magazines. Art and techniques of good writing are studied; magazines in many fields of interest are reviewed. All articles are analyzed and returned to the student to rewrite and submit to a magazine.

420 Print Media Laboratory Fall. 3 credits. Limited to junior, senior, and graduate communication arts majors. Prerequisite: at least one of Communication Arts 231, 314, 360, or 413.
Writing, editing, and layout practices practiced in publishing the Campus: Some additional outside work sessions may be required.

421 Broadcast Media Laboratory Fall. 2 credits. Limited to junior and senior communication arts majors. Prerequisite: Communication Arts 318 or 319. Not offered 1983–84.
Emphasis on production of television and radio programs for various audiences. Course work is done primarily through individual tutorial arrangement.

422 Print Media Laboratory Spring. 3 credits. Limited to junior, senior, and graduate communication arts majors. Prerequisite: Communication Arts 231, 314, 315, 360, or 413.
A continuation of Communication Arts 420.

Hours to be arranged.
A continuation of Communication Arts 421.

440 Photo Communication Fall or spring. 3 credits. Limited to 25 junior and senior communication arts majors; others by permission of instructor. For those with limited experience in photography. Students are expected to furnish their own supplies and equipment. Supplies will cost approximately $70–$80.
Basic photography: camera handling, film processing, projection printing, and photographic lighting. Photojournalism is emphasized during the latter part of the course.

460 Video Communication Fall, spring, or summer. 3 credits. Limited to 15 seniors or graduate students. Prerequisites: Communication Arts 200, 230, and permission of the instructor by application. Not offered 1983–84.
An overview of video communication applications. Examination of relevant organizational and visual communication theory. Development of basic competency with portable videotape recording equipment, audio and visual input to video and production, and postproduction planning and editing techniques.

496 Internship Fall, spring, or summer. 1–6 credits. Students must apply to department internship committee no later than spring pre-course enrollment for fall internships, or the fall pre-course enrollment for spring or summer internships. Prerequisites: communication arts junior or senior, 3.0 average in communication arts courses, and approval of committee.
V. Stephen and staff.
Structured, on-the-job learning experience under supervision of professionals in a cooperating organization. Students select a faculty adviser approved by department internship committee. Faculty adviser supervises the course and the awarding of credit and grade (S-U only). A learning contract is written between the faculty adviser and student, stating the conditions of the work assignment, supervision, and reporting. Minimum of 60 on-the-job hours per credit granted. May be repeated to a maximum of 6 credits.

497 Independent Study Fall or spring. 1–3 credits. Undergraduates must attach to their course enrollment material written permission from the faculty member who will supervise the work and assign the grade. Seniors must attach to their course enrollment for fall internships, or the fall pre-course enrollment for spring or summer internships. Prerequisites: communication arts junior or senior, 3.0 average in communication arts courses, and approval of committee. For those with limited experience in communication processes and social systems. Also an overview of video communication applications. Examination of relevant organizational and visual communication theory. Development of basic competency with portable videotape recording equipment, audio and visual input to video and production, and postproduction planning and editing techniques.

498 Communication Teaching Experience Fall or spring. 1–3 credits each semester. Limited to juniors and seniors. Intended for undergraduates desiring classroom teaching experience. 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.
Staff. Group or individual study under faculty supervision. Students will concentrate on localizing, assimilating, synthesizing, and reporting exiting knowledge on a selected topic. Attempts to implement this knowledge in a practical application are desirable.

499 Independent Research Fall or spring. 1–6 credits. Limited to senior and graduate students. 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.
Periodic meetings with the instructor cover investigation. An exploration of the scope of the field and the interrelationships of its various branches.

601 Intercultural Communication Spring. 3 credits.
A systems approach of communication between cultures and subcultures, and ethnic and other differences. Also examined are the subtleties and complexities of nonverbal behavior in cross-cultural transactions. Examples are drawn from ethnonlinguistic and cross-cultural studies.

612 Seminar: Interpersonal Communication Fall. 3 credits.
A study of recent advances and research in leadership, small-group interaction, and communication networks. New developments are examined as they relate to business, administration, and education.

614 Scientific Writing for Scientists Fall or spring. 3 credits. Prerequisites: research in progress and permission of the instructor.
Workshop for students with research in progress. Discussion and lectures on writing a journal article, theses, reports, and proposals. Emphasis is on the scientific writing, relation of rhetoric and linguistics to scientific writing, process of publication and reviewing, preparation of tables and illustrations, and on advanced and special problems in organization, paragraph development, sentence structure, and usage.

620 Communication in Organizations Fall. 3 credits. Prerequisite: permission of instructor.
Review of theories, research, and practical systems as they relate to human communication effectiveness in organizations. Includes components of interpersonal communication, intragroup and intergroup communication, communication processes involved in organizational goal setting, renewal and change.

624 Communication in the Developing Nations Fall. 3 credits. Limited to seniors and graduate students.
Hours by arrangement. R. Colle.
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.

631 Studies in Communication Fall. 3 credits.
Limited to graduate students in communication arts; others by permission of instructor.
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.

632 Methods of Communication Research Fall. 3 credits. Limited to graduate students.
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.

640 Seminar in Organizational Communication Spring. 3 credits. Open to seniors by permission.
Communication functions and systems in business, industry, labor, education, etc., from the perspectives of academic authorities and managers. Development of conceptual schemes for analyzing components of organizational and human communication effectiveness.

643 Impact of Communication Technologies Fall. 3 credits.
A study of emerging technologies of communication such as computer-based information systems and satellite and their potentials for influence on communication processes and social systems. Also examines the impacts of previous communication innovations from cave painting to television.
Education

650 Advanced Communication Seminar  Spring. 3 credits. Primarily for graduate students but open to seniors. M 10:10–12:45. 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 nonformal education projects, rural development programs, and government public information campaigns.

651 Seminar: Communication Issues  Fall and spring. No credit. S-U grades only. Alternate F, S. A departmental seminar that deals with contemporary issues in communication, especially those related to the use of mass media as sources of information and influence, organizational communication, and intercultural communication.

690—891 Communication Teaching Laboratory  Fall and spring. 1—3 credits. Limited to graduate students. Prerequisite: permission of the faculty member who will supervise the work and assign the grade. Students must use the faculty member's section number to register. Graduate faculty.

Designed primarily for graduate students who want experience in teaching communication courses. Students work with an instructor in developing course objectives and philosophy, planning, and teaching.

780 Advanced Communication Projects  Fall or spring. 3 credits. Limited to communications arts graduate students. May not be repeated. Students must use the faculty member's section number to register. Graduate faculty.

Independent studies and projects are carried out in conjunction with selected undergraduate courses.

895 Directed Graduate Study  Fall or spring. 3–6 credits. S-U grades only. Students must use the faculty member's section number to register. Graduate faculty.

Education

271 Sociology of Education  Spring. 3 credits. S-U grades optional. T 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 system. The 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. Fall: M W F 11:15. R. E. Ripple. Spring, M W F 9:05. 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. The spring course is designed especially for students in the College of Agriculture and Life Sciences and related units interested in human intelligence, development and the management of the teaching-learning process. Special application for students of departments such as communication arts, rural sociology, and extension education, who will be faced with problems of technology transfer or behavioral science research.

312 Learning to Learn  Spring. 3 credits. Prerequisite: one or more courses in psychology or educational psychology. T R 12:55. J. D. Novak. This course is intended for persons interested in the improvement of learning strategies and the application of new ideas and methods to improve educational programs. Lectures and discussions are based on assigned readings and the contributions of class members. The major focus of the course is how and why concepts play a central role in human learning. Concept mapping and other strategies for educating will be used.

317 Psychology of Adolescence  Spring. 3 credits. Prerequisite: introductory psychology. S-U grades optional. T R 10:25–12. 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 Teaching Agriculture  Spring. 2 credits. Required of persons who plan to enter the student teaching program. Lect: M 8–10:45. Lab to be arranged. W. E. Drake. An introduction to the origin and development of curricula, and methods of teaching agriculture in secondary schools. Purposes are (1) to provide exploratory experience as agricultural educators in teaching, extension, and other professions, and (2) to prepare prospective teachers for participation in the resident student-teaching program leading to teacher certification.

335 Youth Organizations  Spring. 3 credits. Prerequisite: introductory psychology or permission of instructor. Lect. T R 10:10; lab to be arranged. R. W. Tenney. The role of selected youth organizations in providing educational experiences for youth. Factors affecting membership, program delivery, 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 and gain experience with a recognized youth organization is required.

340 Theories of Teaching  Fall. 3 credits. Not offered 1983–84. M W 2:30–3:45. G. J. Posner, K. A. Strike. This course is intended to assist the student in conceptualizing the process and contexts of teaching in school and nonschool settings. Attention is focused on understanding theories of teaching and how they can be applied to the educational process and to current social issues, including how to be an intelligent consumer of psychological research. Theories are examined to shed light on current controversies regarding the effectiveness of alternative types of schooling.


353 Introduction to Educational Statistics  Spring. 3 credits. Prerequisite or corequisite: Education 352 or permission of instructor. T R 9:05–11. J. Millman. A study of common univariate and multivariate statistical procedures encountered in educational and psychological inquiry. Microcomputers and minicomputers are used to explain statistical concepts and to compute statistical indices. A mastery learning-teaching style is employed.

370 Issues in Educational Policy  Spring. 3 credits. M W F 10:10. K. A. Strike. An examination of selected policy issues in current education. Included are such topics as equality of educational opportunity; student, parent, and teacher rights; and educational politics. Issues are treated from legal, sociological, and economic perspectives.

378 Economics of Education  Fall. 3 credits. S-U grades optional. T 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 earning power, 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.

380 Independent Honors Research in Social Science  Fall or spring. 1–6 credits. Limited to students who have met requirements for the honors program. S-U grades optional. A maximum of 6 credits may be earned in the honors program. Staff.

401 Our Physical Environment  Fall or spring. 3 credits. Prerequisite: permission of instructor. Charge for lab supplies. Approximately $7. T 12:25–4:25. V. N. Rockcastle.

A practical, relatively nonmathematical study of some basic relationships and physical interactions in the environment, with an 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.

403 Environmental and Natural History Writing  Spring. 3 credits. Prerequisite: completion of freshman composition. W 7:30–10 p.m. R. B. Fischer.
For those who want to develop skills in changing environmental attitudes and behavior, 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 Fall or spring 3 credits each semester. Limited to upperclass and graduate students. Prerequisites: basic biology and ecology and permission of instructor. Education 404 is not a prerequisite to 405.

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 if the third module is elected.
T R 9:05-11:05. An overview of educational measurement organized into three, 1-credit independent modules, each one of which can be elected 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-cheating, teaching to the test, invasion of privacy, and testing what a person really knows. Hand-on experience selecting and constructing educational measures will be the topic of the second module. During the last third of the term, a module 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
T R 10:10-12:05. D. E. Hedlund. Designed to develop skills for, and understanding of, effective interpersonal communication and interaction. The course includes regularly 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.
T R 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 later, 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: 5 credits. Prerequisite: permission of instructor. 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 WRF 8-3. A. L. Berkey and staff. Directed participation in teaching agriculture at the secondary school level. Programs include an intensive, four-week on-campus period where 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. H. D. Sutphin. 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 545 may be taken concurrently.
T R 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, and field trip, and 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. Variable 1--3 credits. R. 3. H. D. Sutphin. An introduction to microcomputer technology and applications for instructional programs, with an emphasis in education. This course will include hands-on activities and such topics as computer terminology, microcomputer equipment selection and operation, and overview of BASIC program language, language alternatives, and selecting and developing educational software programs.

472 Philosophy of Education Fall. 3 credits.
T 2:30-4:25. K. A. Strike. A study of current and historical issues in the philosophy of education. Questions of ethics, political philosophy, and the theory of knowledge are examined, and linked to current educational issues.

499 Undergraduate Research Fall or spring. 6 credits maximum during undergraduate career. Limited to students with grade-point averages of at least 2.7. S-U grades optional.
T R 10:10-12:05. R. L. Bruce. 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.

547 Improvement of College Teaching Fall, spring, or summer. 2 credits.
T R 10:10-12:05. D. E. Hedlund. 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.

567 Administration of Higher Education Spring 3 credits.
M--R 10--12 and 2--4. Staff.
This intensive, three-week course focuses on areas of primary importance to those who want an overview of the theory and practice of higher education. Topics covered in the course include planning, organizing, administering, and evaluating. Also, individualized research papers will be expected.

590 Special Topics in Education Fall, spring, or summer. 1--3 credits. Prerequisite: permission of instructor. S-U grades optional.

477 Law and Educational Policy Spring 3 credits. Offered alternate years.
T 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.

481 Educating for Community Action Fall. 3 credits.
MT 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.

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 adviser, 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 2.7. S-U grades optional.
T R 10:10-12:05. R. L. Bruce. 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.
T R 10:10-12:05. R. L. Bruce. 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.

547 Improvement of College Teaching Fall, spring, or summer. 2 credits.
T R 10:10-12:05. D. E. Hedlund. 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.

567 Administration of Higher Education Spring 3 credits.
M--R 10--12 and 2--4. Staff.
This intensive, three-week course focuses on areas of primary importance to those who want an overview of the theory and practice of higher education. Topics covered in the course include planning, organizing, administering, and evaluating. Also, individualized research papers will be expected.

590 Special Topics in Education Fall, spring, or summer. 1--3 credits. Prerequisite: permission of instructor. S-U grades optional.
603 Teaching Mathematics  Fall 3 credits  
**Offered:** Fall or spring. 1 credit: S-U grades only. 
T R 2:30–3:45. H. A. Geselmann. 
Intended to provide competence in presenting mathematics using various approaches—discovery, audiovisual aids, laboratory techniques. 
individualized instruction, use of games, puzzles; acquaintance with teaching resources; geometrical constructions, problem solving, discussion of the slow learner. Each student selects a project and presents it to the class.

606 Seminar in Science and Environmental Education  Fall or spring. 1 credit. S-U grades only. 
T 7:30–9:30 p.m. V. N. Rockcastle, R. B. Fischer. 
Coordinates various interest groups in science and environmental education. Discussions center about curriculum development, research and thesis writing, and current problems.

611 Educational Psychology  Fall. 3 credits. 
**Prerequisite:** introductory psychology: S-U grades optional. 
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. 
The course provides an introduction to the problems and processes 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 presents reasonable familiarity with descriptive statistics and elementary measurement concepts as reliability, validity, response bias, measurement error, and the like. 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 511, or permission of instructor. 
R T 9:05. J. D. Novak. 
Practical application of concepts and methods in the classroom as well as in small-group processes. Included are the design and evaluation of laboratory exercises. Emphasis on the theory and practice of facilitating small-group processes. Included are the design and teaching of structured group exercises for the classroom, the use of groups in counseling, and an examination of the consulting role as an educational strategy.

616 Affective Education  Spring. 3 credits. 
**Prerequisite:** permission of instructor. 
This course examines the conceptual base and the methodology of teaching for objectives in the affective realm. The first part of the semester is devoted to the intrapersonal dynamics of individual development and the relationship of affective and cognitive learning. The second part focuses on the interactive nature of the teaching-learning transaction and the effective use of small-group dynamics in teaching. The capability to design teaching-learning experiences that incorporate affective objectives is a major goal. The course is largely experiential, providing participation in a variety of approaches to affective education.

620 Internship in Education  Fall or spring. 2–4 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. 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 for students to develop teaching competencies based on their individual needs and interests. Development of self-evaluation skills is included. A class project on the selection or development of instructional materials is required.

633 Curriculum in Agricultural and Occupational Education  Fall. 3 credits. 
Current situations affecting occupational education curricula are examined. Principles, objectives, and sources of information are developed for planning curricula. Strategies for developing occupational courses are examined. Consideration is given to planning, developing, and managing work experience programs. Participants have an opportunity to observe ongoing programs at the secondary and two-year-college levels and to pursue individual interests in curriculum improvement.

643 Structure of Knowledge and Curriculum  Spring. 3 credits. 
**Prerequisite:** permission of instructor. 
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 selected according to their own background and interest. Students develop their material 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 511, concurrent registration in Education 511, or permission of instructor. 
An examination of the basic elements involved in making curriculum decisions, and an analysis of current approaches to curriculum. Students learn to analyze a curriculum in the context of a conceptual framework. This course is the basic graduate course in curriculum.

650 Methods of Educational Inquiry  Fall. 3 credits. 
Techniques of empirical research are offered in three independent units: (a) survey of empirical approaches to social science research; (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.

651 Writing a Thesis Proposal  Fall. 1 credit. S-U grades only. 
Procedures for developing and writing a master's or doctoral thesis proposal. Emphasis will be given to identifying a significant topic, conducting a literature review, describing a group mini-research study, recognizing weaknesses in illustrative proposals, and clear and concise writing. Students will be provided ample assistance in constructing a brief thesis proposal on their own.

654 Evaluation for Program Management  Spring. 1–3 credits. 
**S-U grades optional.** 
The course will consist of three modules, each for one credit:

1) Evaluation as a Programming Function. Fitting an evaluation to decision needs; program monitoring; evaluation and information systems. No prerequisite.


3) Practicum in Program Evaluation. Directed practice in the design and conduct of a "live" evaluation. Prerequisite: Module 1.

659 Special Topics in Research Methods  Fall. 1–3 credits. 
**Prerequisite:** permission of instructor: S-U grades optional. 
Hours to be arranged. J. Millman. 
Consideration of new techniques and current topics in educational research design, measurement, or evaluation of programs, products, and personnel. The course is divided into three independent modules. Students may elect one to three modules in any combination.

661 Administration of Educational Organizations  Fall. 3 credits. 
Perspectives on the administration of educational organizations. Consideration of classic and contemporary organization theories and their application to both public and private sectors. Intended for students who are considering careers as educational administrators as well as for those who want to further their understanding of schools as organizations.

662 Ethical Issues in Educational Administration  Spring. 3 credits. 
Offered alternate years. 
T 2:30–4:30. E. J. Haller, K. A. Sike. 
This course deals with the identification and conceptualization of ethical problems likely to arise in administering an educational organization. Typical problems concern rights of parents, teachers, and students; equity and due process in hiring, retention and promotion, and race relations. The course integrates case studies with appropriate philosophical literature.

663 Governance of Public Education  Fall. 3 credits. 
Offered alternate years. 
Consideration of the structure of control in public education. Relationships among federal, state, and local agencies and the administrative roles in school district. Considerable attention is directed to social and political analysis of the community.
664 Educational Finance  Fall. 3 credits S-U grades optional.
R 3:35–6. D. H. Monk. An analysis of the distribution and utilization of public and private resources for educational purposes. The discussion will revolve around the issues of equity, efficiency, and freedom of choice. Alternative methods of financing schools will be evaluated, and the legal and moral issues raised by such questions as “Who pays?” and “Who benefits?” will be discussed. Specific attention will be given to budgeting, accountability, and productivity. An opportunity will be provided to examine the dynamics of planned technological change.

665 Administrative Decision Making  Spring. 3 credits. S-U grades optional.
W 3:35–6. D. H. Monk. An introduction to alternative theories of decision making and their relevance to the field of educational administration. Emphasis will be placed on the analysis of the linkages that exist among different levels of decision making within educational systems. Topics will include the impact of state and federal policy on educational organizations, collective bargaining, student decision making, and the dynamics of planned technological change.

673 Seminar in Dewey’s Philosophy of Education  Fall. 3 credits. S-U grades optional. Prerequisite: work in philosophy and permission of instructor.
R 3:30–5. B. Govin. A detailed analysis of some selected major works of Dewey (Democracy and Education, Experience and Education, Art as Experience). One objective of the seminar is to help students learn how to read Dewey and to compare and apply his ideas about education to current problems and issues.

674 History of American Education  Fall. 3 credits.
M 3:35–5:15. Instructor to be announced. An examination of American schools, colleges, and other educational agencies from colonial beginnings to the present. The attempt is made to view education in the context of the evolution of American norms and values.

675 Educational Policy Development and Decision Making  Fall. 3 credits. S-U grades optional.
R 3:35–5:30. E. J. Haller. This course provides an introduction to the policy-making process in all phases of the educational institution. After a consideration of the nature of public policy, topics included are governmental responsiveness, power and influence in policy making, political parties and interest groups, and administration as policy making. The class is organized as a seminar. Each student prepares and presents a paper relevant to one of the topics considered.

678 Planning Educational Systems  Spring. 3 credits. S-U grades optional.
M 2:30–4:30. D. H. Monk. A seminar focused on a comparative analysis of educational planning as it is practiced in both industrialized and developing nations. Topics will include the range of planning theories, such-demand approach to educational planning, benefit-cost analysis, and incentive models of planning. Attention will be given to case studies that will be selected in accordance with students’ interests. The political and economic implications of attempts to plan education will be emphasized.

M 2:30–4:30. D. H. Monk. A seminar dealing with the planning, financing, and administration of higher educational organizations. Topics include a critical assessment of current approaches to macrolevel planning as well as the analysis of special problems associated with the financing and administration of particular types of colleges and universities.

681 Designing Extension and Continuing Education Programs  Fall. 3 credits. Prerequisite permission of instructor.
T 1:25–3:20. R. L. Broadwell. Designed to help students understand current theories, concepts, principles, and procedures relevant to the process of developing programs and curricula for the continuing education of adults. Emphasis is on such key areas as the nature and role of programming, situation analysis and needs identification, choosing among alternative courses of action, setting program objectives, and program organization.

682 Community Education Development  Fall. 3 credits.
W 2:30–5. J. L. Compton. Not offered 1983–84; first offered 1984–85. For students who have interest or experience in education or development programs where community is an important concern. An examination of the concept of community, changes in community life, the analysis of community; alternative strategies for community development; patterns of response to community by unique community, cooperative extension, and government service agencies; and such functional dimensions of community education programming as participatory decision making, paraprofessionals, volunteers, leadership development, council formation and function, interagency coordination, and change-agent roles.

683 Administration of Nonformal Education  Spring. 3 credits. Prerequisite: prior work experience preferred.
W 1:20–4. J. G. Broadwell. An overview of selected theories, principles, and strategies applicable 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.

684 Adult Education Programs: Organization and Direction  Fall. 3 credits.
F 1:25–4:20. H. D. Sutphin. Alternative procedural models for organizing and conducting adult education courses are presented. Guidelines and procedures for implementing the models in secondary and postsecondary school settings are emphasized.

690 Research Seminar  Fall or spring. No credit.
M 4–5:30. J. P. Bail. Presentation of current research in the field of education by graduate students and staff. Opportunities to discuss methodology, findings, and other aspects of research.

711 Contemporary Issues in Educational Psychology  Spring. 3 credits. S-U grades optional.
M W F 11:15–12:20. J. A. Dunn. 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 education; and the development of educational psychology for developing countries–peoples; is U. S. psychology good enough? Part II: the impact of research on educational practice; principles of instructional system design and programming; contributions of learning theory to human instruction; education 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.

712 Seminar in Educational Psychology and Curriculum  Spring. 3 credits. Prerequisite: permission of instructor. S-U grades optional. Not offered 1983–84.
Hours to be arranged. R. E. Ripple Selected aspects of the relationship between curriculum and the psychology of education. Emphasis is on the psychology of human learning and implications for structuring learning experiences and curriculum development. Appropriate for graduate students in educational psychology, curriculum, and instruction and for others with interest in the relationship between psychology and curriculum.

715 Seminar in Counseling Psychology  Fall or spring. Variable credits. S-U grades only.

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. Ripple, R. L. Bruce. Dealing with adult development and learning behavior from points of view of 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 and continuing education, and community service education and for others interested in adult development and learning.

730 Seminar in Agricultural and Occupational Education  Spring. 1–3 credits. S-U grades optional.
R 2:30–4:25. H. D. Sutphin. For master’s degree candidates who have had teaching experience and doctoral candidates with majors or minors in agricultural and occupational education. Emphasis is on current problems and research and includes discussion of student research proposals.

735 Teacher Preparation in Agriculture  Fall. 3 credits. Prerequisite: teaching experience in agriculture.

736 Occupational Education Program: Administration and Supervision  Spring. 3 credits. Offered alternate years.
T 3:35–4:50; special sessions to be arranged. J. P. Bail. Practices and procedures of organizing, administering, and supervising programs of occupational education at the secondary and postsecondary level are stressed. The role of the director in providing leadership in improving instruction, designing programs, and using resources at federal, state, and local levels is considered.

738 Evaluating Programs in Occupational Education  Spring. 3 credits. T 1:25–3:20. Labs to be arranged. W. E. Drake. This course examines objectives, criteria, and strategies for evaluating programs of occupational education in secondary and postsecondary schools. Evaluation models, case studies, and evaluation as a function of program planning are considered. Participants examine the roles of supervision in evaluation and have an opportunity to develop and apply evaluative instruments. Field trips and resource persons provide opportunities to observe actual evaluation problems and procedures.
as community organization, community-based learning, indigenous facilitators and leaders, extension generalists and specialists, residential training, and research-training linkages. Case materials on alternative extension models and intercounty experiences provided an empirical base.

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. 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. Limited to students working on theses or other research and development projects.

Related Course in Another Department

Historical Roots of Modern Psychology (Psychology 490)

Entomology


Courses by Subject

Apiculture: 260, 262, 264
Behavior: 562
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: 483, 685, 690
Systematics and acarology: 331, 332, 621, 631, 633, 634, 636, 674

200 Insects and Man Fall. 2 credits. S-U grades optional. Intended for students in all colleges. Lecs., T R 11:15. E. M. Raftensperger. 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 Biology Fall. 3 credits. Prerequisite: Biological Sciences 101–102 (may be taken concurrently) or equivalent. Lab, W 11:15; M T W or R 2–4:25. G. C. Eckworth. Introduces the science of entomology by focusing on basic principles of systematics, morphology, physiology, behavior, and ecology of insects. The laboratory in early fall includes field trips to collect and study insects in the natural environment. A small collection stressing ecological categories is required.

241 Applied Entomology Spring. 3 credits. Prerequisite: Biological Sciences 101–102 or equivalent. Lecs., T R 10:10, lab, M T W R or F 2-4:25. E. M. Raftensperger.

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.
370 Pesticides in the Environment (also Toxicology 370) Fall. 2 credits. Prerequisites: Biological Sciences 101-102 or equivalent.
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.

441 Seminar in Insect Pest Management Spring. 1 credit. Limited to 10 students. Prerequisite: Entomology 241 or 444 or permission of instructor.
S-U grades only.
Hours to be arranged. A. M. Shelton, A. J. Sawyer.
Discussion of topics in pest management, with an emphasis on insect pest management. Group discussion will focus on critical readings of the literature. Topics include the philosophy and foundations of pest management and an examination of its principal tools.

443 Pathology and Entomology of Trees and Shrubs (also Plant Pathology 443) Fall. 5 credits. Prerequisites: either Plant Pathology 301 and Entomology 241 or equivalent.
For description see Plant Pathology 443.

444 Integrated Pest Management (also Plant Pathology 444) Fall 4 credits. Prerequisites: Biological Sciences 260 or 360, Entomology 212 or 241, and Plant Pathology 301 or their equivalents or permission of instructor.
Lecs, M W F 9:05; lab, M or W 1:25-4:25. P. A. Arnesson, 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: either Entomology 212 and Veterinary Medicine 330 or permission of instructor. Offered alternate years.
A survey of arthropods of public health and veterinary importance, with emphasis on transmission dynamics of pathogens, biocenoses of vector populations, and current control concepts. Morphology and taxonomy of selected groups are examined in the laboratory, with additional exercises in vector-pathogen relationships and epidemiological techniques.

453 Insect Pathology Spring. 4 credits. Prerequisites: Entomology 212 or 241 or permission of instructor. Recommended: a course in microbiology. Offered alternate years. Not offered 1983–84.
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 insects 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) Fall. 2 credits. Prerequisites: Biological Sciences 360 and Entomology 212, or their equivalents. Recommended: concurrent enrollment in Biological Sciences 457. Offered alternate years.
Ecological and evolutionary principles are integrated by thorough examination of outstanding investigations. Topics discussed include the factors responsible for the great diversity of insects, adaptive syndromes associated with climate, natural history of arthropod guilds, impact of insects on terrestrial vegetation, population regulation, and the contrast between natural and managed ecosystems.

457 Insect Ecology, Laboratory (also Biological Sciences 457) Fall. 2 credits. Limited to 16 students. Prerequisite: concurrent enrollment in Biological Sciences 455. Offered alternate years.
Lab, W 1:25–4:25; 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.

471 Ecology and Systematics of Freshwater Invertebrates Spring. 4 credits. Prerequisite: Entomology 212. Recommended: Biological Sciences 360–462–464.
Lecs, T R 9:05; labs, T R 1:25–4:25; with overflow section M W 1:25–4:25 (see instructor). One evening prelim: B. L. Peckarsky.
The lecture explores the life histories, behavior, feeding ecology, and relationships to distribution of macroscopic freshwater invertebrates with an emphasis on insects. The laboratory involves field collections and laboratory identification of invertebrates, and stresses the use of keys. Students may elect to conduct ecological field projects or to study the systematics of freshwater invertebrates in more depth.

483 Insect Physiology Spring. 4 credits. Prerequisite: Entomology 212.
Lecs, M W F 11:15; lab, W or F 1:25. 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 common 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.
Staff.

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.
Staff.

Lectures on the classification, evolution, and biocenoses of the Diptera and Hymenoptera. Laboratory studies on the literature, characters, and classification of representative genera and species of these orders, based on adult and immature stages.

634 Special Topics in Systematic Entomology Fall or spring; taught on demand. 2–4 credits. Prerequisite: permission of instructor.
Hours to be arranged. Staff.
Lectures on the classification, evolution, and biocenoses 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 insect systematic entomology. Topics to be announced, including current theoretical issues in insect classification, evolution, and biogeography.

540 Pest Management: Quantitative Aspects Fall. 3 credits. Prerequisites: Entomology 444 and a course in calculus, probability, and biophysics.
Quantitative aspects of the development of pest and agricultural resource management systems. Systems analysis, modeling and simulation, sampling, quantitative biological research, and economics are covered in lectures. Presentations of philosophical issues and current and classical literature.

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

664 Seminar in Coevolution between Insects and Plants Spring. 2 credits. Limited to 15 students.
Prerequisites: entomology, ecology, evolution, and ecology or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1983–84.
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 471 or Biological Sciences 462, 464. Offered alternate years. Not offered 1983–84.
Hours to be arranged. B. L. Peckarsky.
Discussion and analysis of current topics in the ecology of streams and lakes, including synthesis of key papers in the field, and culminating in a project on personal research or ideas by students are encouraged.

674 Principles of Systematics (also Biological Sciences 674) Spring. 4 credits. Prerequisite: Entomology 331 or introductory systematics course in another field of biological sciences.
Lecs, M W 1:25; labs, M W 2–4:25, disc. hours to be arranged. Staff (G. C. Eckworth, co-instructor).
An introduction to modern theory and methods of systematic biology. Lectures on theoretical systematics, including species concepts, classification, phylogenetics, biogeography. Laboratories include modern methods of finding characters (such as comparative morphology, karyology, electrophoresis, ontogenetic sequencing).
100 Floriculture and Ornamental Horticulture: An Introduction
Fall. 3 credits. Principally for freshmen. S-U grades optional for students not specializing in floriculture and ornamental horticulture. Estimated cost of field trip, $5–10. Lecs, M W 6, lab, T or W 2–4:25. Faculty. An introduction to basic plant physiology and plant processes, control of the plant environment, and the floriculture and ornamental horticulture industry and opportunities. A required one-day field trip is made to nearby commercial enterprises.

105 Floral Design
Fall or spring. 2 credits. Each laboratory limited to 22 students. Prerequisite: permission of instructor; preference given to plant science majors. Emphasis on floristry in education, design, and journalism. $50 charge to purchase instructional plant materials that the student will keep. Enrolled students who do not attend the first class and fail to notify the secretary in Plant Science Room 20 of their absence will automatically be dropped from the course.

213 Woody Plant Materials
Spring. 4 credits $20 fee for lecture/laboratory manual. Lecs, T R 9 05, lab, T 2–4:25 and W or F 2–4:25. R. G. Mower. A study of the trees, shrubs, and vines used in landscape plantings. Emphasis is on winter identification and their values for use as landscape material.

312 Garden and Interior Plants I
Fall. 3 credits. $20 fee for lecture/laboratory manual. Lecs, T R 10:10, lab, T 2–4:25. 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 in commercial 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. Principally for landscape architecture majors. $20 fee for lecture/laboratory manual. Lecs, M W 9:05, 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. Opportunity for independent study is provided.

314 Turfgrass Management
Fall. 3 credits. Prerequisites: Agronomy 200. Recommended: Biological Sciences 242 or permission of instructor. Cost of supplies, $10. One 3-credit field trip required: cost, $5. Lecs, M F 11:15, lab, F 12:20–2:15. A. M. Petrovic. The scientific principles, practices, and materials for the construction and maintenance of lawn, sports, and utility turfgrass areas. Environmental effects on growth are also studied.

318 Advanced Turfgrass Management
Fall. 2 credits. Prerequisites: Floriculture 310 and 311, 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. Prerequisites: Floriculture 312 or permission of instructor. $20 fee for lecture/laboratory manual. Lecs, M W 11:15, lab, M 2–4:25 (two sections to be arranged). 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 indoor plants such as orchids, cacti and succulents, gesneriads, ferns, palms, and bromeliads. The second seven weeks are devoted to outdoor herbaceous plants such as annuals, perennials, bedding plants, irises, as well as other spring-blooming bulbs and perennials. 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. Lab materials charge, $50. Cost for field trips, $50 plus room and meals. Lecs, W F 11:15–12:20, 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 floral arrangement and design. Required field trips made to flower shows and to wholesale and retail florist establishments.

342 Taxonomy of Cultivated Plants (also Biological Sciences 342)
Spring. 4 credits. Lecs, M W 10 0, labs, M W 2–4:25. J. W. Ingram, Jr. A study of ferns and seed plants, their relationships, and their classification into families and genera, emphasizing cultivated plants. Emphasis is on gaining proficiency in identifying distinguishing families and to 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 or other course in plant physiology. Field trip fee, $10. Lecs, T R F, lab, R 125–4:25 (except field trips lasting until 6:30 p.m.). Evening prelims. K. W. Mudge. Propagation of plants from seed and by vegetative techniques includes cuttings, tissue culture, grafting, layering, etc. 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 or 341. Permission of instructor. Lecs, 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.

421 Principles of Nursery-Crop Production
Fall. 4 credits. Prerequisite: Floriculture 401. Fee to cover special costs associated with the course, $15. Lecs, M W 9:05, lab, M 12:20–2:15, 2:30–4:25; field trips are included. G. L. Good. Problems 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.

424 Principles of Florist-Crop Production
Spring. 4 credits. Limited to 40 students. Preference given to juniors. Prerequisites: Floriculture 401 and Biological Sciences 242, 342 (may be taken concurrently), or equivalent, or permission of instructor. Cost for field trip and special laboratory supplies, $25. Lecs, M W F 9:05, lab, R 2–4:25. J. G. Seeley. Commercial production of florist crops. Emphasis on principles of culture of ornamental plants as influenced by greenhouse environment. Three field trips are made to commercial greenhouses.
Practicing in outdoor architectural sketching, primarily in watercolor, but including pen and ink, pencil, and colored pencil. Studio will develop working sketches into complex renderings. Principles of perspective are taught and applied. For any student who wishes to develop skill in handling watercolor. Outside-of-class skecthbook 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. R. T. Trancik. Progress 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.

214 Watercolor
Spring. 2 credits. Prerequisite: Floriculture 211 or equivalent. S-U grades optional. 6 studio hours scheduled in 2- or 3-hour units between 9:05 and 12:05. R. T. Trancik. A survey of watercolor techniques. Subject matter largely still life, sketchbook, and on-the-spot outdoor painting.

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. Eliot or R. T. Trancik. For students who want to attain proficiency in a particular type of illustration or technique.

417 Scientific Illustration
Fall 2 credits. Prerequisite: Floriculture 211 or 316 or equivalent. S-U grades optional for graduate students only. 6 studio hours scheduled between 9:05 and 12:05. R. T. Trancik. A survey of methods of illustration. Training in techniques of accurate representation in media suitable for reproduction processes, including pen and ink, scratchboard, wash, and mixed media.

Landscape Architecture
201 Studio: Design Fundamentals
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 2:30-4:25. Required 5-day field trip in 303, R. T. Trancik. Principles of graphic presentation, including the use of media and rendering techniques applicable to specific field problems. Timely urban issues are investigated, including physical design considerations as well as the complex socioeconomic implications of urban design. Site-development problems at several scales and land-use intensities are examined.

202 Studio: Site Planning
Spring. 6 credits. Prerequisite: Landscape Architecture 201 with a grade of C or better. Lab fee, $20; cost of drafting supplies, about $100. Lecs, M W F 2:30-4:25. M. I. Adleman, R. T. Trancik, P. J. Trowbridge. Project planning focusing on the organization of outdoor space, the siting of structures, and the interrelationships of pedestrian circulation, parking, open spaces, earth form, and vegetation.

205 Graphic Communication I
Fall. 3 credits. Prerequisite: concurrent enrollment in Landscape Architecture 201 or Landscape Architecture 501 or permission of instructor. Cost of supplies, about $30. Lecs, T R 9:05-11. P. J. Trowbridge. Principles of graphic presentation, including the use of media and rendering techniques applicable to presentation drawings for landscape architecture projects. Plan graphics, orthographic projections, isometric drawing, one- and two-point perspective as well as sections, elevations, and lettering.

206 Graphic Communication II
Spring. 3 credits. Prerequisite: Landscape Architecture 205. Lecs, T R 9:05-11. R. T. Trancik. A drawing-skills course that relates graphic communication techniques to applications and presentation of space and form. The course will introduce students to advanced graphic expression and delineation, visual ordering systems, and modes of conceptual representation of pattern and volume.

220 Principles of Spatial Design
Fall. 3 credits. Lecs, M W F 9:05. C. F. Gottz and faculty. Planning design principles; functional uses of plants in the landscape ecological, horticultural, and maintenance determinants affecting the selection and use of plant materials, plants, specifications, and procedures involved in plant installation.

301–308 Studio: Regional Landscape Planning
Fall. 1 week–7 credits. 301, weeks 8–14, 3 credits. One or both courses may be taken. Required 1 year of Landscape Architecture 202 with a grade of C or better. Lab fee, $10 per seven-week course; cost of drafting supplies, about $50 per course; expenses for field trip in 301, about $200. Lecs, M W F 1:25; studios, M W F 10:10–12:05. Required 5-day field trip in 301. P. J. Trowbridge. Application of regional landscape planning principles and techniques; management and planning within watersheds, other physiographic units, and politically defined landscapes.

303–304 Studio: Urban Design
Fall. 3 credits. Weeks 1–7, 3 credits. 304, weeks 8–14, 3 credits. One or both courses may be taken. Required 1 year of Landscape Architecture 202 with a grade of C or better. Lab fee, $10 per seven-week course; cost of drafting supplies, about $50 per course; expenses for field trip in 303, about $200. Lecs, M W F 1:25; studios, M W F 2:30–4:25. Required 5-day field trip in 303. R. T. Trancik. Application of town-planning and urban-design techniques to specific field problems. Timely urban issues are investigated, including physical design considerations as well as the complex socioeconomic implications of urban design. Site-development problems at several scales and land-use intensities are examined.

330 Studio: Interdisciplinary Site Planning Process
Spring. 6 credits. Prerequisite: Landscape Architecture 301, 302, 303 or 304 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. Emphasis in this studio includes methods of conceptualizing design and the application of design principles to multidisciplinary professional projects.

310 Site Construction I
Spring. 4 credits. Prerequisite: permission of instructor. Lecs, M W F 9:05. Studi, T R 9:05–11. P. J. Trowbridge Lecures, exercises, and projects dealing with land-form design and the preparation of grading plans, calculation of earthwork, and layout of circulation systems, parking, and site utility systems. Required technical materials are presented in modules with interim testing for competency in the subject area.

311 Site Construction II
Fall. 4 credits. Prerequisite: permission of instructor. Lab fee, $60. Lecs, T R 1:25; studios, T R 2:30–4:25. T. H. Johnson, M. I. Adleman. Construction materials and methods used by landscape architects in project implementation.
Course includes student involvement in demonstration construction, lectures, field trips, studio work on details and models, and construction documentation for a selected design project.

340 Landscape Design
Fall. 4 credits. Limited to 15 students, jointly given to landscape horticulture majors. Prerequisite: permission of instructor. Lab fee, $20.
Lecs, T R 1:25; studios, T R 2:30–4:25.
M. J. Adelmann, T. H. Johnson.
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.

401 Studio: Professional Practice
Fall, weeks 1–7, 3 credits. Prerequisite: Landscape Architecture 306 with a grade of C or better. Lab fee, $10; cost of supplies, about $50; basic expenses for field trip, about $200.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.

403 Studio: Advanced Site Design
Fall, weeks 8–14, 3 credits. Prerequisite: Landscape Architecture 306 with a grade of C or better. Lab fee, $10; cost of supplies, about $50.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.
M. J. Adelmann.
Site design and construction with a particular focus on the principles and process of site grading and the further development of site grading skills.

405 Senior Project Seminar
Fall. 1 credit. Prerequisite: concurrent registration in Landscape Architecture 401–403.
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 Landscape Architecture 403.

406 Studio: Senior Project
Spring, 6 credits. Prerequisite: Landscape Architecture 405 and 401–403 with a grade of C or better. Lab fee, $20; cost of supplies and reproductions, about $200.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.
Inventory, analysis, and design methods applied to approved project designed in Landscape Architecture 405. The senior project represents an evaluation of minimum competency in landscape architecture.

490 Special Topics in Landscape Architecture
Fall or spring, 1–3 credits, may be repeated for credit. S-U grades optional.
Staff.
Topical subjects in landscape architectural design, theory, history, or technology. Group study of topics not considered in other courses.

487 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.

500 Graduate Orientation Seminar
Fall. 1 credit. S-U grades only.
Staff.
Presentation and discussion of work of Cornell faculty in and related to the field of landscape architecture.

501 Studio: Design Fundamentals
Fall. 6 credits. Prerequisite: permission of instructor. 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. T. H. Johnson, L. J. Mirin. An introduction to landscape architectural design approaches, design process, problem solving, and design skills.

502 Studio: 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.
M. J. Adelmann, R. T. Trancik, P. J. Trowbridge. Project planning focusing on the organization of outdoor space, the siting of structures, and the interrelationships of pedestrian circulation, parking, open spaces, earth form, and vegetation.

*520 Contemporary Issues in Landscape Architecture
Fall. 2 credits.
L. J. Mirin.

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

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

*530 Urban Landscape Planning and Design
Spring, 3 credits.
L. J. Mirin.

531 Regional Landscape Planning I
Fall. 3 credits. Prerequisite: permission of instructor.
Lecs, M W F 10:10, A. S. Lieberman. 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 for graduate students in landscape architecture, architecture, city and regional planning, ecology, international studies, international agriculture, and natural resources.

532 Regional Landscape Planning II
Spring. 3 credits. Prerequisite: permission of instructor.
Lecs, M W F 10:10, 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 scale are addressed through review of case studies in North America, Europe, the Middle East, and Australia.

601–602 Studio: Regional Landscape Planning
Fall. 601, weeks 1–7, 3 credits; 602, weeks 8–14, 3 credits. One or both courses may be taken.
Prerequisite: permission of instructor. Lab fee, $10 per week course cost of drafting supplies, about $50 per course; expenses for field trip in 601, about $200.
Lecs, M W F 1:25; studios, M W F 2:30–4:25.
Required 5-day field trip in 601. P. J. Trowbridge. Application of regional landscape planning methods and techniques, management and planning within watersheds, other physiographic units, and politically defined landscapes.

603–604 Studio: Urban Design
Fall. 603, weeks 1–7, 3 credits; 604, weeks 8–14, 3 credits. One or both courses may be taken.
Prerequisite: permission of instructor. Lab fee, $10 per week course cost of drafting supplies, about $50 per course; expenses for field trip in 603, about $200.

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

605 Studio: Defensible Design
Fall. 3 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. Required 5-day field trip in 603. R. T. Trancik. Application of town-planning and urban-design techniques to specific site planning problems. Trendy urban issues are investigated, including physical design considerations as well as the complex socioeconomic implications of urban design. Site-development problems at several scales and land-use intensities are examined.

606 Studio: Interdisciplinary 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. T. H. Johnson. Emphasis in this studio includes methods of conceptualizing design and the application of design principles to multidisciplinary professional projects.

607 Studio: Professional Practice
Fall, weeks 1–7, 3 credits. Prerequisite: permission of instructor. Lab fee, $10; cost of supplies, about $50; basic expenses for field trip, about $200.

609 Studio: Advanced Site Design
Fall, weeks 8–14, 3 credits. Prerequisite: permission of instructor. Lab fee, $10; cost of supplies, about $50.
Site design and construction with a particular focus on the principles and process of site grading and the further development of site grading skills.

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

634 Landscape Architectural Research
Spring, 3 credits.
T R 2–4, T. H. Johnson.
This course will survey research methodologies while focusing on types of prescriptive research used by professional offices and academic departments of landscape architecture. The course will also examine environmental impact statements as a mandated way of asking and answering questions concerning proposed environmental change.

*650 Fieldwork or Workshop 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.

Food Science

100 Introductory Food Science
Fall. 3 credits.
M W F 10:10. N. N. Potter.
A comprehensive introduction to food science and technology—its scope, principles, and practices. Topics are constituent properties, methods of
preservation; the major food groups, including their handling and processing; and current problems such as chemical additives and world feeding needs. Interrelationships between chemical and physical properties, processing, nutrition, and food quality are stressed.

101 Topics in Food Science Fall. 1 credit. Limited to food science majors taking Food Science 100. Prerequisite: Food Science 100. A required companion course to Food Science 100. Lec and disc. F 11:15. N. N. Potter and staff.

Members of the staff lecture and lead discussion on selected topics.

150 Food Choices and Issues Spring. 2 credits S-U grades optional. Lecs. T R 12:20. W. F. Shipe, D. Miller, and staff. Deals with our nutritional needs and the nutrient content of foods. Issues pertaining to diets, food processing, quality, and safety are discussed.

210 Food Analysis Spring. 3 credits. Prerequisite: Chemistry 104 or 208. Lecs. W F 12:20; lab. F 1:25--4:25 or M 7:30--10:30 p.m. J. W. Sherbon.

Designed to acquaint the student with chemical tests used by food analysts in understanding and use of gross analytical techniques, including gravimetric, volumetric, and spectrophotometric methods. Procedures for screening, routine quality control, and official tests for fats, proteins, carbohydrates, and selected minor nutrients are introduced.

220 Food Science for Industry Fall. 2 credits. Lec. and lab. F 12:20--4:25; Field trips. R. C. Baker.

Provides understanding of food industry operations. Hall the laboratories are production of food products (such as sasuries and pastries) by students and half are given to practical plants producing those products. One or two longer field trips may be offered.


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 cereal grains, biology and control of rots, back dys, birds 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. Prerequisite: Nutritional Sciences 115 and organic chemistry or permission of the instructor. M W F 9:05. D. Miller.

An evaluation of the nutritional qualities of raw foods, with an emphasis on changes that occur during processing and storage. Topics include methods and approaches for nutrition evaluation of foods and diets, nutrient stability, nutrient availability, food composition, processing methodology, nutritional significance of selected commodities, food fortification, and food additives.

304 Food Sanitation as Related to Public Health, Food Contaminants, and Quality Assurance Programs Spring. 3 credits. Prerequisite: Food Science 100. Lecs. T R 9:05; lab. R 1:25. R. R. Zall.

Deals with measures essential in producing and processing wholesome and safe foods. Rules and regulations of the Food and Drug Administration, the U.S. Department of Agriculture, and other organizations important to the food industry are covered. Field trips and invited speakers are selected to demonstrate the use of sanitary principles.

311 Milk and Frozen Desserts Fall. 2 credits. Prerequisite: Food Science 322 or permission of instructor. Offered alternate years. Lacs. W 12:20; lab, W 1:25. W. K. Jordan, R. R. Zall. Deals with the principles and practices of processing fluid milk products and frozen desserts. The chemical, microbiological, and technological aspects of processing these dairy products are considered. Field trips to processing plants supplement the lectures and laboratory work.

321 Food Engineering I Fall. 3 credits. Prerequisites: physics and Food Science 100. Lacs. M W 11:15, lab, M 1:25. W. K. Jordan.

Intended to give food science students an understanding of the technology used with poultry, seafood, and other meats and to relate the underlying chemistry, biochemistry, and physiology of muscle to these technologies. Government involvement in these industries will also be discussed.


Deals with the principles and practices of concentration, drying, freezing, and waste management applied to foods. Current processing methods and their relations to the chemistry, microbiology, and technology of raw materials and final products are discussed.

351 Milk Quality Spring. 1 credit. Prerequisite: Animal Science 250 or equivalent or permission of instructor. F 12:20. D. K. Bandler.

Focuses on the important aspects of farm sanitation and milk handling as they affect milk quality and quality. The course involves use of quality control tests, basic microbiology, cleaning and sanitizing, and special problems in manufacturing and marketing fresh and storable dairy products.

394 Food Microbiology Lectures 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 role 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 2:45--2:55. R. A. Ledford. "Work includes study of the physiological characteristics of representative food microorganisms, practice in using general and specific methods of identification, and testing and control of food products, and practice in isolating and characterizing organisms of importance in foods."


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. Not offered 1983--84. Labs, M W 1:25--4:25.

Emphasis is on gaining practical experience in the development of new foods.


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. The making of representative high-energy and protein foods, including soybean milk, tofu, sufu, and tempeh is demonstrated.

406 Food Processing Fermentations Lectures Fall. 3 credits. Prerequisite: background in microbiology. Offered alternate years. Lacs. T R 11:15; disc. R 1:25--4:25. F. V. Koskowiski.

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. Lab. T 1:25--4:25. F. V. Koskowiski.

Laboratory exercises and demonstrations in the making of wines, beers, cheeses, cultured milks, and vegetable foods. A field trip provides additional experience.


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.


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.


Intended for food science majors anticipating product development, production, or quality-control assignments in the food industry. Functional
properties of classes of ingredients and their potential interactions with other food constituents are discussed. Guest lecturers from ingredient suppliers participate.

415 Principles of Food Packaging Fall 3 credits MWF 9:10 J. H. Hotchkiss. The chemical and physical properties and manufacture of the basic material used to construct packaging are discussed. Specific packages currently used for individual food commodity groups are also presented with emphasis on newer technologies. Economics, design, and regulation of food packaging are briefly presented.

416 Food Packaging Laboratory Spring 2 credits. Prerequisite: Food Science 415. Lec. F, 8; lab to be arranged. J. H. Hotchkiss. A laboratory course designed to introduce several testing methods used to evaluate adequacy of food packaging. Emphasis are on physical testing methods of packaging materials and the evaluation of total packages. Mathematical modeling will be employed when appropriate. Students will design and build a new food package.

419 Food Chemistry Laboratory Fall 2 credits. Prerequisites: Biological Sciences 330 or 331 and concurrent registration in Food Science 409. Lab. T 1:25–4:25. D. Miller. Intended to complement Food Science 409 in developing an understanding of the chemistry of food. Laboratory exercises deal with the chemical properties of food components and changes these components undergo in processing and storage. The relationship between the chemical composition of foods and functional, nutritional, and organoleptic properties is stressed.

421 Food Processing II Fall 3 credits. Prerequisite: Food Science 322. Lecs. T R 10:10; lab, F 1:25–4:25. M. A. Rao, S. S. H. Rizvi. 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 fat and oil processing techniques.

422 Food Engineering II Spring 3 credits. Prerequisite: Food Science 421. Lecs. W F 10:10; lab, F 1:25–4:25. M. R. McLellan, S. S. H. Rizvi. Application of thermodynamic principles, mass transport, and related unit operations to food processes. Engineering aspects of food plant operations and automation, with emphasis on future directions. Laboratory includes theoretical computation and a number of experiments on process controls.

497 Special Topics in Food Science Fall or spring. 3 credits. maximum. Prerequisite: permission of instructor. S–U grades optional. Staff. For the food science student. May include individual tutorial study, a special lecture topic selected by a professional in the food industry, 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. Exception 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. Limited to graduate students and to seniors with permission of the instructor. Prerequisite: Food Science 409 or its equivalent. Lec. MWF 10:10 J. M. Regenstein. The chemistry and physical chemistry of proteins are discussed. Important proteins of food systems are examined in terms of methodology currently used in protein chemistry for characterization and purification. Interactions of proteins with other food components are also covered.

603 Food Carbohydrates Spring 2 credits. Limited to qualified seniors and graduate students. Prerequisite: Biological Sciences 330 or equivalent. Offered alternate years. Lecs. T R 10:10; R. S. Shallenberger and staff. 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. Prerequisites: organic chemistry, biochemistry, and knowledge of dairy-product manufacturing procedures. Offered alternate years. Not offered 1983–84. Lecs. T R 12:20; D. M. Barbaro. 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.

606 Instrumental Methods Fall 5 credits. Prerequisite: permission of instructor. Lec. MWF 8; lab, W or R 1:25–4:25. J. W. Sherbon. Deals with instrumental methods widely used in research and industry. Included are chromatography, spectroscopy, electrophoresis, thermal analysis, and the use of computers. The stress is on the theoretical and practical aspects of the material presented.

608 Food Color and Food Pigments Fall. 1 credit. Prerequisite: organic chemistry. Offered alternate years. Lec. F 11:15; J. P. VanBuren. 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. Lec. T 12:20; M. C. Bourne. 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 Toxicology Fall. 2 credits. Prerequisites: biochemistry and animal physiology. Offered alternate years. Lec. T R 11:15; G. S. Stoeszand, J. G. Babieh, D. J. Lisk. An introduction to the concepts and essentials of toxicology; discussions will include sources, modes of toxicity, harmful effects, and remedial measures as they pertain to humans and the whole environment. Toxicants will include pesticides, heavy metals, air pollutants, industrial poisons, natural toxicants, food additives, drugs, social poisons, and ionizing radiation.

614 Mathematical Evaluation of Processed Packaged Foods Spring. 3 credits. Offered alternate years. Not offered 1983–84. Lec. and disc, R 2–4:25. Mathematical methods used to evaluate the thermal processing of packaged foods are presented in depth. These techniques are used in predicting shelf life and nutrient loss.

615 Secondary Plant Metabolites in Foods Fall 1 credit. Prerequisite: Biological Sciences 330 or 331. Offered alternate years. Not offered 1983–84. Lec. F 12:20; G. Hrazdina. Deals with the chemistry and biochemistry of secondary plant metabolites (chlorophyll, lignin, flavonoids, alkaloids, terpenes, flavonoids, steroids, and cyanogenic glycosides) and their importance to food products. Emphasis is on the chemical and biochemical properties of these compounds, their occurrence in edible plants, their reactions, and influence on food products.


Related Courses in Other Departments
Marketing (Agricultural Economics 240)
Food Industry Management (Agricultural Economics 443)
Introduction to Agricultural Engineering and Computing (Agricultural Engineering 151)
Engineering Design and Analysis of Food Processing Equipment (Agricultural Engineering 466)
Meat and Meat Products (Animal Science 290)
Commercial Meat Processing (Animal Science 490)
Advanced General Microbiology Lectures (Microbiology 390)
Postharvest Handling and Marketing of Vegetables (Vegetable Crops 312)

International Agriculture
300 Perspectives in International Agriculture and Rural Development Fall. 2 credits. S–U grades optional. F 1:25–3:20. Staff. 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.

709 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

500 Seminar: International Agriculture Fall and spring. No credit. S–U grades only. Third and fourth W of each month, 4–5. Staff.
The seminar focuses on developing an understanding of the nature and interrelatedness of agricultural development and the social sciences, plant and animal sciences, foods and nutrition, and natural resources.

602 Special Studies of Problems of Agriculture in the Tropics  
Spring. 3 credits. Prerequisites: an international agriculture course and permission of instructors. Cost of field-study trip, estimated at $800 for lodging, meals, personal expenses, and transportation.

R 2:30-4:25. Staff

Oriented to provide students an opportunity to observe agricultural development in a tropical environment and promote interdisciplinary exchange among staff and students. The two-week field-study trip during January to Latin American countries is followed by discussions and assignments dealing with problems in agriculture and livestock production in the context of social and economic conditions.

603 Administration of Agricultural and Rural Development (also Government 692 and Business and Public Administration NCE 514)  

An intercollege course designed to provide graduate students a multidisciplinary perspective on the administration of agricultural and rural development activities in developing countries. The course is oriented to students trained in agricultural and social sciences who are likely to occupy administrative roles during their professional careers.

604 Seminar on African Agriculture and Rural Development  

Strategies for increasing food production and raising rural incomes in Africa. Topics include cropping systems in Africa and the role of agricultural technology in increasing yields and improving livestock production; strategies for improving human nutrition; food storage and mechanization; rural employment projects; alternative rural development strategies, and experience with World Bank and other internationally funded rural development projects.

605 Chinese Agricultural and Rural Development  
Fall. 3 credits. S-U grades optional. T R 12:20–2:15. Staff.

A multidisciplinary seminar dealing with the economic, social, and technical aspects of agricultural modernization in China. The course will explore changing strategies for agricultural and rural development and review the China experience against developmental efforts in other countries.

606 Farming Systems Research  

An interdisciplinary course focusing on the development of agricultural technologies and policies designed to assist small-scale farmers in developing countries. Techniques for gathering information, specifying research problems, and analyzing and interpreting data will be explored. The involvement of farmers in the research process is stressed.

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

A seminar on current themes of agricultural and rural development. Specific content varies each semester.

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

The seminar provides students the opportunity to present their special projects. It also serves as a forum for discussion of current issues in low-income agricultural and rural development, with particular attention to interdisciplinary complexities.

Related Courses in Other Departments

Economics of Agricultural Geography (Agricultural Economics 150)

[Agricultural Trade Policy (Agricultural Economics 430) Not offered 1983–84]

Economics of Agricultural Development

[Agricultural Economics 464]

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

[Macroeconomic Issues In Agricultural Development (Agricultural Economics 663) Not offered 1983–84.]

Microeconomic Issues In Agricultural Development (Agricultural Economics 664)

Seminar on Latin American Agricultural Policy (Agricultural Economics 665)

Seminar in Agricultural Development (Agricultural Economics 666)

[Seminar on Agricultural Trade Policy (Agricultural Economics 730) Not offered 1983–84.]

[Export Marketing (Agricultural Economics 743) Not offered 1983–84.]

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 486)

Livestock Production in Warm Climates (Animal Science 400)

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

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

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

Seminar in Project Planning in Developing Countries (City and Regional Planning 773)

Intercultural Communication (Communication Arts 601)

Communication in the Developing Nations (Communication Arts 624)

Designing Extension and Continuing Education Programs (Education 681)

Community Education (Education 682)

Behavioral Change In International Rural Modernization (Education 782)

Comparative Extension Education (Education 783)

Arthropods of World Importance (Entomology 341)

Postharvest Food Systems (Food Science 247)

[International Food Sciences and Development (Food Science 403) Not offered 1983–84]

Political Economy of Change: Rural Development In the Third World (Government 648)

Regional Landscape Planning I (Landscape Architecture 531)

Regional Landscape Planning II (Landscape Architecture 532)

National and International Food Economics (Nutritional Sciences 457)

International Nutrition Problems, Policy, and Programs (Nutritional Sciences 680)

Seminar In International Nutrition and Development Policy (Nutritional Sciences 695)

Special Topics In International Nutrition (Nutritional Sciences 699)

Plant Diseases in Tropical Agricultural Development (Plant Pathology 655)

Economic Fruits of the World (Pomology 208)

Rural Sociology and World Development Problems (Rural Sociology 105)

[Social Indicators and Data Management in Poor Countries (Rural Sociology 213) Not offered 1983–84]

Rural Development and Cultural Change (Rural Sociology 355)

Subsistence Agriculture In Transition (Rural Sociology 357)

Rural Social Stratification (Rural Sociology 445)

[Contemporary Sociological Theories of Development (Rural Sociology 506) Not offered 1982–83]

Social Organization of Agriculture (Rural Sociology 650)

[Rural Development Information Systems (Rural Sociology 715) Not offered 1983–84]

[Social Movements In Agrarian Society (Rural Sociology 723) Not offered 1983–84]

Sociotechnical Aspects of Irrigation (Rural Sociology 754)

Landscape Architecture

The Landscape Architecture Program at Cornell is sponsored by the College of Agriculture and Life Sciences through the Department of Horticulture and Ornamental Horticulture and the College of Architecture. Art, and Planning. For course descriptions, see p. 58-59.

Microbiology


290 General Microbiology Lectures  
Fall, spring, or summer. 3 credits. Prerequisites. Biological Sciences 101–102 and 103–104 and Chemistry 104

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, spring, or summer 2 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. Ghirose; spring, P. J. VanDemark. A study of the basic principles and techniques of laboratory practice in microbiology, and fundamentals necessary for further work in the subject.

292 General Microbiology Discussion Spring 1 credit. Prerequisite: Microbiology 290 (may be taken concurrently). S-U grades only. Hours to be arranged. P. J. VanDemark. A series of discussion groups in specialized areas of microbiology to complement Microbiology 290.

314 Tissue Culture Techniques and Applications Fall 2 credits. Prerequisites: Microbiology 290 and 291 or permission of instructor. F 1:25-3:30; 3 lab exercises scheduled on a rotating basis, F 3:30-5:30. C. M. Rehugler. A series of lectures and demonstrations dealing with cell culture methods, especially those required to culture cells of plants and animals from different tissue origins. The application of cell culture to the study of bacterial diseases, virus replication, and the production of biologicals is considered.


390 Advanced General Microbiology Lectures Spring 2 credits. Prerequisites: Microbiology 290 and 291 and organic chemistry. May be taken independently of Microbiology 391. M W 11:15. S. H. Zinder. A consideration of the physiology, morphology, genetics, culture, and taxonomy of important groups of bacteria.

391 Advanced General Microbiology Laboratory Spring 2 credits. Prerequisites: Microbiology 390 (may be taken concurrently) and permission of instructor. Not offered 1983–84. M W 2-4:25. S. H. Zinder. Intended as a laboratory complementing Microbiology 390. The isolation, characterization, and study of bacteria included in Microbiology 390.]

412-413 Clinical Microbiology 412 fall; 413 spring. Credits 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 466, and organic chemistry. T R 10:10-11:25. N. C. Dondoro.

A consideration of the relation of microorganisms, especially the bacteria, to aquatic environments, both natural and artificial. The microbiology of wastewater 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: an elementary course in some facet of microbiology. Offered alternate years. Not offered 1983–84. M W F 10:10. M. Alexander. 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 Laboratory Spring 3 credits. Prerequisites: Microbiology 290 and 291 and biochemistry. S-U grades optional. M W F 11:15. R. P. Mortlock. 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. Prerequisites: Microbiology 460 (may be taken concurrently) and permission of instructor. S-U grades optional. T R 12:20-4:25. R. P. 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. Ghirose. Cytology of prokaryotes, techniques, including preparations for light and electron microscopy, that are especially 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. T R 11:15. E. A. Delwiche. Selected topics pertaining to the energy metabolism, oxidative and fermentative abilities, and biosynthetic capacities of microorganisms. Where possible and appropriate, the subject matter compares the various microbial forms.

497 Special Topics Fall. 1 credit. Limited to upperclass students specializing in microbiology who may desire to take Microbiology 499. Prerequisite: permission of instructor. S-U grades only. The course cannot be used to fulfill the specialization requirement. Hours to be arranged. Staff.

498 Teaching Experience Fall or spring. 1–3 credits. Enrollment limited. Prerequisites: previous enrollment in the course to be taught or equivalent, and written permission of instructor. S-U grades with permission of instructor. Hours to be arranged. Staff.

Designed to give qualified undergraduate students teaching experience through actual involvement in planning and teaching microbiology courses under supervision of departmental faculty. This experience may include leading a discussion group; preparing, assisting, or teaching a microbiology laboratory; or tutoring. Microbiology courses currently offering such experience include 291 and 292. This course cannot be used to fulfill the specialization requirement.

499 Research in Microbiology Fall or spring. Variable credit. Undergraduates must attach to their course enrollment material written permission of the staff member who will supervise the work and assign the grade. This course cannot be used to fulfill the specialization requirement. Hours to be arranged. Staff.

691 Graduate Seminar in Microbiology Fall and spring. 1 credit each semester. Required of all graduate students in the graduate field of microbiology. A seminar for graduate students who have completed the Microbiology 691 series requirement are required to present a seminar concerning their research interests and activities at least once each year. S-U grades only. Hours to be arranged. Staff.

692 Pathogenic Microbiology Fall and spring. 1 credit each semester. Required of all undergraduate microbiology majors. Limitation of 48 students. Prerequisites: Microbiology 290, 291, and Veterinary Medicine 316, also Biological Sciences 307.

791 Graduate Research Seminar in Microbiology Fall and spring. 4 credits. Prerequisites: either Microbiology 390, 392, or 480, and Biological Sciences 330 or 331 or equivalent. M W 12:20-4:25. E. P. Greenberg. Physiology, ecology, and morphology of selected groups of bacteria, including the methanogenic bacteria, spirochetes, myxobacteria, photosynthetic bacteria, thermophilic bacteria, myxobacteria, and others. Behavior of bacteria in response to environmental stimuli.

699 Microbiology Seminar Fall and spring. 1 credit each semester. Required of all graduate students majoring in microbiology and open to all who are interested. Hours to be arranged. Staff.

791 Graduate Research Seminar in Microbiology Fall and spring. 1 credit each semester. Required of all undergraduate microbiology majors. Limitation of 48 students. Prerequisites: Microbiology 290, 291, and Veterinary Medicine 316, also Biological Sciences 307.

801 Graduate 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 801 series requirement are required to present a seminar concerning their research interests and activities at least once each year. S-U grades only. Hours to be arranged. Staff.

Related Courses in Other Departments

Soil Microbiology (Agronomy 406)

Advanced Soil Microbiology (Agronomy 506)

Insect Pathology (Entomology 453)

Food Microbiology Lectures (Food Science 394)

Food Microbiology Laboratory (Food Science 395)

Food Mycology (Food Science 411)

Basic Immunology, Lectures (Veterinary Medicine 315, also Biological Sciences 305)

Basic Immunology, Laboratory (Veterinary Medicine 316, also Biological Sciences 307)

Pathogenic Microbiology (Veterinary Medicine 317) Spring 4 credits. Primarily for graduate and undergraduate microbiology majors. Limitation of 48 students. Prerequisites: Microbiology 290, 291, and Veterinary Medicine 315, or permission of instructor. Recommended: Veterinary Medicine 316. Lec., T R 1:05; lab, T R 2:05-4:25. G. M. Dunny, J. H. Gillespie, K. M. Lee.

Two-part course in medical microbiology, covering bacterial and yeast diseases. Consideration is given to the antibiotic resistance of pathogenic microorganisms.
Environmental concerns are introduced. Social, political, legal, economic, and ethical aspects of pollution, disposal of radioactive wastes, human and ecological problems related to their management and use, and the interaction of students with biological events in the field and accurate recording of these events are emphasized.

250 Introductory Wildlife Biology

Spring, first third of term. 1 credit. Prerequisite: Natural Resources 210 or permission of instructor. Lecs, M W F 8 A. N. Moen. Introduction to the biological characteristics of wildlife species, with emphasis on field techniques in an ecological setting. Importance of basic life history, ecology, and measurable parameters as a basis for fishery management. Representative commercial and recreational fisheries will be used as examples.

252 Introductory Forestry

Spring, last third of term. 1 credit. Prerequisite: Natural Resources 210 or permission of instructor. Lecs, M W F 8; field trip, all day on one S. T. Fahey. Introduction to the biological characteristics of forest ecosystems. All laboratory sessions in the field. Importance of basic life history, ecology, and measurable parameters as a basis for forest management. Introduction to tree biology and silviculture.

260 Introduction to Consumptive Wildlife Recreation

Fall, 2 credits. Limited to 30 students. Prerequisites: natural resources majors or permission of instructor. Lecs, M W F 8; field trip, all day on one S. T. Fahey. Important emphasis on current literature. The course will involve working with and understanding parasites and their control. The course will involve an in-depth treatment of research techniques unique to working with and understanding parasites.

200 Principles of Conservation

Fall, 3 credits. Limited to natural resources majors. Not open to students who have passed Natural Resources 201. Lecs, M W F 10:10-12:10; 1-hour disc to be arranged. R. J. McNeil. Principles of environmental conservation and application of those principles to the management of natural resources. Ecological concepts, a survey of the natural resources and their properties, and resource management concepts are considered.

201 Environmental Conservation

Spring, 3 credits. Not open to students who have passed Natural Resources 200. Lecs, M W F 10:10-12:10; 1-hour disc to be arranged. R. J. McNeil. A survey course intended for students in any year and major. People, natural resources, and environment. Ecological principles as applied to human use of environment; survival strategies of animals and the application of these concepts to human use and misuse of environment; a survey of natural resources and problems related to their management; and current issues such as air and water pollution, disposal of radioactive wastes, human population pressures, energy supply and management, and life-style are considered. Social, political, legal, economic, and ethical aspects of environmental concerns are introduced.

302 Forest Ecology

Fall, 3 credits. Cost of trip, no more than $20. Lecs, M W F 11:15-12:45; lab, M 12:20-4:25; 1 weekend trip through S. T. Fahey. Analysis of field structure, and dynamics of forest ecosystems. All laboratory sessions in the field. One weekend field trip to the Adirondacks or other forest region.

305 Maple Sap Production

Spring, 1 credit. Prerequisite: permission of instructor. S-U grades only. T 12:20-4:25 (3 preliminary seminars, followed by several half-days of fieldwork during the maple season). J. Kelley, A. Fontana. Students work in most phases of the Arnot Forest maple operation and learn modern sap collection techniques and quality control in making syrup. A 100-tal area is reserved for student installation of a tubing sap collection network.

320 Winter Energetics

Spring, 1 credit. Prerequisite: Natural Resources 250. Lecs, lab, and disc, all day on M T W R F in residence at Arnot Forest. A. N. Moen. Field measurements of weather and range conditions in the winter will be related to metabolism, nutrition, and behavior of free-ranging animals at the Arnot Forest during the last week of the January intersession period.

321 Field Ornithology

Summer (fall credit can be arranged). 1 credit. Enrollment limited. Prerequisite: permission of instructor. Recommended: Natural Resources 210 and Biological Sciences 360. Lecs, lab, and disc, all day on M T W R F in residence at Arnot Forest. C. Smith. Emphasis will be placed upon methods of field identification of birds by sight and sound and the use of those skills in the estimation of abundance and analysis of avian community structure. Field exercises will involve students in the collection and evaluation of field data relevant to studies of songbird populations and community structure in a management context. Introductory Field Ecology (Natural Resources 210) and General Biology (Biological Sciences 360) are desirable prerequisites. This course should be considered complementary to a one-semester course in ornithology and will not substitute for such a course. The course is held at the Arnot Forest during the three-week summer session beginning the week after Commencement.

330 Ecological Integration

Summer or fall. 4 credits. Prerequisite: Natural Resources 250 or permission of instructor. Lecs, lab, and field sessions, all day M T W R F in residence at the Arnot Forest. R. A. Howard. Capture, handling, marking, and field identification techniques for small mammals will be emphasized. Exercises in home range analysis and population estimation with both recapture and removal sampling will supplement natural history discussions. Community structure and habitat interactions will also be stressed. Students will complete an independent survey of small mammals in a limited area of the forest. This course is held during the three-week summer session at the Arnot Forest in early June.

360 Earth Resources Inventories (also Agronomy 360)

Spring, 3 credits. Lecs, M W 12:20; lab, M T 2 E. E. Hardy. Procedures for inventorying resources, the methods used, and theories of development in relation to present needs. Examination of the processes used in generating currently used inventories, application of methods to improve existing inventories, and experience in developing inventories. Land resource inventories are emphasized.

406 Conducting Marine and Natural Resources Extension Programs

Spring. 3 credits. Lecs and rec. Time and days to be arranged. One weekend field trip. B. T. Wilkins. 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 only. T R 9:05. 1-hour disc to be arranged. R. A. Baer. A study of the effects of Western religion and values on our understanding and treatment of nature.

410 Principles of Wildlife Management
Fall. 4 credits. Limited to 36 students. Preference given to seniors in natural resources. Prerequisites: Natural Resources 210 and Biological Sciences 360, or permission of instructor. Cost of field trips, no more than $20.

411 Techniques in Wildlife Science
Spring. 2 credits. Prerequisite: Natural Resources 410 or permission of instructor. Lec, F 12:20; lab, F 1:25-4:25. J. W. Caslick. Stresses the application of ecological, behavioral, and genetic principles to management of wild vertebrate populations. Encourages student development of a theoretical-biological framework on which to base management decisions. Provides students with a sense of the history of wildlife management in North America and a feeling for its future.

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. Offered alternate years. T R 1:25-4:25. Several field trips usually taken weekdays, one overnight field trip to Albany. H. B. Brumsted.

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.

420 Dynamics of Animal Populations
Spring. 2 credits. For seniors and graduate students in natural resources, others by permission of instructor. Offered alternate years. T R 10:10. W. D. Youngs. A quantitative examination of the dynamics of animal populations. Interactive computing is used to assist in analysis and understanding of population models. Principles and problems involved in the management of freshwater and marine fishery resources, considered in relation to problems of human population and management of other natural resources.

448 Fishery Science
Fall. 3 credits. For seniors majoring in fishery science; others by permission of instructor. Prerequisites: a year of statistics and calculus. Offered alternate years. M W F 12:20. W. Y. Youngs.

449 Managing the Aquatic Environment
Fall. 2 credits. Limited to 30 juniors and seniors not majoring in aquatic science. Lec, T R 9:05. R. T. Oglesby. The nature of aquatic environments and effects of humans on them are initial topics. Wise use of aquatic resources is surveyed in terms of human impacts on them, including the introduction of toxicants and nutrients, removal or addition of particular biotic components, and modifications of the physical environment. Emphasis is on lakes, rivers, and estuaries. A case history approach is used.

490 Practicum in Natural Resources Analysis and Planning
Fall. 5 credits. For seniors in natural resources; others by permission of instructors. Hours to be arranged. Staff.

492 (498) Research in Resource Analysis and Planning
Fall or spring. Credit to be arranged. Prerequisite: permission of instructor. S-U grades optional. R. A. Baer, H. B. Brumsted, E. E. Hardy, T. L. Hullar, J. W. Kelley, R. J. McNelis, B. T. Wilkins.

495 Research in Wildlife Science

496 Research in Forestry
Fall or spring. Credit to be arranged. S-U grades optional. Hours to be arranged. J. L. Forney, S. P. Gloss, R. T. Oglesby, C. L. Schofield, D. A. Webster, W. D. Youngs.

500 Professional Projects—M.P.S.
Fall and spring. Credit to be arranged. Limited to graduate students working on professional master's projects. S-U grades only. Staff.

501 Seminar on Selected Topics in Fishery Biology
Fall or spring. 1 credit. Hours to be arranged. Staff.

502 Seminar in Natural Resources Analysis for Ecologically Based Planning
Spring. 2 credits. S-U grades only. M 2:30. T. J. Fahey. Multidisciplinary graduate seminar. Theme changes each year but usually involves a case study of a specific area of land and water with which the student is usually required. Engineers, economists, sociologists, soil scientists, foresters, planners, and wildlife and fishery biologists are invited to bring expertise to the planning table.

503 Habitat Ecology
Spring. 2 or 3 credits. Limited to 12 seniors and graduate students majoring in natural resources or by permission. Prerequisite: permission of instructor. Cost of field trips, no more than $20. W 12:20–3. M. E. Richmond.

506 Marine Resources Policies
Spring. 2 credits. Prerequisite: at least one related course such as Biological Sciences 264, 665, or 668; Natural Resources 436, or permission of instructor. S-U grades optional. Offered alternate years. Lec, T 9:05; disc, T 1:25–3:25; at least 1 S field exercise. R. T. Oglesby. Lectures and readings focus on issues and problems of management of marine resources. Emphasis is on policies for preservation and use, and methods and strategies of management to minimize undesirable aspects of marine activities.

507 Ecological Systems Analysis
Spring. 4 credits. Prerequisite: at least one related course such as Biological Sciences 364, 666, or 688; Natural Resources 436, or permission of instructor. S-U grades optional. Offered alternate years. R 1:30–3:30. B. T. Wilkins.

601 Seminar on Selected Topics in Resource Policy and Planning
Fall. 1 credit. S-U grades only. Limited to 12 seniors and graduate students majoring in natural resources or by permission. Primarily for graduate students majoring in resource policy and planning.

602 Seminar in Natural Resources Analysis for Ecologically Based Planning
Spring. 2 credits. S-U grades only. M 2:30. T. J. Fahey. Multidisciplinary graduate seminar. Theme changes each year but usually involves a case study of a specific area of land and water with which the student is usually required. Engineers, economists, sociologists, soil scientists, foresters, planners, and wildlife and fishery biologists are invited to bring expertise to the planning table.

603 Seminar on Selected Topics in Resource Policy and Planning
Fall. 1 credit. S-U grades only. Limited to 12 seniors and graduate students majoring in natural resources or by permission. Cost of field trips, no more than $20. W 12:20–3. M. E. Richmond.

604 Seminar on Selected Topics in Resource Policy and Planning
Fall. 1 credit. S-U grades only. Limited to 12 seniors and graduate students majoring in natural resources or by permission. Cost of field trips, no more than $20. W 12:20–3. M. E. Richmond.

605 Ecology and Management of Disturbed Aquatic Systems (also Toxicology 605)
Spring. 3 credits. Limited to 20 seniors and graduate students. Recommended for students specializing in the aquatic sciences. Prerequisite: Limnology or oceanography. Offered alternate years. Lec, T 9:05; disc, T 1:25–3:25; at least 1 S field exercise. R. T. Oglesby. Lectures and readings focus on issues and problems of management of aquatic ecosystems and on the significance of such interactions. Methods and strategies of management are considered. Detailed case studies are studied and discussed.

606 Marine Resources Policies
Spring. 2 credits. Prerequisite: at least one related course such as Biological Sciences 264, 665, or 668; Natural Resources 436, or permission of instructor. S-U grades optional. Offered alternate years. R 1:30–3:30. B. T. Wilkins.

607 Aquatic Resources Analysis
Spring. 2 credits. Prerequisite: at least one related course such as Biological Sciences 264, 665, or 668; Natural Resources 436, or permission of instructor. S-U grades optional. Offered alternate years. R 1:30–3:30. B. T. Wilkins.

608 Policies and Management of Natural and Wild Lands
Fall. 3 credits. For seniors and graduate students. Prerequisite: permission of instructor. S-U grades optional. Lec, T R 9:05, 1-hour disc to be arranged. T. L. Hullar. Lectures, discussions, special seminars, readings, and case studies on natural and wild lands, particularly those in public ownership. Major topics include the values of the lands, social and scientific basis for their establishment, analysis of the policies for preservation and use, and methods and strategies for management. National and state wilderness systems, social and biological carrying capacity, and effects of special interests and current issues are covered. An independent study of a selected area is required.

609 Effects of Ecological Perturbations on Fishes (also Toxicology 609)
Spring. 3 credits. Prerequisite: Biological Sciences 470 or permission of instructor. Cost of field trips, no more than $15. Lec, T R 9:05; lab, W 1:25–4:25; several field trips. S. P. Gloss.
Impacts of habitat alteration and physical-chemical pollutants, with emphasis on freshwater and diadromous fish species of North America. Direct and indirect effects of a variety of industrial and land-use practices on fish and other aquatic organisms with resultant changes in structure and function of fish communities due to lethal and sublethal responses are discussed. Laboratory includes several field trips.

610 Conservation Seminar Fall and spring. No credit. All graduate students in natural resources are expected to participate. Hours to be arranged. Staff.

611 Seminar in Environmental Ethics Spring. 3 credits. For graduate students, juniors, and seniors. S-U grades optional. Cost of weekend trip, no more than $15. W 1:25–3:30; two or three extra class sessions for presentations of papers and projects. Weekend trip to be arranged. R. A. Baer. How the humanities, particularly religion, philosophy, and ethics, contribute to our understanding of the environment. In successive years, topics will include (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. Staff. Discussion of individual research or current problems in wildlife science.

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.

622 Plant Genetics Spring 4 credits. Prerequisite: one year introductory biology or permission of instructor. Limited to 50 students. Lecs., M W F 9:05; lab., W or R 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.

601 Plant Cell and Tissue Culture Spring 2 credits. Prerequisite: a course in plant physiology, cell biology, or genetics, or permission of instructor. Lecs., T R 10:10, E. D. Earle. Lectures and demonstrations dealing with the techniques of plant tissue culture, cell protoplast, embryos, and anther culture and the applications of these techniques to biological and agricultural studies. Current and proposed methods for plant improvement via manipulations of cultured cells will be discussed.

603 Methods of Plant Breeding Fall 4 credits. Primarily for graduate students but open to qualified seniors who express interest in engaging in plant breeding. Prerequisites: Biological Sciences 101–102, Biological Sciences 261 or Plant Breeding 225, or equivalent, and field crops, vegetable crops. R. L. Shelp, W. R. Rankin, R. R. Sanney. Breeding systems for producing commercial crop varieties are considered in detail. Laboratories include 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.

605 Physiological Genetics of Crop Plants Spring 3 credits. Prerequisites: either genetics, biochemistry, and plant physiology, or permission of instructor. T R B–10, D. H. Wallace. Both genetic and environmental influences on biochemical and molecular control of plant variation in physiological phenomena like 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.

608 Biochemical Analyses in Crop Science Fall 3 credits. Limited enrollment. Prerequisite: Biochemistry 330 or permission of instructor. S-U grades optional. Students must enroll in this course by Aug. 27. Lab., Lecs., M W 1:25–5 (some lab sessions will run longer). P. Y. Bouthyette, P. Gregory. Acquaints the student with specialized biochemical analyses commonly used in breeding programs and related aspects of crop science. Nutrients and toxicants of several crops are studied. Importance of developing an ability to critically assess the biochemical analysis is emphasized.

612 Experimental Methods Spring 2 credits. Prerequisite: Plant Breeding 601 or permission of instructor. Offered alternate years. M W F 12:20, C. C. Lowe. The use of statistical methods and the application of experimental designs and plot techniques to problems in plant breeding and related agricultural research.

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. R 1:25–4:30, 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.

716 Perspectives In Plant Breeding Strategies Spring. 2 credits. S-U grades optional. Prerequisite: Plant Breeding 603. R 12:20–2:15, 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.


718 Genetics and Breeding for Disease and Insect Resistance Fall, 1st week of semester. 1 credit. Prerequisite: Plant Breeding 603. S-U grades only. T R 10:10, 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.

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. Lecs., T R 11:15, lab., T M W F R 2–4:25 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 that govern 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, chemical and biological control.
309 Introductory Mycology Fall 4 credits.
Prerequisites: a year of botany or equivalent and permission of instructor.
Required field trips. R. P. Kor.
An introduction to fungi, emphasizing comparative morphology and biology.

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. Ameson.
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: either Plant Pathology 301 and Entomology 241 or equivalent.
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.
An opportunity for independent study of a special topic in mycology or plant pathology under the direction of a faculty member.

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 discussions 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. Ameson, 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. Kor.
Ascomycetes (excluding Discomycetes).
651 Diseases of Fruit Crops Autotutorial slide and tape sets. P. A. Ameson.
For graduate students and advanced undergraduates with a particular interest in fruit. Covers the economic importance, causal agents, symptoms, disease cycle, and control measures for the major diseases of fruit in the Northeast.
653 Dendropathology G. W. Hudler, W. A. Sinclair.
654 Diseases of Florist Crops R. K. Horst.
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 399 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 pathobiology in terms of the nature of disease, etiology, stages in pathogenesis, epidemiology, and pest management. Laboratories involve exercises illustrating concepts, discussions, in-class and laboratory topics.

711 Biology of Plant Pathogens Fall. 4 credits.
Limited to graduate students with a major or minor in plant pathology. Prerequisite: Plant Pathology 701 or equivalent with permission of instructor.
Lecs, T R 11:15; lab, T 2–4:25. S. V. Beer 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. Not offered 1983–85.
Lecs (2); lab (1). M. Zaitlin.
Topics in plant virology, with an emphasis on student participation in discussion of current literature. Topics include viruses, virus structure, viral and viral 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, protoplast, 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.
Anatomy, morphology, and taxonomy of plant parasitic forms and nonparasitic soil-inhibiting forms of nematodes are studied. Plant pathogenic forms are also considered from the standpoint of host-pathogen relationships, host ranges, life cycles, and the symptoms they cause. Principles and methods of control are discussed.

737 Bacterial Plant Pathogens Spring. 3 credits.
For graduate students with a major or minor in plant pathology. Prerequisites: Plant Pathology 701 and 711 or permission of instructor. Offered alternate years. Not offered 1983–84.
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 major in plant pathology. Prerequisites: advanced interest in molecular mechanisms of pathogenesis. Prerequisite: permission of instructor. Offered alternate years.
Hours to be arranged. H. D. VanEtten, O. C. Yoder, and staff.
This course deals with the molecular properties of both microorganisms and higher plants that control the development of host-parasite relationships. Contemporary molecular hypotheses are related to genetic mechanisms of pathogenesis. Emphasis is placed on a critical evaluation of the data that are used to support each specific hypothesis.

739 Advanced Mycology Fall. 4 credits.
Prerequisites: Plant Pathology 309 or equivalent, a course in genetics, and permission of instructor. Offered alternate years. Not offered 1983–84 nor 1984–85.
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. Kor.
A detailed study of the taxonomy and biology of the 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. Hanson, B. B. Brodie.

759 Taxonomy of Fungi Fall. 4 credits.
Prerequisites: Plant Pathology 309 or equivalent, genetics, plant or animal taxonomy, and permission of instructor. Offered alternate years. Not offered 1983–84.
Lecs, M 10:10; labs, M W 1:25–4:25; required field trips. R. P. Kor.
Emphasis is on the principles of taxonomy, critical evaluation of keys and monographs, and practice in identification. The Diacmycetes are treated in detail.

797 Special Topics Fall or spring. 1–5 credits. S-U grades optional.
Half of the time to be arranged. Staff.
An opportunity for independent study of a special topic.

799 Graduate Research Fall or spring. 1–5 credits. S-U grades optional.
Hours to be arranged. Staff.

Pomology


100 Introductory Pomology Fall or spring. 3 credits.
S-U grades only for graduate students.
A study of the general principles and practices of fruit culture and their relation to the underlying sciences. Included are tree fruits, grapes, small fruits, and nuts. 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 F 9:10; lab. F 2:45-4:15. E. W. Liu

The important sub tropical and tropical fruits such as citrus, banana, pineapple, mango, coffee, and cacao are considered. Morphology, physiology, and adaptation to climate are stressed rather than details of culture. A broad view of world pomology is given.

302 Fruit-Tree Nursery Operation Spring, first 4½ weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. S-U grades optional. Offered alternate years.

Lecs. M W 9:05; lab. M 2:45-4:25. J. N. Cummins

This course is intended to familiarize the fruit producer with the operations and problems of the fruit-tree nursery operator. 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. Lecs. M W 8; lab. R 1:25-4:25. L. E. Powell, W. C. Sites.

A treatment of problems of concern to fruit growers such as site selection, planting and pruning systems, water relations, cold hardiness, dormancy, flowering, and fruiting. Physiological and practical aspects are emphasized.

305 Orchard Management II Fall. 3 credits. Prerequisite: Pomology 100. Recommended: Pomology 304.


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 Fruits1 Spring, last 9 weeks. 2 credits. Prerequisite: Pomology 100 or permission of instructor. Offered alternate years.

Lecs. M W 9:05; lab. M 2:45-4:25. J. P. Tomkins

A study of the general principles and practices in the commercial culture of strawberries, brambles, blueberries, currants, gooseberries, elderberries, and cranberries.

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

Lecs. T R 9:05; lab. T 2:45-4:25. R. M. Pool

Viticulture, with emphasis on the viticulture of the Great Lakes region, as a series of interrelated decisions on varieties, sites, vine management, and vine protection is presented. Those decisions are based on ampelography, meteorology, soils, vine and grape anatomy and physiology, as well as protection of the vine and grapes from injuries, primarily diseases and insects.

310 Postharvest Physiology and Storage of Fruits and Vegetables Fall. 3 credits. Prerequisite: a course in pomology, vegetable crops, or permission of instructor.

Lecs. M W 9:05; lab. F 2:45-4:15. F. W. Liu

The chemistry and physiology of fruits and vegetables as they affect quality and marketability are studied. Maturity indices, handling methods, and storage practices are considered. Practical work includes observations of the effect of handling and storage methods on quality and condition of fruits and vegetables.

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 1983–84; next offered 1984–85.

Lecs. T R 9:05; lab. T 2:45-4:25. 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 1983–84; next offered 1984–85.

Lecs. T R 9:05; lab. T 2:45-4:25. F. W. Liu

A consideration of the fate after processing of fruits produced for consumption. The coverage of fruit products is generally limited to those commercially grown and processed in New York State. Although the discussion includes methods of canning, freezing, dehydration, and other types of processing, emphasis is on the quality requirement and proper handling of raw materials and how they affect the quality of end products.

315 Fruit Variety Improvement Fall, last 4½ weeks. 1 credit. Prerequisite: Pomology 100 or permission of instructor. S-U grades optional. Offered alternate years.

Lecs. T R 9:05; lab. T 2:45-4:25. R. D. Way

The techniques and limitations of producing new varieties of perennial fruit crops are considered.

400 Undergraduate Seminar Spring 1 credit (may be taken twice for credit). Prerequisite: a course in pomology, S-U grades only.

Hours to be arranged. Staff Seminar topics and speakers selected and arranged by the students on subject areas related to pomology.

402 Special Topics in Experimental Pomology Spring. 2 credits. Prerequisite: introductory plant physiology. Offered alternate years.

T R 9:05. L. E. 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 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 theses a written permission application and statement of what the thesis will cover. Staff

700 Graduate Seminar Fall. 1 credit. S-U grades only.

Hours to be arranged. Staff Reports by students on current research or literature in experimental pomology or related areas.

710 Teaching Experience Fall or spring. 1 credit. S-U grades only.

Hours to be arranged. Staff

Developed 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.

100 Introduction to Sociology Fall. 3 credits. Lecs. T R 9:05-10:15, M W 10, 11, 12:20, 1:25, or 2:30. C. C. Geisler and staff.

An examination of the theories, concepts, and methods of sociology as they apply to sociology in general. Major topics include the origins of the discipline, its major theoretical and methodological currents, and its application to contemporary questions of power and bureaucracy, social and cultural change, materialism and sociobiology, social class, and community institutions. S Soc 100 is formally equivalent to 101 (offered in the spring), though less emphasis is placed on rural society and its problems.

101 Introduction to Rural Society in America Spring. 3 credits. Lecs. T R 10-11:15, M W 9:05; F 9:05, 10:10, 11, 12:20, 1:25, or 2:30. H. R. Capener and staff.

An organizing theme will be the interactive relationships between a hypothetical agricultural system and the natural and social sciences and the social system basic to the social sciences. From sociological and historical perspectives this survey course will study the structure and function of rural society in America from its unique settlement patterns to the present. Alternative strategies for monitoring and mediating major changes of an environmental, social, or technological nature will be explored.

104 Proseminar: Issues and Problems in Rural Society Fall. 1 credit. S-U grades only.

R 12:20–1:25. Staff

Intended for the student to subject matter of concern to both applied and academic rural sociologists. Focuses on such subjects as migrant workers, agrabusiness, rural poverty, rural to urban migration, rural development, agricultural research and people, community development, small farmers in the less-developed nations. These topics are explored through the use of films and group discussion.


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 competing theories, in order that 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 relationship of the growth, hunger, and employment; multinational corporations; social movements and social control.

175 Issues in Contemporary Native American Societies (also Anthropology 175) Spring; summer, 6-week session. 3 credits. Spring. M W F 11:15. R. Fournier.

Native American people are confronted with a myriad of special circumstances that impinge upon their everyday lives. The purpose of this course is to present background to these issues and give perspective from a Native American point of view. Early history and the postcontact period will be reviewed with an emphasis given to recent developments (1923–present). Topics such as land claims, treaties, education, mineral and water rights, social problems, Indian organizations, and civil rights will be covered, with guest lecturers and media presentations giving added impact.

[213 Social Indicators and Data Management in Poor Countries Spring. Spring. 3 credits. Not offered 1983–84.]

M W F 11:15. F. W. Young.

A survey of contemporary measures of welfare and social structure. General principles of social-indicator research will be illustrated from data on Tunisia, Kenya, Mexico, etc., in the areas of poverty and level of living, 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 small sample techniques. One-third of the course will be devoted to exercises in data management, using SPSS and microcomputers.

242 American Indian Philosophies I (also Anthropology 242) Fall. 3 credits. T R 2:30–3:45. S. Saraydar.

This course is designed to facilitate an understanding of the worldviews, religious systems, and environmental principles of the present-day cultures of the American Indian peoples. It is suggested that students attend the annual Native American Heritage Month celebration and/or the annual Native American Powwow that are held at the University of Virginia. The course will cover the major worldviews of the American Indian peoples, their impact on their social and political systems, and their role in the development of the United States.

299 Woman and Development in the Third World: A Sociological Approach (also Sociology 299 and Women's Studies 299) Summer. 6-week session. 3 credits.


This course will examine the impact of development and modernization on the status and roles of women in the Third World. Theories of development and sexual stratification and assumptions guiding research and development policies will be discussed and evaluated. Students will gain an understanding of the nature and significance of female activities and the extent of female authority within the contexts of social, class, and religious institutions. The course will focus on Latin America, there will be opportunities for cross-regional comparisons.

324 Social Organization and the Environment Spring. 3 credits. M W F 9:05. Staff.

A discussion of principles involved in our interaction with our environment, viewed from a human ecosystem and ecosystem perspective. Emphasis is given to the function of social organization in human-environment exchanges. Principles are illustrated by referring to both developing and developed societies. The course provides a conceptual framework for understanding and addressing recurring environmental issues.


356 Rural Society in America Fall. Fall. 3 credits. S-U grades only. M W F 9:05. H. Capener. The focus is on gaining a greater understanding of, and appreciation for, the rural sector of American society. From sociological and historical perspectives, the nature of changes in rural society are examined, including the impact of technology on agriculture, other extractive industries, natural resources, the environment, regional variation, the urban-rural dominance theme, comparative life-styles, cultural orientations, value patterns, and a look to the future.

357 Subsistence Agriculture in Transition Spring. 3 credits. Lecs, T R 10:10–12:10. disc, T or R 11:15. M. L. Barnett. An analysis of selected types of peasant communities, definitions of subsistence, the environmental and social conditions. Social structure, systems of farming and land-tenure arrangements, and motivational characteristics of subsistence farmers in the context of subsistence and the relationship of production to consumption.

360 The Older Order Amish: Folk Society or Model for the Future? Summer. 3-week session. 3 credits. M T W R 9–11:30. M. Olshan.

The relevance of Amish practices and attitudes to such issues as control of population, appropriate technology, and governmental influence. Examination of the paradox of Amish freedom from American institutions in which a highly regimented subculture. Theoretical and policy implications of current court decisions which both legitimize and challenge Amish separation from United States society.

367 American Indian Tribal Governments (also Anthropology 367) Fall. 3 credits. W 7:30–9:55 p.m. S. Saraydar.

This course focuses on the structure of contemporary tribal governments and the effects of these governments on the lives of the American Indians. The effects of European contact on traditional political organizations are discussed, 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 P. Garrett, departmental honors committee representative.


An advanced undergraduate seminar for senior majors in rural sociology and the sociology of community development. The course focuses on (1) the central concepts of the sociological tradition; (2) major classical theorists (Max Weber, Durkheim, Tocqueville) and contemporary counterparts; (3) application of the classical ideas in contemporary research.
463 Industrialization as an Instrument for the Development of Rural Areas  Summer. 6-week session. 3 credits. T W R F 2:30–4:30. R. Bar-El.
Analyses the possible role of industrialization in the development of rural areas. The basic elements of industrial planning described in terms of plant size, location of the facility, geographical concentration or dispersal, relations with agricultural activities. An analysis of the different elements of industrial development would be in view of both the existing constraints on rural areas (rural and small cities [in terms of infrastructure, services, educational level of the population, attitudes]) and the development targets (such as employment generation, increase of standard of living, diminution of internal migration).

464 Rural Planning Issues (also City and Regional Planning 719) Summer. 3-week session. 3 credits. M T W R F 9:30–12. C. Geisler, M. Lapping.
A synthesis of, and introductions to, theories, issues, and problems of integrated rural planning in the North American context. Addresses the rural-small-town sector in North America, the emergence of dependency, land and tenure, the means of production in rural economies, the changing structure of agriculture and implications for rural planning, single-resource based economies and socioeconomic vulnerabilities (forestry, fisheries, tourism, and mining), local economic development, energy, development strategies, and rural planning as a progressive posture.

497 Informal Study Fall or spring. 1–3 credits (may be repeated for credit). 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
Informal study may include a reading course, research experience, or public service experience.

A review of theory, empirical studies, and policy prescriptions as applied to communities and regions, especially those in developing countries. Human ecology, the Weberian tradition, cenital place, dependency/political economy, and symbolic structural theory are compared.]

[518 Research Design I Fall. 4 credits.
First of a two-semester sequence (may be taken individually) in graduate methods. 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, including multidimensional techniques. Students are expected to use actual data for lab work.]

[519 Research Design II Spring. 4 credits.
Prerequisite: an introductory methods course or a statistics course. Not offered 1983–84. M W F 10:10. lab to be arranged. J. D. Francis.
The second part of the sequence in graduate methods deals 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. Also discussed are sampling frames, some pragmatic sampling techniques, and some common errors in analysis procedures appropriate under each. Students are expected to use actual data to familiarize themselves with data handling and processing.]

An exploration of various sociological approaches to the study of society and its physical environment and an analysis of major issues relating to the survival base of human societies—particularly overpopulation, the limits-to-growth debate, and the conduct of political struggles over energy and environmental policy.]

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.]

A survey of major issues concerning the relation of states to international and national institutions. Emphasis is placed on the role of government institutions in the foreign and foreign policies of states. The relationships of states, derived from their economic and political structures, are discussed.]

[650 Social Organization of Agriculture Fall. 3 credits. R 1:25–4:25. F. C. Erickson.
Concentrates on a small number of significant commercial crops, examining the institutions and relationships involved in the production process: research, credit, distribution of inputs, the farm operation, processing, transportation, and marketing. Patterns at the farm and community level, including topics such as settlement, land tenure, ethnic groups, class structure, methods of cooperation, small farmers, labor problems, and information networks. Ecological and physical constraints on production. Emphasis on the influence of national and international structures—political, social, and economic—on the production process, including the role of governments and international agencies. Emphasizes the contextual and historical circumstances giving rise to the present crop systems. Consideration of how rearrangements of the political, social, and economic structures, both domestic and international, are required for change in crop systems, improvement in production, and increased social welfare.]

An analysis of the structural transformations of United States agriculture in the twentieth century, particularly 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.]

[706 State, Economy, and Society Fall. 3 credits. Recommended: one graduate-level course in classical sociological theory. T 7–10 p.m. F. H. Buttel.
Reviews major issues concerning the relations between political and economic institutions, including the political-economic methodologies of the classical sociological theorists, the instrumentalist-structuralist debate, and the role of the state, theories of crisis in advanced capitalism, and the controversies among theorists of unequal exchange, dependency, and imperialism in the world system.]

A graduate seminar dealing with the design of field research, specifically the articulation of theory and methods. Readings illustrate different theoretical orientations and methodological techniques. Substantive problems dealt with include technological change, social stratification, dependency, and modes of production. 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 statistics.
M W F 10:10. lab to be arranged. J. D. Francis.
An advanced course in measurement and scaling, building from work by Thurstone and Coombs to multidimensional scaling models. Topics include factorial analysis, factor-analysis models, factoring design, factoring techniques, and comparison with factor-analysis models. Multidimensional scaling and discriminant analyses are also discussed. As matrix algebra is a integral part of these procedures, class time is devoted to this topic.]

Methods for describing, monitoring, and evaluating both general and multiple regression models. The extraction of these models are discussed. In the middle part of the course consideration is given to violations of assumptions and their effects. Then more advanced regression concepts are discussed. The latter half of the course deals with recursive and nonrecursive path models.]

[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 socioenvironmental relationships and applies these perspectives to public policy and development problems. The theoretical perspectives explored are drawn from human ecology, ecological anthropology, and environmental sociology. Policy issues from developed and developing country settings are examined using ecological perspectives.]

The recent research explosion in this area is approached in terms of the several fundamental explanatory strategies, and a comparison of class-based and region-based movements, and research on the United States and the Third World.]

The seminar acquaints students with the evolution of property rights and property analysis procedures appropriate under each. Students are expected to use actual data to familiarize themselves with data handling and processing.]

70 Agriculture and Life Sciences
A consideration of problems of implementing change occurs. Sociologist as a researcher, as a strategist, and as a participant, and on the different contexts within which developmental change occurs. Focus is also on institutional constraints on the property as community development occurs, and changing definitions of “community.”

Applications of Sociology to Development Programs

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.

Sociotechnical Aspects of Irrigation (also Agricultural Economics 754 and Agricultural Engineering 754)


Examine irrigation 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.

Special Seminar

Fall or spring. Credit to be arranged. Limited to graduate students. Others by permission of instructor.

Teaching Experience

Fall or spring. 1–3 credits. Limited to graduate students. S-U grades only.

Participation in the ongoing teaching program of the department.

Public Service Experience

Fall or spring. Credit to be arranged. Limited to graduate students. S-U grades optional.

Participation in the ongoing public service activities of the department.

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.

Rural Sociology

Development Sociology

Organization Behavior and Social Action

Methods of Sociological Research

Research

Statistics and Biometry


Courses in statistics and biometry are offered by the Department of Plant Breeding and Biometry.
72 Agriculture and Life Sciences

[662 Mathematical Ecology (also Biological Sciences 662) Spring. 3 credits. Prerequisites: a year of college-level statistics. Offered in alternate years. Not offered 1983–84. Mathematical and statistical analysis of populations and communities. Theory and methods. Spatial and temporal pattern analysis, deterministic and stochastic models of population dynamics. Model formulation, parameter estimation, simulation and analytical techniques.]

699 Special Problems in Statistics and Biometry
Fall, spring, or summer. 1 credit or more by arrangement with instructor.

701 Advanced Biometry
Spring. 3 credits. Prerequisites: Statistics 409 and 602. T R 1:30–2:45. D. S. Robson. Biostatistical 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; enzyme kinetics and pharmacokinetic analysis; bioavailability.

713 Experimental Design
Fall. 4 credits. Prerequisites: either Statistics 416 and 602 or equivalent. Offered alternate years. W. T. Federer. Principles and techniques of experimentation: theoretical concepts; extensions and variations of the completely randomized, generalized blocked, and randomized block designs. Repeated measures designs, test 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 1983–84. Treatment design, the selection of treatments for an experiment, is divided into factorial, response surface, mixed models, and combinations of these. Single degree of freedom contrast matrices, factorial design theory for prime powers and nonprime powers, confounding, split plot, split block, complex confounded designs, lattice designs, factorial and fractional replication, response surface designs, and designs and analyses for mixtures, including diallel crossing designs, are covered. Statistical analyses involving residual analysis and real data are included. Emphasis is on concepts and applications rather than mathematical manipulations.

717 Linear Models
Spring. 3 credits. Prerequisites: Statistics 409, 417, and 602 or Mathematics 472. S-U grades only. Offered alternate years. T R 10:10–11:25. S. R. Searle. Introduction to multivariate normal variables and distribution of quadratic forms; linear statistical models, estimable functions, and testable hypotheses, regression models, experimental design models, and variance component models and combinations thereof.

799 Statistical Consulting
Fall and spring. 2 credits. Limited to graduate students. Consulting, 1 hour a week; disc, W 1:25–2:15. Staff. 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.

800–990 Research
Fall or spring. Credit to be arranged. Limited to candidates for graduate degrees. Prerequisite: permission of the graduate field member concerned. S-U grades only. Research at the M.S. (890) or Ph.D. (990) level.

Vegetable Crops
E. E. Ewing, chairman; L. Ellerbrook, J. R. Hicks, W. C. Kelly, L. D. Topoleski, D. H. Wallace, H. C. Wien

103 General Horticulture
Spring. 4 credits. Each lab limited to 25 students. Lecs, M W F 8, lab, M T W R 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 practical experience or training in plant science.

123 Organic Gardening
Spring. 2 credits. Each section limited to 25 students. Lecs, M W F 11:15, lab, M T W R 2–4:25. L. D. Topoleski. Studies the principles of organic gardening and practical problems of vegetable crops.

210 Vegetable Types and Identification
Fall 2 credits. T 10:10–12:05 or 2–4:15. 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, seedling, nutrient deficiencies, vegetable judging, grading, and grade defects.

211 Commercial Vegetable Crops
Fall. 4 credits. Each section limited to 25 students. Prerequisites: Vegetable Crops 103 and Agronomy 200. Field trip fees, no more than $20. Lecs, M W F 11:15, lab, W or F 2–4:25; field trips (Sept.). W 11:15–6. L. A. Erlenbrock. Intended for those interested in the commercial vegetable industry from the viewpoint of production, processing, marketing, or the related service industries. Topics include production techniques, problems and trends in the culture, harvesting, and storage of the major vegetable crops, including potatoes.

312 Postharvest Handling and Marketing of Vegetables
Fall. 3 credits. Lecs, T R 9:30; lab, R 2–4:25; field trips in early fall. J. R. Hicks. Procedures used in marketing and shipping vegetables, including grading standards, methods of grading, packaging, harvesting methods, cooling principles, storage techniques, and market preparation.

401 Vegetable Crop Physiology
Fall. 5 credits. Prerequisites: Vegetable Crops 211 and Biological Sciences 242 or 243. Lecs, M W F 11:15, lab, M 2–4:25, disc, R or F 1, 2, or 3. W. C. Kelly. 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, pollinization, 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 1983–84. Lab, W F 2–4:25. H. C. Wien. Designed to help students achieve proficiency in the evaluation of vegetable crops 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. Prerequisites: Any crop production course or permission of instructor. Not offered 1983–84. Lecs, M W F; disc, F. P. L. Minotti. The manner in which plants affect the growth of other plants is examined with emphasis on crop situations rather than natural plant communities. Interactions in monoculture are considered as well as crop–crop associate crop interactions and weed–crop interactions. Fridays are devoted to a discussion of weed control methods widely used in the production of vegetable crops.

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.

501 Seminar
Fall or spring. 1 credit. Required of graduate students majoring or minoring in vegetable crops. Limited to graduate students. S-U grades only.

610 Special Topics in Vegetable Crops
Fall or spring. 1 or more credits. Hours to be arranged. Staff.

612 Postharvest Physiology of Horticultural Crops
Spring. 2 credits. Prerequisite: permission of instructor. Offered alternate years. Not offered 1983–84. T R 8–9. P. M. Ludford. Physiological and biochemical aspects of growth and maturation, ripening, and senescence of harvested horticultural plant parts. Topics include morphological and compositional changes in ripening and during storage life, some physiological disorders, aspects of hormone action and interaction, and a consideration of control.

620 Teaching Experience
Fall or spring. 1 or more credits by arrangement with instructor. Hours to be arranged. Staff. Participation in the teaching program of the department.

630 Research Methods in Applied Plant Science
Spring. 3 credits. Prerequisite: permission of instructor. Offered alternate years. Not offered 1983–1984. T R 9:05–11. W. C. Kelly. The planning of applied research programs. The advantages and limitations of conventional experimental designs as they apply to specific research problems. Discussions include a critical interpretation of experimental results from the literature.

801 Master’s Thesis Research
Fall or spring. Credit to be arranged. S-U grades only. Hours to be arranged. Staff.

801 Doctoral Thesis Research
Fall or spring. Credit to be arranged. S-U grades only. Hours to be arranged. Staff.

Related Course in Another Department

Special Topics in Plant Science Extension (Plant Breeding 629)
Faculty Roster

Abawi, George S., Ph.D., Cornell U. Assoc. Prof., Plant Pathology (Geneva)
Acree, Terry E., Ph.D., Cornell U. Prof., Food Science and Technology (Geneva)
Adleman, Marvin I., M.A., Harvard U. Prof., Entomology (Geneva)
Annisie, Harry R., Ph.D., Kansas State U. Prof., Animal Science
Ast, James R., Ph.D., U. of Wisconsin Assoc. Prof., Plant Pathology
Atbright, Louis G., Ph.D., Cornell U. Assoc. Prof., Agricultural Engineering
Atceno, R., Ph.D., U. of Wisconsin. Assoc. Prof., Seed and Vegetable Sciences (Geneva)
Alexander, Martin, Ph.D., U. of Wisconsin. Liberty Hyde Bailey Professor of Soil Science, Agronomy
Aiee, David J., Ph.D., Cornell U. Prof., Agricultural Economics
Anderson, Bruce L., Ph.D., U. of California at Berkeley. Asst. Prof., Agricultural Economics
Anderson, Ronald E., Ph.D., U. of Wisconsin. Prof., Plant Breeding and Biometry
Appar, Barbara J., Ph.D., Cornell U. Asst. Prof., Animal Science
Aplin, Richard D., Ph.D., Cornell U. Prof., Agricultural Economics
Amenos, Phil A., Ph.D., U. of Wisconsin. Assoc. Prof., Plant Pathology
Austic, Richard E., Ph.D., U. of California at Davis. Assoc. Prof., Poultry and Avian Sciences
Awa, Ajoku E., Ph.D., Cornell U. Assoc. Prof., Communication Arts
Baer, Richard A., Ph.D., Harvard U. Prof., Natural Resources
Ball, Joe P., Ph.D., Michigan State U. Prof., Education
Baker, Robert C., Ph.D., Purdue U. Prof., Poultry and Avian Sciences
Bander, David K., M.P.S., Cornell U. Assoc. Prof., Food Science
Bararno, David M., Ph.D., Cornell U. Asst. Prof., Food Science
Barker, Randolph, Ph.D., Iowa State U. Assoc. Prof., Agricultural Economics
Barrett, Milton L., Ph.D., Cornell U. Prof., Rural Sociology
Barton, Donald W., Ph.D., U. of California at Berkeley. Prof., Seed and Vegetable Sciences (Geneva)
Bartsch, James A., Ph.D., Purdue U. Asst. Prof., Agricultural Engineering
Bauman, Dale E., Ph.D., U. of Illinois. Prof., Animal Science
Bayer, George H., Ph.D., Cornell U. Prof., Vegetable Crops
Beer, Steven V., Ph.D., U. of California at Davis. Assoc. Prof., Plant Pathology
Beermann, Donald H., Ph.D., U. of Wisconsin. Prof., Animal Science
Bergstrom, Gay 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
Bing, Arthur D., Ph.D., Cornell U. Prof., Floriculture and Ornamental Horticulture
Blair, David F., Ph.D., Manchester U. Assoc. Prof., Agricultural Economics
Blanpied, George D., Ph.D., Michigan State U. Prof., Pomology
Bohn, Stephen E., Ph.D., Penn State U. Prof., Poultry and Avian Sciences
Bosworth, Richard N., Ph.D., U. of Minnesota. Prof., Agricultural Economics
Boulder, David R., Ph.D., Iowa State U. Assoc. 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)
Bouthyette, Pierre-Yves, Ph.D., Cornell Asst. Prof., Plant Breeding and Biometry
Bowers, William S., Ph.D., Purdue U. Prof., Entomology (Geneva)
Boyd, R. Dean, Ph.D., U. of Nebraska Asst. Prof., Animal Science
Boynton, William H., Ph.D., Michigan State U. Assoc. Prof., Agricultural Economics
Brake, 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
Brooke, Bill B., Ph.D., North Carolina State U. Prof., Plant Pathology
Brown, William L., Jr., Ph.D., Harvard U. Prof., Entomology
Bruce, Robert L., Ph.D., Cornell U. Prof., Education
Bryant, Ray M., Ph.D., Purdue U. Asst. Prof., Agronomy
Bugliani, Joseph B., L.L.B., Cornell U. Prof., Agricultural Law
Burt, Thomas J., Ph.D., U. of California at Berkeley. Asst. Prof., Plant Pathology (Geneva)
Butler, Walter R., Ph.D., Purdue U. Assoc. Prof., Animal Science
Butler, Frederick H., Ph.D., U. of Wisconsin. Assoc. Prof., Rural Sociology
Caid, David L., Ph.D., Cornell U. Prof., Agricultural Economics
Campbell, Joseph K. M.S., Cornell U. Assoc. Prof., Agricultural Engineering
Capener, Harold R., Ph.D., Cornell U. Prof., Rural Sociology
Carr, Raymond J., Ph.D., Michigan State U. Asst. Prof., Entomology
Casella, George F., Ph.D., Purdue U. Asst. Prof., Plant Breeding and Biometry
Casler, 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 Science
Coffman, William R., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
Coffe, Royal D., Ph.D., Cornell U. Prof., Agronomy
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
Conner, George J., Ph.D., Penn State U. Prof., Agricultural Economics
Conrad, Jon 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
Creasy, Leroy L., Ph.D., U. of California at Davis. Prof., Pomology
Cummins, Gordon J., Ph.D., Cornell U. Prof., Rural Sociology
Cummins, James N., Ph.D., Southern Illinois U. Prof., Pomology and Viticulture (Geneva)
Cunningham, Daniel L., Ph.D., Virginia Polytechnic Inst. Asst. Prof., Poultry and Avian Sciences
Currie, W., Ph.D., U. of Illinois. Assoc. Prof., Entomology
Currie, W. Bruce, Ph.D., Macquarie U. Assoc. Prof., Animal Science
Cushman, Harold R., Ph.D., Cornell U. Prof., Education
Davis, Alexander C., Ph.D., Cornell U. Prof., Entomology (Geneva)
Day, Lee M., Ph.D., U. of Minnesota. Prof., Agricultural Economics
Delwiche, Eugene A., Ph.D., Cornell U. Prof., Microbiology
Dethier, Bernard E., Ph.D., Johns Hopkins U. Prof., Agronomy
Dimock, James E., Ph.D., Cornell U. Prof., Entomology
Dickey, Robert S., Ph.D., U. of California at Berkeley. Prof., Plant Pathology
Dickson, Michael H., Ph.D., Michigan State U. Prof., Seed and Vegetable Sciences (Geneva)
Dietert, Rodney R., Ph.D., U. of Texas at Austin. Asst. Prof., Poultry and Avian Sciences
Docktery, Terence R., Ph.D., Ohio State U. Asst. Prof., Animal Science
Dolan, Desmond C., Ph.D., Cornell U. Assoc. Prof., Seed and Vegetable Sciences (Geneva)
Dondor, Norman C., Ph.D., Cornell U. Prof., Microbiology
Downing, Donald L., Ph.D., U. of Georgia. Prof. Food Science and Technology (Geneva)
Drake, William E., Ph.D., Michigan State U. Prof., Education
Duke, William B., Ph.D., U. of Illinois. Prof. Agronomy
Dunn, James A. Ph.D., U. of Michigan. Prof., Education
Dunford, Deanna, Ph.D., Colorado State U. Asst. Prof., Agricultural Engineering
Dubois, John M., Ph.D., U. of Birmingham. Assoc. Prof., Agronomy
Earle, Elizabeth D., Ph.D., Harvard U. Assoc. Prof., Plant Breeding and Biometry
Ebert, Paul R., Ph.D., U. of Michigan. Assoc. Prof., Rural Sociology
Eckenrode, Charles J., Jr., Ph.D., U. of Wisconsin. Prof., Entomology (Geneva)
Eggen, John R., Ed. D., Cornell U. Prof., Education
Eickwort, George C., Ph.D., U. of Kansas. Prof., Entomology
Ellerbrook, LeRoy A., Ph.D., Cornell U. Asst. Prof., Vegetable Crops
Eliot, John M., Ph.D., Cornell U. Prof., Animal Science
Erickson, Eugene C., Ph.D., Michigan State U. Prof., Rural Sociology
Everett, Herbert L., Ph.D., Yale U. Prof., Plant Breeding and Biometry
Everett, Robert W., Ph.D., Michigan State U. Prof., Animal Science
Ewing, Eimer E., Ph.D., Cornell U. Prof., Vegetable Crops
Fahey, Timothy J., Ph.D., U. of Wyoming. Asst. Prof., Natural Resources
Federer, Walter T., Ph.D., Iowa State U. Liberty Hyde Bailey Professor of Agricultural Statistics, Plant Breeding and Biometry
Fick, Gary W., Ph.D., U. of California at Davis. Assoc. Prof., Agronomy
Fiori, Bart J., Ph.D., Cornell U. Assoc. Prof., Entomology (Geneva)
Fischer, Charles C., M.S., Michigan State U. Assoc. Prof., Floriculture and Ornamental Horticulture
Fischer, Richard B., Ph.D., Cornell U. Prof., Education
Fitzgerald, James A., Ph.D., Cornell U. Asst. Prof., Animal Science
Foote, Robert H., Ph.D., Cornell U. Jacob Gould Schurman Professor, Animal Science
Foraker, Olan B., Ph.D., U. of California at Berkeley. Prof., Agricultural Economics
Forster, Chesley G., Ph.D., Ohio State U. Prof., Pomology and Viticulture (Geneva)
Fox, Danny L., Ph.D., Ohio State U. Assoc. Prof., Animal Science
Fox, Raymond T., Ph.D., Cornell U. Prof., Floriculture and Ornamental Horticulture
Friesen, Joe D., Ph.D., U. of Missouri. Assoc. Prof., Agricultural Economics
Fry, William E., Ph.D., Cornell U. Assoc. Prof., Plant Pathology
Furry, Ronald B., Ph.D., Iowa State U. Prof., Agricultural Engineering
Galton, David M., Ph.D., Ohio State U. Asst. Prof., Animal Science
Garrett, Patricia, Ph.D., U. of Wisconsin. Assoc. Prof., Rural Sociology
Hullar, Theodore L., Ph.D., U. of Minnesota. Prof., Agricultural Engineering
Hrazdina, Geza, Ph.D., Eidg. Technische Hochschule (Geneva). Prof., Agricultural Economics
Ghiorse, William C., Ph.D., Rensselaer Polytechnic Inst. Asst. Prof., Microbiology
Gluck, Marvin D., Ph.D., Iowa State U. Prof., Education
Gloe, Steven P., Ph.D., U. of New Mexico. Asst. Prof., Natural Resources
Gonzales, Dennis, Ph.D., U. of California at Davis. Assoc. Prof., Plant Pathology (Geneva)
Good, George L., Ph.D., Cornell U. Prof., Floriculture and Ornamental Horticulture
Goodrich, Dana C., Ph.D., Cornell U. Prof., Agricultural Economics
Gore, Ronald C., Ph.D., Michigan State U. Assoc. Prof., Animal Science
Gortz, Carl F., Ph.D., Michigan State U. Prof., Floriculture and Ornamental Horticulture
Gowan, D. Bob, Ph.D., Yale U. Prof., Education
Gracen, Vernon E., Jr., Ph.D., U. of Florida. Prof., Plant Breeding and Biometry
Graham, Donald C., Ph.D., Cornell U. Assoc. Prof., Food Science
Gravatt, Robert B., Ph.D., Cornell U. Assoc. Prof., Food Science
Greenberg, E. Peter, Ph.D., U. of Massachusetts. Assoc. Prof., Microbiology
Gregory, Peter, Ph.D., Kings Coll. Assoc. Prof., Plant Breeding and Biometry
Grunes, David L., Ph.D., U. of California at Berkeley. Prof., Agronomy
Guest, Richard W., M.S., North Dakota Coll. Assoc. Prof., Education
Gunkel, Wesley W., Ph.D., Michigan State U. Prof., Agricultural Engineering
Gyrisco, George G., Ph.D., Cornell U. Prof., Entomology
Hagedorn, Henry H., Ph.D., U. of California at Davis. Assoc. Prof., Entomology
Hath, Douglas A., Ph.D., Cornell U. Prof., Agricultural Engineering
Hall, Lana L., Ph.D., U. of California at Berkeley. Asst. Prof., Plant Pathology
Hall, Walter E., Ph.D., Colorado State U. Prof., Seed and Vegetable Sciences (Geneva)
Harrison, Martin B., Ph.D., Cornell U. Assoc. Prof., Plant Pathology
Hedlund, Dalva E., Ph.D., Colorado State U. Assoc. Prof., Education
Hicks, James R., Ph.D., U. of Maryland. Assoc. Prof., Vegetable Crops
Hintz, Harold F., Ph.D., Cornell U. Prof., Animal Science
Hoch, Harvey F., Ph.D., U. of Wisconsin. Assoc. Prof., Plant Pathology
Hogue, Douglas E., Ph.D., Cornell U. Prof., Animal Science
Hooid, Lamarme F., Ph.D., Penn State U. Prof., Food Science
Horst, R. Kenneth, Ph.D., Ohio U. Prof., Plant Pathology
Holtzclaw, Joseph H., Ph.D., Oregon State U. Asst. Prof., Food Science
How, Richard B., Ph.D., Cornell U. Prof., Agricultural Economics
Huang, Zhiyi, Ph.D., Eidg. Technische Hochschule at Zurich (Switzerland). Prof., Food Science and Technology (Geneva)
Hudler, George W., Ph.D., Colorado State U. Asst. Prof., Plant Pathology
Hullar, Theodore L., Ph.D., U. of Minnesota. Prof., Natural Resources
Hunter, James E., Ph.D., U. of New Hampshire. Prof., Plant Pathology (Geneva)
Irish, Wmnot W., M.S., U. of Illinois. Prof., Agricultural Engineering
Irwin, Lynne H., Ph.D., Texas A&M U. Assoc. Prof., Agricultural Engineering
Jewell, William S., Ph.D., Stanford U. Prof., Agricultural Engineering
Jewett, Donald L., M.S., Michigan State U. Assoc. Prof., Cooperative Extension
Johnson, Katherine M., Ph.D., U. of Minnesota. Asst. Prof., Food Science and Technology (Geneva)
Johnson, Warren T., Ph.D., U. of Maryland. Prof., Entomology
Jones, Edward D., Ph.D., U. of Wisconsin. Prof., Plant Pathology
Jordan, William K., Ph.D., Cornell U. Prof., Food Science
Keller, Robert J., Ph.D., U. of Wisconsin. Prof., Agricultural Economics
Kelley, John W., Ph.D., Cornell U. Assoc. Prof., Natural Resources
Kemmler, William C., Ph.D., Cornell U. Prof., Plant Pathology
Kennedy, W. Keith, Ph.D., Cornell U. Prof., Agronomy
Keshavarz, Kavous, Ph.D., U. of Georgia. Asst. Prof., Plant Breeding and Biometry
Khamsan, Aravat, Ph.D., U. of Chicago. Prof., Seed and Vegetable Sciences (Geneva)
Kinsella, John E., Ph.D., Penn State U. Liberty Hyde Bailey Professor of Food Science, Food Science and Technology (Geneva)
Knoeblauch, Wayne A., Ph.D., Michigan State U. Assoc. Prof., Agricultural Economics
Korf, Richard P., Ph.D., Cornell U. Prof., Plant Pathology
Kosinski, Frank V., Ph.D., Cornell U. Prof., Food Science
Kramer, John P., Ph.D., U. of Illinois. Prof., Entomology
Kubota, Joe, Ph.D., U. of Wisconsin. Prof., Agronomy
LaDue, Eddy L., Ph.D., Michigan State U. Assoc. Prof., Agricultural Economics
Laks, Alan N., Ph.D., U. of California at Davis. Assoc. Prof., Pomology and Viticulture (Geneva)
Lamb, Robert C., Ph.D., U. of Michigan. Prof., Pomology and Viticulture (Geneva)
Lambert, Robert J., Jr., M.S., U. of Michigan. Prof., Pomology and Viticulture (Geneva)
Lawrence, James E., M.S., Syracuse U. Assoc. Prof., Communicable Arts
Lazarus, William F., Ph.D., U. of Illinois. Asst. Prof., Agricultural Economics
Ledford, Richard A., Ph.D., Cornell U. Prof., Food Science
Lee, Chang Y., Ph.D., Utah State U. Prof., Food Science and Technology (Geneva)
Lee, David R., Ph.D., U. of Wisconsin. Asst. Prof., Agricultural Economics
Lesser, William H., Ph.D., U. of Wisconsin. Asst. Prof., Agricultural Economics
Levine, Gilbert, Ph.D., Cornell U. Prof., Agricultural Engineering
Liebman, Arthur S., M.S., Cornell U. Prof., Floriculture and Ornamental Horticulture
Liebner, James K., Ph.D., U. of California at Berkeley. Assoc. Prof., Entomology
Lierk, Siegfried E., Ph.D., U. of Illinois. Prof., Entomology (Geneva)
Linscott, Dean L., Ph.D., U. of Nebraska. Prof., Plant Pathology
Lisk, Donald J., Ph.D., Cornell U. Prof., Vegetable Crops
Liu, Frank W., Ph.D., Cornell U. Assoc. Prof., Pomology
Loehr, Raymond C., Ph.D., U. of Wisconsin. Liberty Hyde Bailey Professor of Agricultural Engineering
Lorbeer, James W., Ph.D., U. of California at Berkeley. Prof., Plant Pathology
Lora, Rosemary, M.S., Michigan State U. Asst. Prof., Plant Pathology
Low, Carl D., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
Lucey, Robert F., Ph.D., Michigan State U. Prof., Agronomy
Ludford, Pamela M., Ph.D., Cornell U. Asst. Prof., Vegetable Crops
Ludington, David C., Ph.D., Purdue U. Prof., Agricultural Engineering
McCabe, Murray B., Ph.D., Michigan State U. Assoc. Prof., Agronomy
McCormick, Charles C., Ph.D., North Carolina State U. Asst. Prof., Poultry and Avian Sciences
McCrimmon, Donald A., Ph.D., North Carolina State U. Asst. Prof., Natural Resources
McCulloch, Charles E., Ph.D., Cornell U. Asst. Prof., Plant Breeding and Biometry
McDowell, Robert E., Ph.D., U. of Maryland. Prof., Animal Science
McLaughlin, Edward W., Ph.D., Michigan State U. Assoc. Prof., Agricultural Economics
McLellan, Mark R., Ph.D., Michigan State U. Asst. Prof., Food Science and Technology (Geneva)
McNeil, Robert A., Ph.D., U. of Michigan. Assoc. Prof., Agricultural Economics
McIntosh, Leonard R., Ph.D., U. of Connecticut. Prof., Food Science and Technology (Geneva)
Merrill, William G., Ph.D., Cornell U. Prof., Animal Science
Mertz, Joseph F., Jr., Ph.D., Cornell U. Prof., Agricultural Economics
Millar, Roy L., Ph.D., Cornell U. Prof., Plant Pathology
Miller, Dennis D., Ph.D., Cornell U. Asst. Prof., Food Science
Miller, Robert D., Ph.D., Cornell U. Prof., Agricultural Engineering
Milligan, Robert A., Ph.D., U. of California at Davis. Assoc. Prof., Agricultural Economics
Milman, Jason P., Ph.D., U. of Michigan. Prof., Education
Minotti, Peter L., Ph.D., North Carolina State U. Assoc. Prof., Vegetable Crops
Moen, Aaron N., Ph.D., U. of Minnesota. Prof., Natural Resources
Monk, David H., Ph.D., U. of Chicago. Asst. Prof., Education
Morrow, Robert R., Jr., Ph.D., Syracuse U. Prof., Natural Resources
Morse, Roger A., Ph.D., Cornell U. Prof., Entomology
Mortlock, Robert P., Ph.D., U. of Illinois. Prof., Microbiology
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
Muck, Richard E., Ph.D., Cornell U. Asst. Prof., Agricultural Engineering
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 A., Ph.D., U. of Wisconsin. Asst. Prof., Plant Breeding and Biometry
Negm, Fawzy B., Ph.D., California at Riverside. Asst. Prof., Floriculture and Ornamental Horticulture
Noble, Lucinda A., Ph.D., U. of North Carolina. Prof., Extension
Novak, Joseph D., Ph.D., Minnesota. Prof., Agricultural Economics
Novakovic, Andrew M., Ph.D., Purdue U. Asst. Prof., Agricultural Economics
Obendorf, Ralph L., Ph.D., U. of California at Davis. Prof., Agronomy
Oberly, Gene H., Ph.D., Michigan State U. Prof., Pomology
Ogelsby, Ray T., Ph.D., U. of North Carolina. Prof., Natural Resources
Olson, Gerald W. Ph.D., U. of Wisconsin. Assoc. Prof., Agronomy
Olenacu, Elizabeth A., Ph.D. U. of Minnesota. Asst. Prof., Animal Science
Olenacu, Pascal A., Ph.D., U. of Minnesota. Assoc. Prof., Animal Science
Ostman, Ronald E., Ph.D., U. of Minnesota. Assoc. Prof., Communication Arts
Oyer, Edwin B., Ph.D., Purdue U. Prof., Vegetable Crops
Paine, Douglas A., Ph.D., SUNY at Albany. Assoc. Prof., Agronomy
Pardee, William D., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
Pearson, Roger C., Ph.D., U. of California at Davis. Assoc. Prof., Plant Pathology (Geneva)
Peck, Nathan H., Ph.D., Cornell U. Prof., Seed and Vegetable Crops
Peck, Nathan H., Ph.D., Cornell U. Prof., Seed and Vegetable Sciences (Geneva)
Peckarsky, Barbara L., Ph.D., U. of Wisconsin. Asst. Prof., Entomology
Petrovich, M. A., Michigan State U. Asst. Prof., Prof., Floriculture and Ornamental Horticulture
Perley, John H., Ph.D., U. of Illinois. Assoc. Prof., Agronomy
Pimentel, David, Ph.D., Cornell U. Prof. Entomology
Pitt, Ronald E., Ph.D., Cornell U. Asst. Prof., Agricultural Engineering
Ploeter, Robert L., Ph.D., Iowa State U. Prof., Plant Breeding and Biometry
Poleman, Thomas T., Ph.D., Stanford U. Prof., Agricultural Economics
Pollak, E. John, Ph.D., Iowa State U. Assoc. Prof., Animal Science
Poul, Robert L., Ph.D., Cornell U. Assoc. Prof., Poultry and Avian Sciences
Potter, Norman N., Ph.D., Iowa State U. Food Science
Powell, Loyd E., Jr., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
Quaas, Richard L., Ph.D., Colorado State U. Assoc. Prof., Animal Science
Rauffeugiger, Edgar M., Ph.D., U. of Wisconsin. Prof., Entomology
Ranney, Christine K., Ph.D., U. of California at Davis. Asst. Prof., Agricultural Economics
Rao, M. Anandha, Ph.D., Ohio State U. Assoc. Prof., Food Science and Technology (Geneva)
Regenstein, John M., Ph.D., Brandeis U. Assoc. Prof., Poultry and Avian Sciences
Renkugler, Gerald E., Ph.D., Iowa State U. Prof., Agricultural Engineering
Reid, W. Shaw, Ph.D., Michigan State U. Prof., Agronomy
Reisch, Bruce, Ph.D., U. of Wisconsin. Asst. Prof., Poultry and Viticulture (Geneva)
Reissig, William J., Ph.D., Oregon State U. Assoc. Prof., Entomology (Geneva)
Reisch, Milo E., Ph.D., U. of Missouri. Assoc. Prof., Natural Resources
Riedi, Helmut, Ph.D., Michigan State U. Assoc. Prof., Entomology (Geneva)
Roba, Susan, Ph.D., Washington State U. Charles Lathrop Pack Professor, Asst. Prof., Agronomy
Ripple, Richard E., Ph.D., U. of Wisconsin. Prof., Education
Rivz, Syed S., Ph.D., Ohio State. Assoc. Prof., Food Science
Robinson, Kenneth L., Ph.D., Harvard U. Liberty Hyde Bailey Professor of Agricultural Economics, Agricultural Economics
Robinson, Richard W., Ph.D., Cornell U. Prof., Seed and Vegetable Sciences (Geneva)
Robson, Douglas S., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
Rochow, William F., Ph.D., Cornell U. Prof., Plant Pathology
Rockcastle, Venne N., Ph.D., Cornell U. Prof., Education
Roeiots, Wendell L., Ph.D., Indiana U. Liberty Hyde Bailey Professor of Insect Biochemistry. Entomology (Geneva)
Rosenberg, David A., Ph.D., Michigan State U. Asst. Prof., Plant Pathology (Geneva)
Russell, James B., Ph.D., U. of Illinois Asst. Prof., Animal Science
Rutk, Donald A., Ph.D., North Carolina State U. Asst. Prof., Entomology
Sabin, Samuel W., Ph.D., Oregon State U. Prof., Animal Science
Sanderson, Roger C., Ph.D., U. of Minnesota. Prof., Vegetable Crops
Sanford, John C., Ph.D., U. of Wisconsin. Asst. Prof., Pomology and Viticulture (Geneva)
Sawyer, Alan D., Ph.D., Michigan State U. Asst. Prof., Entomology
Schaefers, George A., Ph.D., U. of California at Berkeley. Prof., Entomology (Geneva)
Schiavo, Edward A., M.S., Michigan State U. Prof., Poultry and Avian Sciences
Schafauer, Ernest F., M.S., Cornell U. Prof., Floriculture and Ornamental Horticulture
Schrivcr, Herbert F., Ph.D., U. of Pennsylvania. Assoc. Prof., Plant Breeding and Biometry
Schwager, Steven J., Ph.D., Yale U. Asst. Prof., Plant Breeding and Biometry
Schwarz, Donald F., Ph.D., Michigan State U. Prof., Agricultural Economics
Scott, Bernice M., M.A., Columbia U. Assoc. Prof., Rural Sociology
Scott, Norman R., Ph.D., Cornell U. Prof., Agricultural Engineering
Scott, Thomas W., Ph.D., Michigan State U. Prof., Agronomy
Seay, Robert R., Ph.D., Cornell U. Prof., Agronomy
Searle, Shuyie R., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
Seeley, John G., Ph.D., Cornell U. Prof., Floriculture and Ornamental Horticulture
Seem, Robert C., Ph.D., Penn State U. Assoc. Prof., Plant Pathology (Geneva)
Semel, Maurice, Ph.D., Cornell U. Assoc. Prof., Entomology
Seiter, Timothy L., Ph.D., U. of Minnesota. Asst. Prof., Agricultural Economics
Sinclair, Wayne A., Ph.D., Cornell U. Prof., Plant Breeding and Biometry
Smith, Richard W., Ph.D., Washington State U. Assoc. Prof., Plant Pathology
Smith, Charles R., Ph.D., Cornell U. Asst. Prof., Natural Resources
Smith, Robert D., Ph.D., Cornell U. Assoc. Prof., Animal Science
Sniffen, Charles J., Ph.D., U. of Kentucky. Assoc. Prof., Animal Science
Snyder, Victor E., Ph.D., Cornell U. Asst. Prof., Agronomy
Soderland, David M., Ph.D., U. of California at Berkeley. Asst. Prof., Entomology (Geneva)
Sorells, Mark E., Ph.D., U. of Wisconsin. Assoc. Prof., Plant Breeding and Biometry
Spencer, James W., Ph.D., Stanford U. Prof., Agricultural Engineering
Spitzliebber, Don F., Ph.D., U. of Wisconsin. Prof., Food Science (Geneva)
Stamer, John R., Ph.D., Cornell U. Prof., Food Science and Technology (Geneva)
Stanton, Bernard F., Ph.D., U. of Minnesota. Prof., Agricultural Economics
Steenhuis, Tammo S., Ph.D., U. of Wisconsin. Asst. Prof., Agricultural Engineering
Steenkraus, Keith H., Ph.D., Iowa State U. Prof., Food Science and Technology (Geneva)
Stevenson, Victor R., M.A., Penn State U. Prof., Communication Arts
Steponkus, Peter L., Ph.D., Purdue U. Prof., Agronomy
Stiles, Warren C., Ph.D., Pennsylvania State U. Assoc. Prof., Entomology (Geneva)
Stoevens, Gilbert S., Ph.D., Cornell U. Prof., Food Science and Technology (Geneva)
Stouffer, James R., Ph.D., U. of Illinois. Prof., Animal Science
Straub, Richard W., Ph.D., U. of Missouri. Assoc. Prof., Entomology (Geneva)
Strke, Kenneth A., Ph.D., Northwestern U. Prof., Education
Suphin, H., Dean, Ph.D., Ohio State U. Asst. Prof., Education
Szkolnik, Michael, Ph.D, Rutgers U. Prof., Plant Pathology (Geneva)
Taschenberger, Emil F., Ph.D., Cornell U. Prof., Entomology (Geneva)
Tischler, Haruo, Ph.D., Cornell U. Prof., Entomology (Geneva)
Taub, Maurice J., Ph.D., U. of California at Berkeley. Prof., Entomology
Tauer, Warren L., Ph.D., Iowa State U. Asst. Prof., Agricultural Economics
Taylor, Alan G., Ph.D., Oklahoma State U. Asst. Prof. Seed and Vegetable Sciences (Geneva)
Tenney, Richard W., Ph.D., Pennsylvania State U. Asst. Prof., Education
Tennone, Michael L., Ph.D., U. of Minnesota. Assoc. Prof., Plant Science
Thurston, H. David, Ph.D., U. of Minnesota. Prof., Plant Pathology
Timmons, Michael B., Ph.D., Cornell U. Asst. Prof., Agricultural Economics
Tomk, William G., Ph.D., U. of Minnesota. Prof., Agricultural Economics
Tomkins, John R., Ph.D., Cornell U. Assoc. Prof., Pomology
Topoleski, Leonard D., Ph.D., Purdue U. Prof., Vegetable Crops
Trancik, Roger T. M. L., Harvard U. Asst. Prof., Floriculture and Ornamental Horticulture
VanBuren, Jerome P., Ph.D., Cornell U. Prof., Food Science and Technology (Geneva)
VanCampen, Darrell R., Ph.D., North Carolina State U. Assoc. Prof., Animal Science
VanDemark, Noland L., Ph.D., Cornell U. Prof., Animal Science
VanDemark, Paul J., Ph.D., Cornell U. Prof., Microbiology
VanEtten, Hams D., Ph.D., Cornell U. Assoc. Prof., Plant Pathology
VanSoest, Peter J., Ph.D., U. of Wisconsin. Prof., Animal Science
van Tienhoven, An., Ph.D. of Illinois. Prof. poultry and Avian Sciences
VanWinkle, Armand R., Ph.D., U. of Ghen (Belgium). Prof., Agronomy
Vander, Donald R., Ph.D., U. of Minnesota. Asst. Prof., Plant Breeding and Biometry
Vitturi, Morris I., Ph.D., Purdue U. Prof., Seed and Vegetable Sciences (Geneva)
Wagenet, Robert J., Ph.D., U. of California at Davis. Assoc. Prof., Agronomy
Walker, Larry P., Ph.D., Michigan State U. Asst. Prof., Agricultural Engineering
Walace, Donald H., Ph.D., Cornell U. Prof., Vegetable Crops
Walter, Patricia M., Ph.D., U. of Wisconsin. Asst. Prof., Food Science
Walter, Michael F., Ph.D., U. of Wisconsin. Assoc. Prof., Agricultural Engineering
Walter, 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

Way, Roger D., Ph.D., Cornell U. Prof., Pomology and
Viticulture (Geneva)

Webster, Dwight A., Ph.D., Cornell U. Prof., Natural
Resources

Weeden, Norman F., Ph.D., U. of California at Davis.
Asst. Prof., Seed and Vegetable Sciences (Geneva)

Prof., Entomology (Geneva)

Welch, Ross M., Ph.D., U. of California at Davis. Asst.
Prof., Agronomy

Wheeler, Quentin D., Ph.D., Ohio State U. Asst. Prof.,
Entomology

White, Gerald B., Ph.D., Penn State U. Asst. Prof.,
Agricultural Economics

White, Shirley A., Ph.D., Michigan State U. Prof.,
Communication Arts

Wien, Hans C., Ph.D., Cornell U. Asst. Prof.,
Vegetable Crops

Wilcox, Darlene, Ph.D., U. of Florida. Asst. Prof.,
Vegetable Crops

Wilkins, Bruce T., Ph.D., Cornell U. Prof., Natural
Resources

Wilkinson, Christopher F., Ph.D., U. of California at
Riverside. Prof., Entomology

Wilkinson, Robert E., Ph.D., Cornell U. Assoc. Prof.,
Plant Pathology

Wing, Kenneth E., Ph.D., Cornell U. Prof., Agriculture

Wright, Madison J., Ph.D., U. of Wisconsin. Prof.,
Agronomy

Yarbrough, J. Paul, Ph.D., Iowa State U. Prof.,
Communication Arts

Yoder, Olen C., Ph.D., Michigan State U. Assoc. Prof.,
Plant Pathology

Young, Frank W., Ph.D., Cornell U. Prof., Rural
Sociology

Young, Robert J., Ph.D., Cornell U. Prof., Animal
Science

Young, Roger G., Ph.D., U. of Oregon. Assoc. Prof.,
Entomology

Youngs, William D., Ph.D., Cornell U. Assoc. 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

Prof., Microbiology

Zitter, 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

Zuiches, James J., Ph.D., U. of Wisconsin. Prof., Rural
Sociology
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 Hall, 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 Tjaden Hall. Sculpture and shop facilities are in the Foundry. The Green Dragon, a student lounge, is located in the basement of Sibley Hall. The college has three darkrooms that are available for general use and serve as laboratories for the photography courses. A darkroom fee must be paid by each user. Information about darkroom rules and regulations, hours, and equipment is available in the slide library.

Through the generosity of the late Mrs. Lillian P. Heller, the college also owns the home of William H. Miller, the first student to enroll for the study of architecture at Cornell and later a practicing architect in Ithaca. This building is used to house visiting teachers and guests of the college and for occasional receptions and social events.

Libraries

The Fine Arts Library, in Sibley Dome, serves the College of Architecture, Art, and Planning through its collections on architecture, fine arts, and city and regional planning. The library, with more than 112,000 books, is capable of supporting undergraduate, graduate, and research programs. Some 1,800 serials are currently received and maintained. A slide library is maintained in Sibley Hall and contains 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 250,000 slides. The facilities of the libraries of other schools and departments on campus and the John M. Olin Library, designed primarily as a research library for graduate students, are also available.

Museums and Galleries

The Herbert F. Johnson Museum of Art was formally opened in May 1973. Although many of its exhibitions and activities relate directly to academic programs of the University, the museum has no administrative affiliation with any department. In this way, its programs freely cross academic boundaries and stimulate interdisciplinary 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 Hall and the gallery in 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 Tjaden Hall gallery and the H-tail 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 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 this college. 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 the 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 people who, before they
applied, had 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 four and fifth years, the 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, introduction to the thesis, special problems in architectural design, a professional seminar, and a professional studies course. 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, restraints relative to financing, zoning, development criteria, adaptive reuse, and multiuse developments.

Overlap Program

For qualified students, the department offers an option that combines the fifth year of the undergraduate program with the first year of the Master of Architecture program. In the fall of the fourth undergraduate year, interested students petition the department to substitute Arch 501–502 and Arch 510 (Thesis Introduction) for the last two years of the program only by petition and a review of their design record. Courses offered by the department include design, introduction to the thesis, special problems in architectural design, a professional seminar, and a professional studies course. 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, restraints relative to financing, zoning, development criteria, adaptive reuse, and multiuse developments.

Curriculum

First Year

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
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<tbody>
<tr>
<td>101 Design I</td>
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<tr>
<td>131 Introduction to Architecture</td>
<td>2</td>
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<tr>
<td>181 History of Architecture</td>
<td>3</td>
</tr>
<tr>
<td>151 Design Fundamentals I</td>
<td>2</td>
</tr>
<tr>
<td>191 Drawing I</td>
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<tr>
<td>Out-of-college elective</td>
<td>18</td>
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<tr>
<td><strong>Total credits</strong></td>
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<tr>
<th>Spring Term</th>
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<tr>
<td>102 Design II</td>
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<tr>
<td>182 History of Architecture II</td>
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<tr>
<td>152 Design Fundamentals II</td>
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<tr>
<td>162 Introduction to Social Sciences in Design</td>
<td>2</td>
</tr>
<tr>
<td>192 Drawing II</td>
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<tr>
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Second Year

<table>
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<tr>
<th>Fall Term</th>
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<tbody>
<tr>
<td>201 Design III</td>
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<tr>
<td>221 Mathematical Techniques</td>
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</tr>
<tr>
<td>231 Architectural Elements and Principles</td>
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<tr>
<td>262 Building Technology, Materials, and Methods</td>
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<tr>
<td>Out-of-college elective</td>
<td>17</td>
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<table>
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<tr>
<th>Spring Term</th>
<th>Credits</th>
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<tbody>
<tr>
<td>202 Design IV</td>
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<tr>
<td>222 Structural Concepts</td>
<td>4</td>
</tr>
<tr>
<td>232 Design Methods and Programming</td>
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</tr>
<tr>
<td>261 Environmental Controls—Site Planning</td>
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<td>College elective</td>
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<td><strong>Total credits</strong></td>
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Third Year

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<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>301 Design V</td>
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<tr>
<td>321 Structural Systems I</td>
<td>3</td>
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<tr>
<td>361 Environmental Controls—Lighting and Acoustics</td>
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<tr>
<td>Out-of-college elective</td>
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<tr>
<td>Departmental elective</td>
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<tr>
<td><strong>Total credits</strong></td>
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<table>
<thead>
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<th>Spring Term</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>302 Design VI</td>
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<tr>
<td>322 Structural Systems II</td>
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<tr>
<td>362 Environmental Controls—Mechanical and Passive Solar Systems</td>
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<tr>
<td>Out-of-college elective</td>
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<tr>
<td>Departmental elective</td>
<td>3</td>
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<tr>
<td><strong>Total credits</strong></td>
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Fourth Year

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
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<tbody>
<tr>
<td>401 Design VII</td>
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</tr>
<tr>
<td>481 Professional Practice</td>
<td>3</td>
</tr>
<tr>
<td>Out-of-college elective</td>
<td>3</td>
</tr>
<tr>
<td>College elective</td>
<td>3</td>
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<tr>
<td>Departmental elective</td>
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<tr>
<td><strong>Total credits</strong></td>
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<table>
<thead>
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<th>Spring Term</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>402 Design VIII</td>
<td>6</td>
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<tr>
<td>Out-of-college elective</td>
<td>3</td>
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<tr>
<td>College or out-of-college elective</td>
<td>3</td>
</tr>
<tr>
<td>Departmental elective</td>
<td>3</td>
</tr>
<tr>
<td>College elective</td>
<td>3</td>
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<tr>
<td><strong>Total credits</strong></td>
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</table>

Fifth Year

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>501 Design IX</td>
<td>6</td>
</tr>
<tr>
<td>or 505 Design IX—Thesis I</td>
<td>8</td>
</tr>
<tr>
<td>or 601 Special Program</td>
<td>9</td>
</tr>
<tr>
<td>510 Thesis Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Out-of-college elective</td>
<td>3</td>
</tr>
<tr>
<td>Departmental elective</td>
<td>3</td>
</tr>
<tr>
<td>Out-of-college elective</td>
<td>3</td>
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<tr>
<td><strong>Total credits</strong></td>
<td><strong>18, 20, 21</strong></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Spring Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>502 Design X—Thesis</td>
<td>8</td>
</tr>
<tr>
<td>or 504 Design X—Thesis II</td>
<td>8</td>
</tr>
<tr>
<td>or 602 or 604 Special Program</td>
<td>9</td>
</tr>
<tr>
<td>College or out-of-college electives</td>
<td>6</td>
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<tr>
<td>(two courses)</td>
<td>6</td>
</tr>
<tr>
<td>Departmental elective</td>
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<tr>
<td><strong>Total credits</strong></td>
<td><strong>17 or 18</strong></td>
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<tr>
<td><strong>Total credits</strong></td>
<td><strong>178</strong></td>
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</table>

Elective Distribution Requirements

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<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>Departmental electives</td>
</tr>
<tr>
<td>College or out-of-college electives</td>
</tr>
<tr>
<td>College electives</td>
</tr>
<tr>
<td>Out-of-college electives</td>
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<tr>
<td><strong>Total electives</strong></td>
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</table>

Departmental Elective Distribution Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of architecture courses</td>
</tr>
<tr>
<td>Principles, theories, and methods, and nonsequence design courses</td>
</tr>
<tr>
<td>Design communication, any art or computer graphics course</td>
</tr>
<tr>
<td>Architectural science course</td>
</tr>
</tbody>
</table>

College Elective Distribution Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two art courses, including a course in sculpture</td>
</tr>
<tr>
<td>Planning course</td>
</tr>
<tr>
<td>Out-of-College Elective Distribution Requirements</td>
</tr>
</tbody>
</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-term design sequence. Since this sequence may be accelerated by attending summer terms, seven or eight regular terms and two or three summer terms are typically required.

For those who would benefit from an opportunity to explore the field of architecture before deciding on a commitment to professional education, the department offers an introductory summer program that includes an introductory studio in architectural design, lectures, and other experiences designed to acquaint the participants with opportunities, issues, and methods in the field of architecture.

Admission is offered to a limited number of transfer applicants who have completed a portion of their architecture studies in other schools. Each applicant’s case is considered individually. Transfer students must complete a minimum of 70 credits and four terms in residence, taking 35 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.

Nonprofessional Alternative Program

After completing the first four years of requirements, the student may choose to receive the nonprofessional degree of Bachelor of Fine Arts (B.F.A.) in architecture.

The first two years of the professional program are considered a basic introduction to the field. It is possible to follow this phase to depart from the professional program and to develop a concentration in some area of the broader field without the intention of becoming a licensed practicing architect. A student choosing an undergraduate nonprofessional major
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.

A program developing a major concentration in the third and fourth years, leading to the nonprofessional Bachelor of Science degree in history of architecture and urban development, is available. A student attaining this degree can either terminate studies or apply to a graduate program in that area of concentration.

History of Architecture and Urban Development

The major in history of architecture and urban development is intended for undergraduate students interested in historical studies of architecture and planning offered in the context of a professional school. The program benefits from a tradition of pioneer work in the history of architecture and urban development that has grown at Cornell for several decades. Special features of the major are the availability of work in city and regional planning, and in preservation planning. Sixteen members of the college faculty offer courses appropriate for this major.

Admission to the major. Architectural history and urban development may be elected as a major if a student has completed Architecture 181 and 182 with a grade of B or better. Other students must petition for admission to the major.

Requirements. To satisfy the major subject requirement, a minimum of 40 credits of history course work must be completed with a grade of C or better. Of these 40 credits, 26 must be in architectural history and urban development, with 8 of these 26 credits obtained in courses above the intermediate level. In addition, 8 credits must be taken in related fields such as history of art; archaeology; intellectual, cultural, or political history; and history of science.

Majors will be expected to meet the language requirement in the manner specified for students enrolled in the College of Arts and Sciences.

Honors program. Students who want to enroll in the honors program must indicate their intention in writing before the end of their junior year and be accepted for the program by the history of architecture faculty. Minimum requirements for admission to candidacy for honors are:

1) a cumulative average of B- or better in all courses
2) a cumulative average of B or better in all history of architecture and urban development courses.

Honors candidates will take a 4-credit research course in the fall of their senior year. In the spring there will be a 4-credit session during which they will prepare and defend an architectural history presentation or demonstration, or a paper approximately fifty pages long.

Curriculum. Students must have already completed the first two years of the Bachelor of Architecture curriculum, for a total of 70 credits.

Third Year

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine art elective</td>
<td>3</td>
</tr>
<tr>
<td>Related field courses</td>
<td>4</td>
</tr>
<tr>
<td>History of architecture (intermediate level) or history of urban development</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Spring Term</td>
<td></td>
</tr>
<tr>
<td>Related field courses</td>
<td>4</td>
</tr>
<tr>
<td>History of architecture (intermediate level) or history of urban development</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>16</td>
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</tbody>
</table>

Fourth Year

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of architecture (advanced level) or history or urban development</td>
<td>4</td>
</tr>
<tr>
<td>Honors or history-related subject</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

| Spring Term | |
| History of architecture (advanced level) or history of urban development | 4 |
| Honors or history-related subject | 4 |
| Electives | 7 |

Students complete a total of 132 credits.

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 are offered at second-, through fifth-year levels in Ithaca. Normally, there is also a design program abroad for third-, fourth-, and fifth-year students. Registration is limited to students in good standing who have completed the sophomore year of study. In exceptional cases, a student who has completed only one year of study may be allowed to register.

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 residence 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

A studio fee of $10 is charged each semester for every design course.

Sequence Courses

101 Design I  Fall. 6 credits. Limited to department students.

Studios and lecs, M W F 2–6. Staff.

An introduction to design as a conceptual discipline directed at the analysis, interpretation, synthesis, and transformation of the physical environment. Exercises are aimed at developing an understanding of the issues, elements, and processes of environmental design.

102 Design II  Spring. 6 credits. Limited to department students. A continuation of Architecture 101.

Studios and lecs, M W F 2–6. Staff.

Human, social, technical, and aesthetic factors related to space and form. Design problems range from those of the immediate environment of the individual to that of small social groups.

201–202 Design III and IV  Fall and spring. 6 credits each term. Coregregation in Architecture 231–232 required. Limited to department students. Studios and sesns, M W F 2–6. Staff.

301–302 Design V and VI  Fall and spring. 6 credits each term. Limited to department students.

Studios and sesns, M W F 2–6. Staff.

401–402 Design VII and VIII  Fall and spring. 6 credits each term. Limited to department students.

Studios and sesns, M W F 2–6. Staff.

Programs in architectural design, urban design, or architectural technology and environmental science are offered each term.

501 Design IX  Fall or spring. 6 credits. Limited to department students.

Studios, M W F 2–6. Staff.

502 Design X—Thesis  Fall or spring. 8 credits.

Prerequisite: Architecture 510. Required of B.Arch candidates, who must satisfactorily complete a thesis during one term of their last year in residence. Students accepted for admission to the Overlap Program are exempt from the thesis requirement. Studios, M W F 2–6. Staff.

503–504 Design IX—Thesis I, and Design X—Thesis II  Fall or spring. 8 credits each term.

Prerequisite: permission of department.

Studios, M W F 2–6. Staff.

Students who have obtained approval may elect to spend two terms working on the thesis.

510 Thesis Introduction  Fall or spring. 3 credits.

Required of all architecture students in the year preceding work on their thesis.

Lec and sesns, R 1:25–4:25. Staff.

Lectures, seminars, and independent research leading to complete development of the student's thesis program. General instruction in the definition, programming, and development of a thesis is followed by tutorial work with the student's advisory committee.

601–602 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.

Elective Design Courses

111–112 Elective Design Studio 111. Fall; 112. Spring. 6 credits each term. Limited to students from outside the department. Prerequisite: permission of instructor.

M W F 2–6. Staff.

200, 300, 400, 500 Elective Design  Fall or spring. 6 credits each term. Open by permission to transfer students who have not been assigned to a sequence course. Prerequisite: permission of department officer. Each student is assigned to a class of appropriate level.

M W F 2–6. Staff.

Nonsequence Courses

310 Special Problems in Architectural Design  Fall or spring. Registration and credit by arrangement. Hours to be arranged. Staff, independent study.

611–612 Urban Housing Developments 611. Fall; 612. Spring. 2 credits each term. Limited to fourth- and fifth-year students in architecture, and graduate students. Prerequisite: permission of instructor. Not offered 1983–84.

Sem. hours to be arranged. O. M. Ungers. Large-scale housing developments, particularly size, density, and problems of infrastructure.

613 Transportation  Fall. 2 credits. Prerequisite: permission of instructor. Not offered 1983–84.

Sem. hours to be arranged. P. Cohen. The impact of various transportation forms on the environment is considered from the perspectives of architects, engineers, planners, and human ecologists. Readings and discussions of past, current, and future transportation modes focus on aesthetic and physical aspects.
614  Low-Cost Housing  Fall or spring. 3 credits  Prerequisite: permission of instructor.  
Sems, hours to be arranged. F. O. Slate, H. W. Richardson.  
Aspects of low-cost housing involving engineering technology, architecture, physical planning, economics, and sociology.

[618–619  Seminar in Urban and Regional Design  618, fall, 619, spring. 3 credits each term. Limited to fifth-year and graduate students. Not offered 1983–84. Hours to be arranged. O. M. Unger, staff, and guest lecturers. A broad range of issues and problems of urban and regional development and the context in which the designer functions are surveyed. Selected case studies are presented by the participants and visitors.]

Graduate Courses

711–712  Problems in Architectural Design  Fall and spring. 9 credits each term.  
Studio and sem, hours to be arranged. W. Goehner.  
Basic first-year design course for graduate students whose major concentration is architectural design.

713–714  Problems in Urban Design  Fall and spring. 9 credits each term.  
Studio and sem, hours to be arranged. C. Rowe.  
Basic first-year design course for graduate students whose major concentration is urban design.

811  Thesis or Research in Architectural Design  Fall or spring. 9 credits.  
Hours to be arranged. W. Goehner.  
Second-year design course for graduate students whose major concentration is architectural design.

812  Thesis or Research in Urban Design  Fall or spring. 9 credits.  
Hours to be arranged. C. Rowe.  
Second-year design course for graduate students whose major concentration is urban design.

Structures Courses

002  Basic Mathematics  Fall or spring. 2 credits  
Limited to freshmen. Credits earned for this course may not be applied toward credits required for graduation.  
Hours to be arranged. F. W. Saul. A review of basic mathematics.

Sequence Courses

221  Mathematical Techniques  Fall. 3 credits.  
Lecs, T R 10:10–11:10. Rec to be arranged.  
Mathematical concepts and operations used in architecture are introduced.

222  Structural Concepts  Fall or spring. 4 credits  
Prerequisite: Architecture 221 or approved equivalent.  
Lecs and sems, T R 9:05–11:00. F. W. Saul.  
Fundamental concepts of structural behavior. Statics and strength of materials.

321  Structural Systems I  Fall. 3 credits.  
Prerequisites: Architecture 221 and 222.  

322  Structural Systems II  Spring. 3 credits.  
Prerequisite: Architecture 222.  

Nonsequence Courses

326  Building Substructure  Spring. 3 credits  
Prerequisites: Architecture 322 or concurrent registration and permission of instructor.  
Sem, hours to be arranged. F. W. Saul. The principles of soil mechanics and subsurface exploration. Design of building foundations—footings, piles, and subgrade walls.

Architectural Principles, Theories, and Methods

Sequence Courses

131  Introduction to Architecture  Fall. 2 credits  
Open to students in other colleges.  
Lec, T 3:35–5:30. Staff.  
The built and natural environments are introduced as a context for culture. Architecture as an environmental-design discipline and its relation to other fields is discussed.

231  Architectural Elements and Principles  Fall. 2 credits  
Architecture students must register concurrently in Architecture 201.  
Studios and lecs, T R 1:30–3:25. Staff.  
Theory of the order, perception, and function of architectural space. Discussion on the nature of architectural systems and the multiplicity of ways they can be used to solve architectural problems.

232  Design Methods and Programming  Spring. 2 credits.  
Architecture students must register for this course concurrently with Architecture 202.  
Studios and lecs, T R 1:30–3:25. Staff.  
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.

Nonsequence Courses

331  Special Problems in Principles, Theories, and Methods  Fall or spring. Registration and credit by arrangement with instructor.  
Hours to be arranged. Staff.  
Independent study.

333–334  Computer Graphics (also Computer Science 417–418)  333, fall; 334, spring. 4 credits.  
Prerequisites: two terms of calculus and Computer Science 211, or equivalent.  
Lecs, T R 9:05–10:00. D. P. Greenberg.  
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.

335  Theory of Architecture  Fall or spring. 3 credits each term.  
Prerequisite. Architecture 231–232 or permission of instructor.  
Lecs, T R 4:45–6:30 p.m. L. Hodgden.

Theories of modern architecture: De Stijl, cubist and purist painting, industrialized architecture, Le Corbusier's architecture and urban theories, architectural sequence, facades, the free plan, "DOM-INO" theory.]

337  Special Investigations in the Theory of Architecture  Fall or spring. Variable credit.  
Prerequisite: permission of the instructor.  
Hours to be arranged. Staff.  
Independent study.

[338  Computers in Architecture Seminar  Fall. 2 credits  
Prerequisites: Computer Science 100 or equivalent. Not offered 1983–84.  
Hours to be arranged. Staff.  
Exploration of the use of computers in a variety of ways encompassing architectural practice and education. Use of the computer is not required for this course.]

[339  Architectural Computer Applications  Spring. 3 credits  
Prerequisites: Computer Science 100 or second-year standing. Not offered 1983–84.  
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.]

431  Theory of Architecture  Fall. 3 credits.  
Prerequisite: third-year status.

Prerequisites: Architecture 334 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.

531–532  Computer-aided Structural Design  531, fall; 532, spring. 4 credits each term. Limited to fourth-year students and above.  
Prerequisites: Architecture 334 and Civil and Environmental Engineering 371–372, concurrent registration in Civil and Environmental Engineering 673, and permission of instructor. Not offered 1983–84  
D. P. Greenberg.  
Advanced topics involving interactive computer graphics and advanced structural analysis techniques.

533–534  Computer-aided Environmental Design  533, fall; 534, spring. 4 credits each term. Limited to students in their fourth or later year.  
Prerequisites: Architecture 334, 362, one year of college physics, and permission of instructor. Not offered 1983–84  
Staff.  
Advanced topics involving interactive computer graphics and advanced environmental design techniques. Topics may include acoustics, lighting, and energy analyses.

635  Critical Theory in Architecture  Fall or spring. 3 credits  
Prerequisite: permission of instructor. Not offered 1983–84.  
Hours to be arranged. Staff.  
An inquiry into the fundamental principles of architectural criticism in theory and practice, with emphasis on the philosophical problems involved.

637  Special Investigations in the Theory of Architecture II  Fall or spring. Variable credit.  
Prerequisite: permission of the instructor.  
Hours to be arranged. Staff.  
Independent study.
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.

The Baroque 3 credits Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1983–84; next offered spring 1985. Hours to be announced. M. Kubelik. History of European architecture and city planning of the fifteenth and sixteenth centuries. Special consideration is given to building types and to internal changes in architecture and urban design, as well as to external influences such as social, economic, and political factors.

The Baroque 3 credits Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1983–84; next offered spring 1985. 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.

The Nineteenth Century 3 credits Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered every year; next offered fall 1985 and spring 1986. Hours to be announced. A. Senkevitch, Jr. Examination of the leading trends in Western architectural theory and practice from the rationalist traditions through the arts-and-crafts movement.

The Twentieth Century Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Next offered fall 1985. Hours to be announced. Staff. The history, ideas, and theories of architecture and urban design in Europe and America during the course of the twentieth century, beginning with reform efforts of the 1890s and concluding with work from the 1980s.

American Architecture I Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Next offered fall 1985. Hours to be announced. A. Senkevitch, Jr. History of American architecture and urbanism from the late seventeenth century to the Civil War, with emphasis on stylistic trends, practitioners, and social and aesthetic ideals of the time.

American Architecture II Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Next offered 1985–86. Hours to be announced. A. Senkevitch, Jr. 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.

The American Planning Tradition also City and Regional Planning 462 Fall. 4 credits. Prerequisites: Architecture 181–182 or permission of instructor. A review of civic planning and urbanism from the late colonial era through 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 urban planning.

Russian Architecture Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Hours to be announced. A. Senkevitch, Jr. A survey of leading developments in Russian architecture and urbanism from the tenth to the mid-twentieth centuries, with a consideration of precedents and parallel tendencies abroad.

Special Investigations in the History of Architecture Fall or spring. Variable credit. Prerequisite: permission of instructor. Hours to be announced. Staff. Independent study for undergraduate students. May not be taken to satisfy undergraduate history requirements by students in design.

Special Topics in Architectural History Spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1983–84; next offered 1985–86. Hours to be announced. M. Kubelik. Topic to be announced by preregistration.

Special Topics in Architectural History Fall. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Not offered 1983–84; next offered 1984–85. Hours to be announced. C. F. Otto. Topic to be announced by preregistration.

Special Topics in Architectural History Fall or spring. 3 credits. Limited to 30 students. Prerequisites: Architecture 181–182 or permission of instructor. Hours to be announced. Staff. Topic to be announced by preregistration.

Courses in Preservation

Methods of Archival Research (also City and Regional Planning 481) Spring. 3 credits. 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.

Measured Drawing Fall. 3 credits. For undergraduate architecture students and graduate students in history and preservation. Prerequisite: permission of instructor. Hours to be announced. M. A. Tomlan. Combines study of architectural drawings as historical documents with exercises in preparing measured drawings of small buildings. Presents the basic techniques of studying, sketching, and measuring a building and the preparation of a finished drawing for publication.

Problems in Contemporary Preservation Practice (also City and Regional Planning 563) Fall or spring. Variable credit. Hours to be announced. S. W. Stein, M. A. Tomlan, T. Werbkzy. A review and critique of ongoing preservation projects and an investigation of areas of expertise currently being developed, presented by staff and guest lecturers.

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 existing cultural and aesthetic resources in the planning and design of regions and cities.

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.

547 Building Materials Conservation (also City and Regional Planning 564) Spring 3 credits
Open to juniors, seniors, and graduate students.
Hours to be announced. 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.

548 Historic Preservation Planning Workshop: Surveys and Analyses (also City and Regional Planning 561) Fall and spring 4 credits
Hours to be announced. T. Werbelzky
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 hands-on experience with local communities and 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 386 or permission of instructor.
Hours to be announced. Staff
Special topics in the history of 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. A. Senkevitch, Jr.
Historical topics 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 398 or permission of instructor.
Hours to be announced. Staff
Special topics in the history of 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. A. Senkevitch, Jr.
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 650) 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 history, its relations to other disciplines, sources of written and graphic materials, and the uses of historical evidence in interpreting urban planning and development.

694 Seminar in Russian Architecture Fall or spring. 4 credits. Prerequisites: Architecture 394 or permission of instructor.
Hours to be announced. A. Senkevitch, Jr.
Historical topics in Russian architecture and urbanism. Specific subject to be announced.

696 Seminar in the History of Architecture and Urban Development Fall or spring. 4 credits. Prerequisites: permission of the 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. Prerequisite: permission of instructor.
Hours to be announced. Staff
Topic to be announced.

700 Informal Study in the History of Architecture and Urban Development Fall or spring. Variable credit. Prerequisites: permission of the instructor.
Hours to be announced. Staff
Independent study for graduate students.

890 Thesis in Architectural History Fall or spring. Variable credit.
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.

Design Communication Courses

151 Design Fundamentals I Fall. 2 credits. Studio and lec, R 2–6. Staff
Fundamentals of visual and conceptual organization. Dynamics of perception; spatial organization and its representation. Demonstrative problems of an analytic and conceptual nature.

152 Design Fundamentals II Spring. 2 credits. Studio and lec, R 2–6. Staff
Theory of visual and conceptual organization, spatial perception, spatial organization and its representation; demonstrative problems of an analytic and conceptual nature.

Nonsequence Courses
Note: Darkroom fees for all photography courses (these fees are subject to change):
In-college students—$45 per term
Out-of-college students—$45 plus $10 per term course fee

251 Introductory Photo I (also Art 161 or 162) Fall or spring. 3 credits each term.
Hours to be arranged. Staff
For course description, see Art 161–162.

351 Introductory Photo II (also Art 261 or 262) Spring. 3 credits. Prerequisites: Architecture 251 or Art 161 or 162, or permission of instructor.
Hours to be arranged. Staff
For course description, see Art 261–262.

[353 Large-Format Architectural Photography Spring. 3 credits. Prerequisites: Architecture 261 or Art 161–162, 261–262, or permission of instructor.
Darkroom fee. $30. Not offered 1983–84
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.]

356 Graphic Design Studio Fall or spring. 3 credits. Prerequisite: Architecture 151, 152, or permission of instructor.
Lec and studio, hours to be arranged. Staff
Design and preparation of materials for reproduction in print media. Staff.

[358 Architectural Simulation Techniques Spring. 3 credits. Prerequisite: Architecture 151 or permission of instructor. Not offered 1983–84.
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. Prerequisites: written proposal outlining the special project and permission of instructor.
Hours to be arranged. Staff
Independent study.

458 Special Project in Design Communication Fall or spring. Variable credit. Limited to undergraduates. Prerequisite: written proposal outlining the special project and permission of instructor.
Hours to be arranged. Staff
Independent study. Students taking course for photography credit pay darkroom fee.

Architectural Science and Technology Courses

Sequence Courses

162 Introduction to Social Sciences in Design Spring. 2 credits.
Lecs. M W F 9:05. B. MacDougall
An introduction to concepts and methods in the social sciences for architects; how approaches from anthropology, environmental psychology, and sociology can be used in the study and design of the built environment.

261 Environmental Controls—Site Planning Fall or spring. 3 credits.
The basic principles involved in design in the outdoor environment. A brief historical perspective including Italian, French, and Japanese prototypes. A development of inventory, design, and graphic communication tools and conventions. Grading, runoff, and planting design. Special attention is placed on the design of the microclimate.

262 Building Technology, Materials, and Methods Fall or 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.

82 Architecture, Art, and Planning
The Profession of Architecture

Sequences Courses

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.

Architectural Drawing

191 Drawing I Fall, 2 credits.
   Studios, T R 9:05–11, Staff.
   Freehand drawing with emphasis on line and perspective representation of form and space.

192 Drawing II Spring, 2 credits. Prerequisite: Architecture 191.
   Studios, T R 9:05–11, Staff.
   Freehand drawing as a means of conceiving and expressing spatial form, line weight, shades and shadows, and figure drawing.

Art


Undergraduate Program

The undergraduate curriculum in art, leading to the degree of Bachelor of Fine Arts, provides an opportunity for the student to combine a general liberal education with the studio concentration required for a professional degree. During the first three semesters, all students follow a common course of study designed to provide a broad introduction to the arts and a basis for the intensive studio experience in the last three years. Beginning with the fourth term, students concentrate on painting, sculpture, photography, or printmaking. They may elect additional studio work in any of these subjects during the last two years, with the consent of the instructor, providing the courses are taken in sequence and at the hours scheduled. These courses are designed to promote a knowledge and critical understanding of these arts and to develop the individual student’s talent. All members of the faculty in the Department of Art are active, practicing artists, whose work represents a broad range of expression.

Studio courses occupy approximately one-half of the student’s time during the four years at Cornell; the remainder is devoted to a diversified program of academic subjects with a generous provision for electives.

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 city planning is a source of special strength in the Cornell program and affords unusual benefits to the students in these three disciplines.

Although 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, no specific technical courses are offered in such areas as interior design, fashion, or commercial art.

The department discourages accelerated graduation. However, a student may petition for consideration of early graduation upon 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 advisor 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.

Curriculum

First Year

Fall Term

Credits

110 Color, Form, and Space

3

111 Introductory Art Seminar

1

121 Introductory Painting

3

141 Introductory Sculpture

3

151 Introductory Drawing

3

Elective

3

minimum 16

Spring Term

One of the following:

132 Introductory Etching

3

134 Introductory Graphics

3

136 Introductory Lithography

3

152 Introductory Drawing

3

162 Introductory Photography

3

Art history elective

3

Elective

3

minimum 15

Second Year

Fall Term

Credits

251 Second-Year Drawing

3

100- or 200-level studio courses* 6

Art history elective

3

Elective

3

minimum 15

Spring Term

252 Second-Year Drawing

3

100- or 200-level studio courses* 6

Art history elective

3

Elective

3

minimum 15

Third Year

Fall Term

Credits

Third-year studio concentration

4

Studio elective

2

311 Issues of Contemporary Art

3

Electives

6

minimum 15

Spring Term

Either third-year studio or independent studio or both

Art history elective

4

Electives

6

minimum 16

Fourth Year

Fall Term

4

Fourth-year studio concentration

6

Art history elective

4

Electives

6

minimum 16

Spring Term

Senior thesis studio concentration

6

Art history elective

4

Electives

6

minimum 16

*Students must complete one course each in painting, sculpture, printmaking, and photography during the second year.
Third and fourth years. Students in the third and fourth years should plan their programs to complete 30 credits in courses in one of the following studio areas: painting, sculpture, printmaking, or photography. Or they should plan to complete 20 credits in each of two of the above areas. An additional 12 credits in history of art at the 200 level or higher or in architectural history must also be completed. Students are required to participate in Senior Exhibition.

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. With these guidelines, students may design their own 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. The following courses in the Department of History of Art must be completed: 220, The Classical World; 230, Monuments of Medieval Art; 240, The Renaissance; 261, Modern Art. Three of the following should be taken: History of Art 250, 270, 280, 290, 322, 323, 328, 341, 343, 344, 345, 352, 355, 357, 361, 362, 364, 365, 376, 379, 380, 381, 383, 384, 385, 386; Architecture (history) at the 100, 200, 300 or 400 level.

2) Of the minimum of 64 credits to be taken within the Department of Art, the following courses must be completed in the first two years: 110, 111, 121, 141, 151, 152, 162, 221 or 222, 241 or 242, 251 or 252. One of the following photography courses must be completed in the second year: 261, 262, 263, 264, 265, 266, 267, 268. In addition, two of the following courses in the printmaking area must be completed in the first two years: 131, 132, 133, 134, 135, 136, 139, 141, 231, 232, 233, 234, 235, 236.

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.

Course Information

Most courses in the Department of Art are open to students in any college of the University who have fulfilled the prerequisites and who have permission of the instructor.

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.

Courses in Theory and Criticism

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.


84 Architecture, Art, and Planning

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 Art 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

121–122 Introductory Painting 121, fall or summer; 122, spring. 3 credits each term. Hours to be arranged. Staff. 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.

135–136 Introductory Lithography 135, fall; 136, spring. 3 credits each term. 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.

231–232 Second-Year Intaglio Printing 231, fall; 232, spring. 3 credits each term. Prerequisite: Art 131 or 132 or permission of instructor. Hours to be arranged. E. Meyer. Continuation of the study and practice of methods of intaglio printing, with emphasis on techniques and color.

233–234 Second-Year Silk-Screen Printing 233, fall; 234, spring. 3 credits each term. Prerequisite: Art 133 or 134 or permission of instructor.

Hours to be arranged. S. Poleskie. Continuation of silk-screen printing, including photographic stencils, three-dimensional printing, and printing on metal, plastic, and textiles.

235–236 Second-Year Lithography 235, fall; 236, spring. 3 credits each term. Prerequisite: Art 135 or 136 or permission of instructor.

Hours to be arranged. G. Page. Continuation of the study and practice of planographic printing, with emphasis on color.

331 Third-Year Printmaking Fall. 4 credits. Prerequisite: 9 credits of course work in an area of specialization (intaglio, lithography, or silk-screen printing) 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 Third-Year Printmaking Spring. 4 credits. Prerequisite: Art 331 or permission of instructor. Hours to be arranged. Staff. Continuation and expansion of Art 331.

431 Fourth-Year Printmaking Fall. 6 credits. Prerequisite: Art 431 or permission of instructor. Hours to be arranged. Staff. Further study of the art of printing through both assigned and independent projects executed in various media. Instruction through group discussions and individual criticism.

422 Senior Thesis in Painting Spring. 6 credits. Prerequisite: Art 421 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, fall; 722 and 822, spring. Credit as assigned. May be repeated for credit. Limited to M.F.A. students in painting.

Staff. Students are responsible, under staff direction, for planning their own projects and selecting the media in which they are to work. All members of the staff are available for individual consultation.

Studio Courses in Graphic Arts

131–132 Introductory Intaglio Printing 131, fall; 132, spring or summer. 3 credits each term. Hours to be arranged. E. Meyer. A basic introduction to etching techniques, with emphasis on engraving, lift ground, relief printing, monotypes, and experimental techniques.

133–134 Introductory Graphics 133, fall; 134, spring. 3 credits each term. Hours to be arranged. S. Poleskie.
Studio Course in Sculpture

141–142  Introductory Sculpture  141, fall or summer; 142, spring; 3 credits each term.  
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.

241–242  Second-Year Sculpture  241, fall; 242, spring; 3 credits each term.  Prerequisites: nonmajors, none; majors, Art 141 or 142 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  Third-Year Sculpture  Fall, 4 credits  
Prerequisite: Art 242 or permission of instructor.  
Hours to be arranged.  Staff.  
Continued study of the principles of sculpture in the selection and expressive use of materials and media. Group discussions and individual criticism.

342  Third-Year Sculpture  Spring, 4 credits.  
Prerequisite: Art 341 or permission of instructor.  
Hours to be arranged.  Staff.  
Continuation and expansion of Art 341.

441  Fourth-Year Sculpture  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.

442  Senior Thesis in Sculpture  Spring, 6 credits  
Prerequisite: Art 441 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

Note: Darkroom fees for all photography courses (these fees are subject to change):  
In-college students—$45 per term  
Out-of-college students—$45 plus $10 per term course fee.

161–162  Introductory Photo I (also Architecture 251)  161, fall or summer; 162, spring; 3 credits each term.  Darkroom fee $45 (may increase).  
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.

261–262  Introductory Photo II (262 is also Architecture 351)  261, fall; 262, spring; 3 credits.  
Prerequisites: Art 161 or 162, Architecture 251 or 252, or permission of instructor. Darkroom fee $45 (may increase).  
Hours to be arranged.  Staff.  
A continuation of Introductory Photo I.

263–264  Color Photo I  263, fall; 264, spring; 3 credits each term.  Prerequisite: Art 161 or 162 or permission of instructor. Darkroom fee $45 (may increase). Not offered spring 1984.  
Hours to be arranged.  S. Bowman.  
A studio course in color photographic processes, including color film developing and color printing. Emphasis is on camera skill, color techniques, image content, and creative use of color photography.

265–266  Color Photo II  265, fall; 266, spring; 3 credits each term.  Prerequisite: Art 263 or 264 or permission of instructor. Darkroom fee $45 (may increase). Not offered fall 1983–84.  
Hours to be arranged.  S. Bowman.  
A continuation of Color Photo I.

267–268  Photo Processes  267, fall; 268, spring; 3 credits each term.  Prerequisite: Art 161 or 162 or permission of instructor. Darkroom fee $45 (may increase). Not offered fall 1983.  
Hours to be arranged.  J. Lacey  
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.

269  Large-Format Photography  Fall, 3 credits  
Prerequisite: Art 161 or 162 or permission of instructor. Darkroom fee $45 (may increase). Not offered 1983–84.  
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.

361–362  Third-Year Photography  361, fall; 362, spring; 4 credits each term.  A studio course intended for photography majors and other qualified students. Prerequisite: One 200-level photography course or permission of instructor.  
Hours to be arranged.  Staff.  
Continued study of creative use of photography, with emphasis upon specialized individual projects.

461 Fourth-Year Photography  Fall, 6 credits.  
Prerequisite: three semesters of photography or permission of instructor. Darkroom fee, $45 (may increase).  
Hours to be arranged.  J. Lacey  
A studio course intended for photography majors and other qualified students.

462  Senior Thesis in Photography  Spring, 6 credits.  
Prerequisite: Art 461 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.  
Staff.

Studio Courses in Drawing

Note: Darkroom fees for all photography courses (these fees are subject to change):  
In-college students—$45 per term  
Out-of-college students—$45 plus $10 per term course fee.

151–152  First-Year Drawing  151, fall or summer; 152, spring; 3 credits each term.  
Hours to be arranged.  Staff.  
A basic drawing course in the study of form and techniques. Contemporary and historical examples of figures are analyzed in discussion.

251–252  Second-Year Drawing  251, fall; 252, spring; 3 credits each term.  Prerequisites: Art 151 or 152, or permission of instructor.  
Hours to be arranged.  Staff.  
A continuation of Art 151, but with a closer analysis of the structure of the figure and a wider exploitation of its purely pictorial qualities.

351  Third-Year Drawing  Fall, 3 credits  
Prerequisites: Art 151, 152, 251, and 252. Not offered 1983–84.  
Staff.

Graduate Thesis

712  Graduate Thesis  Spring.  Credit as assigned.  Staff.  
For graduate students in their last term in the programs in painting, sculpture, and graphics.

Special Studio Courses

370  Independent Studio in Painting  Fall or spring.  Credit as assigned up to 5 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in painting.

371  Independent Studio in Sculpture  Fall or spring.  Credit as assigned up to 5 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in sculpture.

372  Independent Studio in Printmaking  Fall or spring.  Credit as assigned up to 5 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in printmaking.

373  Independent Studio in Photography  Fall or spring.  Credit as assigned up to 5 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in photography.

374  Independent Studio in Drawing  Fall or spring.  Credit as assigned up to 5 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in drawing.

470  Independent Studio in Painting  Fall or spring.  Credit as assigned up to 6 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in painting.

471  Independent Studio in Sculpture  Fall or spring.  Credit as assigned up to 6 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in sculpture.

472  Independent Studio in Printmaking  Fall or spring.  Credit as assigned up to 6 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in printmaking.

473  Independent Studio in Photography  Fall or spring.  Credit as assigned up to 6 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in photography.

474  Independent Studio in Drawing  Fall or spring.  Credit as assigned up to 6 credits; may be repeated for credit. Prerequisite: written permission of instructor.  
Hours to be arranged.  Staff.  
Advanced studio concentration in drawing.
City and Regional Planning


The department offers programs of study at both the undergraduate and graduate levels. The undergraduate degree program is focused on urban and regional studies. The graduate program is focused on urban and regional planning.

The Undergraduate Program in Urban and Regional Studies

The program offers students completing their first two years in areas of study such as social sciences, design, the humanities, engineering, and other fields an opportunity to transfer and redirect their education toward an understanding of the various social, political, economic, and environmental issues facing cities and regions. The focus of study is primarily academic rather than professional. The curriculum is designed to develop an understanding of the complex process of urbanization that characterizes modern society, and the various forces that most affect the growth or decline of cities and regions. For further information, students should consult the director of the Urban and Regional Studies Program, 106 West Sibley Hall.

The Graduate Program in City and Regional Planning

Planning seeks to guide the development of the economic, social, natural, and built environment 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 clearly a considerable overlap among these three areas of professional and scholarly study, and the department encourages the integration of related planning activities.

Urban planning is generally concerned with the urban environment, the physical facilities as well as social and economic forces that affect this environment, and the processes of urban plan making and administration.

Regional planning is usually concerned with socioeconomic 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 in regional development.

Social-policy planning is generally concerned with the social decision processes involved in both city and regional planning.

International planning is an additional area in which the department offers a range of courses and activities that involve United States citizens and foreign nationals.

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 courses. Undergraduate upperclass 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

400 Introduction to Urban and Regional Theory Fall. 4 credits. Open to juniors and seniors. T 2:30–5:30. Staff. A review of the 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.

Spring. 4 credits. Prerequisite: CRP 500. Staff. An examination of contemporary social and economic conditions of neighborhoods; community organization, and the political environment will be explored.

510 Introduction to Planning Theory Fall. 4 credits. Credit as assigned. 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.

511 Concepts and Issues in Planning Practice Fall or spring. Credit as assigned. Staff.

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.

512 Special Topics in Urban and Regional Theory Fall or spring. Credit as assigned. Staff.

801 Advanced Seminar in Urban and Regional Theory I Fall. 3 credits. Prerequisite: CRP 500. 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. 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.

802 Advanced Seminar in Urban and Regional Theory II Fall 3 credits. Prerequisite: CRP 500. M 3:35–5:30. B. G. Jones. A continuation of City and Regional Planning 800, concentrating on recent developments.

86 Architecture, Art, and Planning
and practice, community control; and the role of the community in the provision of goods, services, and social support.

710 Politics of the Planning Process  Spring  4 credits.
W 2:30–4:25. P. Clavel
Analysis of planning and political institutions in selected subjects and policy areas, relating national and subnational levels. Subjects are drawn from such areas as environmental control and use policy, industrial development, transportation, and community development. Theories of planning and politics are compared for their analytical usefulness in these areas.

711 Planning and Organization Theory  Fall  4 credits.
R 3:35–5:30. P. Clavel
An examination of organizational and administrative models relevant to plan formation and implementation. Applications are made to such programs as community development, regional administration, urban renewal, and land-use control.

718 Fieldwork or Workshop in Planning Theory and Politics  Fall or spring. 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.

Quantitative Methods and Systems Analysis

320 Introduction to Quantitative Methods I  Fall  3 credits.
Staff.
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.
Staff.
A continuation of City and Regional Planning 320.

520 Mathematical Concepts for Planning  Fall–spring  4 credits. Prerequisite: permission of instructor.
Mathematics 201 and Sociology 240 are acceptable substitutes for this course.
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/I or another appropriate programming language. Brief introduction to computer systems and the use of library routines. Advantages and limitations of using computers are considered.

520 Planning Analysis  Spring  4 credits. Prerequisite: CRP 621.
A survey of commonly used techniques for analyzing various aspects of subnational socioeconomic systems, emphasizing planning applications.

623 Methods of Social Policy Planning  Spring  3 credits. Prerequisite: CRP 521 or equivalent.
Staff.
An examination of methodologies of needs assessment, programming, and evaluation suitable for social planning problems. Many of the methodologies, survey research, social area analysis, and social indicators have been drawn from other social science disciplines but are applied to policy and planning issues. Others, such as needs assessment, social impact assessment, goal attainment, PPBS, and PERT were developed directly or were adapted for use in social planning.

624 Statistical Analysis for Planning I  Fall  3 credits. Prerequisites: CRP 520 or equivalent and permission of instructor.
Staff.
An introduction to basic methods of statistical analysis with an emphasis on their use in the decision-making process in planning. Material in decision theory, regression, hypotheses testing, and prediction will be introduced.

625 Statistical Analysis for Planning II  Spring  3 credits. Prerequisite: CRP 624.
Staff.
Continuation of CRP 624.

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. Prerequisites: CRP 621 and 521 or equivalent. Not offered 1983–84.
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.

D. Lewis.
An examination of selected techniques for analyzing complex 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.
Staff.
Work on applied systems planning problems in a field or laboratory setting or both.

729 Special Topics in Quantitative Methods and Analysis  Fall or spring. Credit as assigned.
Staff.

Regional Development Planning

[530 Introduction to Regional Development Planning  Fall. 3 credits. Prerequisite: CRP 500. Not offered 1983–84.
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 Regional Development Administration  Fall or spring. 4 credits. Not offered 1983–84.
An analysis of institutional aspects of the field of regional development planning. Methods and techniques, as well as regional development policies, are under consideration.

730 Methods of Regional Science  Fall  4 credits.
Prerequisites: basic economics and elementary calculus.
R 10:10–12:05, plus optional workshops.
S. Czamanski.
Main quantitative techniques used in regional planning are covered. Since many methods have multiple applications in planning, the topics are organized around three broad subjects: population and migration studies, regional economic analysis, and interindustry relations.

731 Optimization Techniques in Planning  Spring  4 credits.
Prerequisites: basic economics, elementary calculus, and matrix algebra.
T 10:10–12:05, plus optional workshops.
S. Czamanski.
Typology of plans and planning models. Static optimization techniques, especially linear programming, integer and quadratic programming, optimization under competition, and multiobjective planning are discussed in the context of applications to land-use, location of public facilities, and regional development. Dynamic systems, including basic control theory, and introduction to dynamic programming with applications to regional growth and migration policies. Economic theory of socialism. Elements of calculus of variations and of geometry of vector spaces are covered in optional workshops.

732 Regional Industrial Development  Fall  4 credits.
Prerequisites: basic economics and elementary calculus.
W 10:10–12:05, plus optional workshops.
S. Czamanski.
The course focuses on issues of industrial, as distinct from agricultural or regional, development. Material includes theory of production, elements of growth theory, interindustry relations and formation 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.
382 Location Theory in Physical and Policy Spaces Fall or spring. 3 credits. Prerequisites: CRP 500 and 620 and Economics 311–312, or equivalent. A. 7–10 p.m. W. Isard. This course is an introduction to the study of the location of objects in space. It investigates the factors that influence the location of activities and the implications of location for planning and decision making.

383 Conflict Management in Multiregion Planning Spring. 3 credits. W. Isard. This course focuses on the analysis of conflicts among policy makers in multiregion situations. Particular emphasis is given to conflicting objectives among different interest groups, regions, and nations, and diverse procedures to resolve conflicts.

389 Informal Study in Regional Development Planning Fall or spring. Credit as assigned. Staff. This course is an exploration of informal study in regional development planning.

Social Policy Planning

340 Institutional Decision Processes Fall. Credit as assigned. W. 2:30–4:25. Staff. This course introduces the administrative and political environment in which urban and regional issues occur. Starting from an analysis of decision-making processes, the course then goes on to describe the characteristics of administrative and political institutions in urban settings. The functions of urban and regional problems taking place in an urban community are also examined. The students are given an understanding of the 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) Cosponsored by the Program on Science, Technology, and Society. Spring. 4 credits. T. R 2:30–4:25. Staff. This course examines the impact and control of technological change in the context of present policies and strategies of control. Several specific cases are considered in detail, followed by an 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. Staff. A view of science less as an autonomous activity than as a social and political institution. Focus is on its relationship to government, the media, religion, and education. Different contemporary controversies, questions of ethics and social responsibility in science, struggles to maintain internal control over research and the teaching of science, and concepts of the limits of inquiry are discussed.

540 Introduction to Social Policy Planning Fall. 4 credits. Not offered 1983–84. Staff. This course introduces students to 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 reorganization, and political movements to limit spending, such as Proposition 13, and (3) an exploration of new forms or alternatives to the existing service delivery systems.

541 The Politics of Technical Decisions I (also Government 628 and B & PA NPA 516) Cosponsored by the Program on Science, Technology, and Society. Fall. 4 credits. W. 2:30–4:25. Staff. Political aspects of decision making in areas traditionally regarded as technical. Subjects include 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 and B & PA NPA 516) Cosponsored by the Program on Science, Technology, and Society. Spring. 4 credits. Prerequisite: CRP 541 or permission of instructors. Hours to be arranged. Staff. A continuation of City and Regional Planning 541, focusing on decision making in several technical policy areas. Students develop individual or group research projects focusing on policy decisions with a significant technical component and considerable public impact.

543 Planning, Organizing, and Public Service Delivery Fall or spring. Credit as assigned. R. 10:10–12:05. J. Forester. An exploration of planners' roles with special attention to organizational and political contexts of planning and policy analysis efforts. Focus is on communicative and organizational behavior and planning practice; planning is assessed as an organizing activity extending far beyond technical problem solving.

544 Dynamics of Social Policy Institutions Spring. Credit as assigned. J. Forester. Reinvestigating social policy themes studied: professional power and creation of dependency, political and technical aspects of expertise, organizational and institutional settings of social policy programs and services, problems of professional altruism in service delivery.

642 Critical Theory and the Foundation of Planning Analysis Fall. Credit as assigned. M. 10:10–12:05. J. Forester. Survey of critical social science. A study of critical social science from the Enlightenment to the present. The course is designed for persons interested in professional careers that will involve working in or with public agencies.

643 Legal Aspects of Public Administration Fall. 3 credits. M. W. F. 11:15–12:20. B. Booth. Examination of the legal aspects of public administration, including, for example, agency rules, job protection, and the protection of citizens' rights in administrative processes, and judicial review of agency decisions. This course is not open to persons interested in professional careers that will involve working in or with public agencies.

740 Seminar in Social Policy Research and Analysis Spring. 4 credits. Staff. Focuses on examining contemporary methods of social policy analysis, including their theoretical implications, and developing multidisciplinary approaches to selected social policy issues. The dilemmas of action research and of implementing research findings are explored.

743 Critical Theory and Public Policy Spring. 4 credits. Prerequisite: background in political or social theory. M. 1:25–3:20. J. Forester. This course explores the critical theory of Jurgen Habermas, particularly its application to problems of planning and public policy analysis. We consider problems of legitimation, power, rationalization, instrumental and communicative action, ideology, and systematically distorted communications as they appear more broadly in the practice of planners, policy analysts, or professionals.

746 Informal Seminar in Planning Theory: Philosophy, Ethics, and Values in Planning Fall or spring. Credit as assigned. Staff. 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 plan be ethical? Must value judgments be arbitrary?
Survey of leading cases and legal concepts in
653 Legal Aspects of Land-Use Planning
Various aspects of planning, historic preservation,
and graphic communication techniques are
explored.

556 Built-Environment Education Workshop
Fieldwork hours to be arranged. Organizational
meeting 10:10 first F of classes. S. Stein.
Interdisciplinary teams of students from planning,
architecture, landscape architecture, historic
preservation, and other environmental design
disciplines work in elementary, middle school, and
high school classrooms with school children and
teachers to deepen their understanding of the impact
of the built environment on their lives and to
encourage their participation in the shaping of their
own environment. Work in local schools is
emphasized.

557 Small-Town Community Design Workshop
An in-depth approach to the problems and
challenges facing the small-town commercial district.
Various aspects of planning, historic preservation,
landscape architecture, and design, including building
and open space rehabilitation, graphics and
signage, construction details, and presentation are
explored in workshop and studio settings.

558 Urban Transportation and Land-Use Planning
4 credits. Open to upper-level undergraduates.
Not offered 1983–84
S. Czarnanski, K. C. Parsons.
Theoretical and analytical aspects of the relationships
between land-use planning and transportation system
planning; land-use transportation models; analysis of
travel-demand generation by land use; forecasting
related to population and urban growth; methods of
transportation-demand analysis, modal split, project
evaluation, national, regional, and local transportation
policy related to regional and urban development,
and a systematic review of American city planning history,
beginning with the earliest colonial settlements and
ending with the era of the New Deal. Students will use
the extensive holdings of the Special Collections
Library, the local press, external reports, and
library resources at Cornell and
other public and university libraries.

561 Urban Land Policy and Programs
Fall or spring. 3 credits.
S. Stein and/or other.
Prerequisite: CRP 511 or permission of instructor.
Major problems of urban land control and
management, and possible solutions are considered.
Subjects for discussion include taxation,
compensation and betterment, large-scale public
land acquisition, subsidies and incentives, and
acquisition of development rights.

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.

653 Legal Aspects of Land-Use Planning
Spring. 3 credits. Prerequisite: CRP 511 or permission of instructor.
R 12:20–1:15, Staff.
Prerequisite: CRP 511 or permission of instructor.
R 12:20–1:15, Staff.
Survey of leading cases and legal concepts in
land-use planning, with particular attention to zoning,
subdivision control, condemnation, and
growth-control issues.

655 Land Resources Protection Law
Fall
3 credits.
M W F 10–12:05, S. Stein.
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 Preservation

461 Methods of Archival Research (also Architecture 542)
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
Fall
4 credits. No prerequisites.
A systematic review of American city planning history,
beginning with the earliest colonial settlements and
ending with the era of the New Deal. Students will use
the extensive holdings of the Special Collections
Library, the local press, external reports, and
library resources at Cornell and
other public and university libraries.

560 Documentation for Preservation (also Architecture 549)
Fall. 3 credits.
M 2:30–3:30, 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 547)
Fall or spring. 4 credits.
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 543)
Fall. 3 credits.
Lectures, guest lecturers, and tours of historic
districts, landmarks, and other sites.

563 Problems in Contemporary Preservation Practice (also Architecture 544)
Spring. Variable credit.
M. A. Tomlan, T. Wierzbicki.
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 645)
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.
Urban and regional plans, planners, 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 papers of twentieth-century
planners in the 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
Spring. 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,
primary sources, and seminar presentations. Each student
will produce a research paper on an aspect of the
subject, using library resources at Cornell and
elsewhere.

569 Seminar in the History of American City Planning
Spring. 3 credits. Prerequisites: CRP 482 or permission of the 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.

661 Historic Preservation Planning Workshop:
Plans and Programs
Fall and spring. Variable credit.
Prerequisite: CRP 561.
M 12:20–1:15, J. W. Reps.
Preparation of historic preservation plans, designs,
legislation, and special studies. Individual or
group projects are selected by students. Fieldwork is
emphasized.

662 Seminar in American Urban History
Spring. 3 credits. Prerequisite: permission of instructor. Not offered 1983–84.
Practical elements of historic preservation plans,
designs, legislation, and special studies. Individual or
group projects are selected by students. Fieldwork is
emphasized.

663 Historic Preservation Law
Spring. 3 credits
Offered alternate years.
M 12:20–1:15, R. W. 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.
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 financial of real estate projects.

R. I. 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. 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 1983–84.
S. Steen and guest lecturers.
Seminars covering the broad urban planning and development problems facing Latin American cities. Historical context 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 1983–84.
S. Steen.
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 workshop-studio setting.]

670 Regional Planning and Development in Developing Nations Fall 4 credits. Prerequisite: second-year graduate standing. Not offered 1983–84.
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 in the concepts of equity and efficiency, external economies, export linkages, and internal self-sufficiency and integration. Resource development, national integration, human development, and migration problems are discussed.]

671 Seminar in International Planning Spring 1 credit. S–U grades only. F 12:00–1:00. Staff.
The international planning lecture series sponsors lectures by visiting scholars or professionals in the field of international development and planning. The only requirement is that the course be a broad evaluation of the series at the end of the semester.

D. Lewis.
An examination of the issues facing developing countries as they endeavor to use technology in pursuit of their national goals. Topics include alternative choices of technology and the associated impacts, the role of multinational corporations, government policy-making institutions, manpower development, and utilization strategies, and policy instruments.]

F 10:00–11:00. D. Lewis.
An exploration of the international transfer of technology to developing nations and the policies used to guide this process. Topics covered included the role of foreign aid and multinational corporations, economic rationale for choice of appropriate technology, and social and benefit-cost analysis. Case studies are emphasized.]

[723 Seminar in Project Planning in Developing Countries Spring 3 credits. Not offered 1983–84.
An examination of the problems and issues involved in the process of planning and implementing development projects in developing countries. The role of the planner is explored from several different disciplinary points of view through a series of case studies selected from agriculture, industry, rural development, and urban planning. Countries typically represented include Egypt, Ethiopia, India, Jordan, Korea, Mexico, Nepal, and the Commonwealth of Puerto Rico.]

774 Science, Technology, and Development Fall 3 credits.
P. Opladwala.
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. Opladwala.
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.

777 Theories of Development and Underdevelopment Spring. 3 credits.
P. Opladwala.
Various theories attempting to analyze and explain the phenomena of underdevelopment are examined. Although a range of thought and approaches are considered, the accent is on aspects of political economy revolving around concepts of class and exploitation. Topics include the transition to capitalism, dependent and uneven development, various issues of growth and fluctuation under contemporary capitalism, including crises; rural and industrial development in less-developed countries; and planning for development.

778 Fieldwork or Workshop in Planning for Developing Regions Fall or spring. 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.

878 Advanced 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, 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 Tutorial in Urban and Regional Studies Fall or spring. Variable credit. S–U grades only. Limited to undergraduate students in the Urban and Regional Studies program.
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 and medical care delivery systems, economic development, and other policy issues.

685 Environmental Epidemiology Spring. 3 credits. Prerequisite: CEP 520.
W 9:00–11: Staff.
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 1983–84.
Examination of selected environmental law topics from a policy management standpoint. Topics include
530 Urban Landscape Planning and Design Spring, 3 credits
Lec, disc, and field trips to be arranged. L. Mirin.
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 strolling ways, 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, 3 credits
A. S. Lieberman.

601–602 Studio: Regional Landscape Planning Fall, LA 601, weeks 1–7, 3 credits; LA 602, weeks 8–14, 3 credits. P. J. Trowbridge.

603–604 Studio: Urban Design Fall, LA 603, weeks 1–7; 3 credits; LA 604, weeks 8–14, 3 credits. R. T. Trancik.

606 Studio: Interdisciplinary Site Planning Spring, 6 credits
T. H. Johnson.

607 Studio: Professional Practice Fall, weeks 1–8, 3 credits. Required 5-day field trip. M. I. Adleman.

609 Studio: Advanced Site Design Fall, weeks 8–14, 3 credits. M. I. Adleman.

621 Summer Internship Seminar Fall, 2 credits.
Hours to be arranged. L. Mirin.
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. Mirin.
Work on applied problems in landscape architecture in a field or studio setting or both.

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.

Faculty Roster
Bertoia, Roberto, M.F.A., Southern Illinois U. Asst. Prof., Art
Blum, Zevi, B. Arch., Cornell U. Assoc. Prof., Prof. Art
Booth, Richard S., J.D., George Washington U. Asst. Prof., Prof. City and Regional Planning
Branderford, Paul, Ph.D., Harvard U. Asst. Prof., City and Regional Planning
Clavell, Pierre, Ph.D., Cornell U. Prof., City and Regional Planning
Cohan, Peter, M. Arch., Harvard U. Adjunct Assoc. Prof., Architecture
Colby, Victor E., M.F.A., Cornell U. Prof. emeritus, Art
Crump, Ralph W., B. Arch., Cornell U. Prof. emeritus, Architecture
Czamanski, Stan, Ph.D., U. of Pennsylvania. Prof., City and Regional Planning

Daly, Norman, M.A., Ohio State U. Prof. emeritus, Art
Dennis, Michael D., B. Arch., U. of Oregon. Prof., Architecture
Evett, Kenneth W. M. A., Colorado Coll. Prof. emeritus, Art
Forester, John, Ph.D., U. of California at Berkeley. Asst. Prof., City and Regional Planning
Goethner, Werner H., M. Arch., Cornell U. Asst. Prof., Architecture
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. Adjunct Assoc. Prof.
Jones, Barclay G., 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
Kira, Alexander, M.R.P., Cornell U. Prof., Architecture
Kubelt, Martin, H.D., Rheinisch-Westfälische Technische Hochschule (Germany). Assoc. Prof., Architecture
Lewis, David B., Ph.D., Cornell U. Assoc. Prof., City and Regional Planning
Lolley, Jean L., M.F.A., Ohio U. Asst. Prof., Art
MacDougal, Bonnie G., Ph.D., Cornell U. Asst. Prof., Architecture
MacDougal, Robert D., Ph.D., Cornell U. Asst. Prof., Architecture
Mikus, Eleanore, M.A., U. of Denver Assoc. Prof., Art
Miller, John C., M. Arch., Cornell U. Assoc. Prof., Architecture
Minn, Leonid J., M. LA, U. of Michigan. Assoc. Prof., Landscape Architecture
Nelson, Dorothy W., B.A., Cornell U. Prof., City and Regional Planning
Pears, Donald, M. R.P., Cornell U. Prof., City and Regional Planning
Pearman, Charles W., B. Arch., U. of Michigan. Prof., Architecture
Pilman, Jon H., M.S., Cornell U. Asst. Prof., Architecture
Poleski, Stephen F., B.S., Wilkes Coll. Prof., Art
Reps, John W., M. R.P., Cornell U. Prof., City and Regional Planning
Richardson, Henry W., M. R.P., Cornell U. Assoc. Prof., Architecture
Romanach, Maria, M. Arch., Princeton U. Assoc. Prof., Architecture
Saltzman, Sid, Ph.D., Cornell U. Prof., City and Regional Planning
Saul, Frank N., M. S., Harvard U. Assoc. Prof., Architecture
Schack, Mario L., M. Arch., Harvard U. Prof., Architecture
Schier, Marc, M. S., Cornell U. Asst. Prof., Architecture
Seyler, Jason B., Cornell U. Prof., Art
Senkevitch, Anatole, Ph.D., Cornell U. Assoc. Prof., Architecture
Singer, Arnold. Prof., Art
Squier, Jack L., M.F.A., Cornell U. Prof., Art
Stein, Stuart W., M.C.P, Massachusetts Inst. of Technology. Prof., City and Regional Planning
Stewart, Ian R., Ph.D., Cornell U. Assoc. Prof., City and Regional Planning
Ungers, O. Mathias, Diploma, Technical U. Karlsruhe (Germany). Prof., Architecture
Warke, Val K., M.Arch., Harvard U. Assoc. Prof., Architecture
Wells, Jerry A., B.Arch., U. of Texas. Nathaniel and Margaret Owings Distinguished Alumni Professor of Architecture, Architecture
College of Arts and Sciences

Administration
Alain Szenez, dean
Lynne S. Abel, associate dean
Geoffrey V. Chester, associate dean
Urban J. DeWinter, associate dean and director of admissions
Jack W. Lowe, director of finance and administration
Lloyd Carter-Leavitt, director of development

College of Arts and Sciences Calendar Supplement

All of the dates in the University calendar at the front of this volume apply to all Cornell students. Listed below are some additional dates that are of importance for students in the College of Arts and Sciences.

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>Deadline for submitting independent major requests (first meeting)</td>
<td>Oct. 14</td>
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<tr>
<td>Last day for adding courses without petition</td>
<td>Oct. 26</td>
</tr>
<tr>
<td>Last day for dropping courses without $10 fee</td>
<td>Oct. 21</td>
</tr>
<tr>
<td>Last day for changing grade option (S-U)</td>
<td>Nov. 2</td>
</tr>
<tr>
<td>Deadline for submitting independent major requests (second meeting)</td>
<td>Nov. 11</td>
</tr>
<tr>
<td>Last day for requesting leave of absence or withdrawal for the current term</td>
<td>Dec. 16</td>
</tr>
<tr>
<td>Deadline for dropping courses without petition</td>
<td>Dec. 16</td>
</tr>
<tr>
<td>Deadline for requesting permission to study in absentia</td>
<td>End of the preceding semester</td>
</tr>
<tr>
<td>Advance course enrollment for the following term (tentative)</td>
<td>Oct. 31</td>
</tr>
<tr>
<td>Deadline for applying to the College Scholar Program</td>
<td>Nov. 11</td>
</tr>
<tr>
<td>Deadline for requesting internal transfer to the College of Arts and Sciences for the following term</td>
<td>Last day of finals, May</td>
</tr>
</tbody>
</table>

Program of Study

The College of Arts and Sciences at Cornell is a traditional liberal arts college. It is composed of those departments that teach and study the humanities, the basic sciences, the social sciences, and the expressive arts. It is also a college within a university, and this wider community provides strength and diversity not available in an isolated undergraduate institution. Students may draw upon the knowledge and facilities of the professional colleges to supplement their studies. Finally, the college is a graduate school and research center attracting faculty whose active involvement in writing and research requires first-rate academic facilities and whose energetic participation in undergraduate teaching brings to their students the most current ideas in modern scholarship. It is this combination of functions that gives the college its distinctive character.

The variety and richness of the curriculum is extraordinary; there is no course that all students must take and there are several hundred from which they may choose. Yet the faculty believe that there should be a recognizable pattern to each student's education.

That pattern includes familiarity with the several different modes of thought that are reflected in the natural sciences, the social sciences, and in the achievements of intellect and imagination that are the focus of the humanities and the expressive arts.

In addition to these general areas of knowledge, students study foreign languages, acquire effective writing skills, and concentrate on one particular field to develop, as fully as possible, the powers of imaginative and critical thinking. To accomplish these objectives, the college has certain requirements for graduation.

Summary of Basic College Requirements for Graduation

1) Minimum number of courses: 34 courses
2) Foreign Seminar: Two courses.
3) Foreign language: Qualification in two languages or proficiency in one (zero to four courses for proficiency in one language, zero to six courses for qualification in two, depending on placement).
4) Distribution: An approved sequence of 2 full courses (6-8 credits) in each of the four groups listed below:
   - Group 1: Biological sciences
   - Group 2: Social sciences
   - Group 3: Humanities
   - Group 4: Mathematics and computer science
4a) A minimum of 120 credits, of which 100 must be taken in the College of Arts and Sciences.
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 terms, unless a student can successfully complete the other requirements in fewer than eight terms and is allowed to accelerate graduation. See p. 95.
9) Physical education: Completion of the University requirement. See p. 23.

Ordinarily a student may not use the same course to fulfill more than one college requirement. See page 96.

Minimum Number of Courses and Credits

Students who are first admitted to the College of Arts and Sciences in the fall of 1980 or thereafter must complete at least thirty-four courses to graduate, that is, four to 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. When single-credit courses form a part of a series (certain offerings in mathematics, biology, and music, for instance) they 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 Colleges and Sciences, to earn the Bachelor of Arts degree. Credits earned from advanced placement examinations, courses approved for study in absentia, 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 seventy courses offered by over twenty different departments in the humanities, social sciences, and expressive arts. These courses all share one major purpose: to offer the student practice in writing English prose. They also ensure that all beginning students may have the benefit 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.

There are two ways of satisfying the language requirement:
1) by attaining proficiency in one language or
2) by attaining qualification in two languages.

Proficiency

Proficiency is attained by passing a 200-level course (or Chinese or Japanese 161) or by equivalent achievement, to be determined by examination; see below under Advanced Standing Credit.

Qualification

Qualification may be attained in any of the following four ways:
1) Three years of high school study in any one language gives qualification in that language. Note: However, that this route to qualification does not guarantee entrance into a 200-level course. The student who wants to continue in this language must be placed by examination.
2) Pass 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 112 in Arabic; Classics 103 or 104 in Greek; Classics 106, 107 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 get 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.

Language Course Placement and Credit

Students who have had two or more years of high school study in a language may register in any course in that language without being placed by examination. Nor may 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 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>French</th>
<th>CPT</th>
<th>Reading Score</th>
<th>Language</th>
<th>Literature Courses</th>
<th>Courses</th>
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<tbody>
<tr>
<td>Below 450</td>
<td>121</td>
<td>450 – 559</td>
<td>123</td>
<td>203</td>
<td>200</td>
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<tr>
<td>560 – 649</td>
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<tr>
<td>650 and above</td>
<td>650 and above</td>
<td>Apply for the Cornell Advanced Standing Examination (CASE)</td>
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<tr>
<th>German</th>
<th>CPT</th>
<th>Reading Score</th>
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<th>Literature Courses</th>
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<tr>
<td>Below 450</td>
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<th>Italian</th>
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<th>Reading Score</th>
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<th>Literature Courses</th>
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<tr>
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<th>Russian</th>
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<th>Language</th>
<th>Literature Courses</th>
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<tbody>
<tr>
<td>Below 450</td>
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<td>450 – 559</td>
<td>102</td>
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<tr>
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<tr>
<th>Spanish</th>
<th>CPT</th>
<th>Reading Score</th>
<th>Language</th>
<th>Literature Courses</th>
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For example, a student who fulfills group 1 with biology, group 2 with psychology, and group 3 with theater 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 141 – 142, History of Architecture I and II, in the Department of Architecture of the College of Architecture, Art, and Planning to fulfill 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 such as 101 – 102 or 207 – 208; or any two general-education courses from the group 200 – 206, 209.

**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 on the AP, 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 listed under archaeology. Courses cross-referenced but not taught by members of the department do not satisfy the distribution requirement.

Archaeology: Archaeology 100 and any one of the following: Archaeology 203, 281, 309, 317, 401, or Anthropology 116, 250, 352, 354, 355, 356, 358, 435, 456, 493, 494, 663, 664, 667.

Economics: 101 – 102 or a combination of one of these courses and any course for which it is a prerequisite, if the course is taught by a member of the Department of Economics.

Government: Any two of 111, 131, 161, or 181, or any one of these courses followed by a 300-level course in the same area.

Linguistics: 101 or 111 and (1) any other course in linguistics or (2) any other course offered by the Department of Modern Languages and Linguistics for which one of these introductory linguistics courses is a prerequisite.

Near Eastern Studies: Any two NES archaeology courses at the 200 or 300 level that form a reasonable sequence or combination.

Psychology: Any two courses in psychology with the exception of Psychology 123, 322, 324, 326, 350, 361, 396, 422, 425, 471, 472, 473, 476, and 493.

Sociology: 101 – 201 or one of these courses followed by any 200-level course in sociology.

Women’s Studies: Any two of 236, 244, 277, 321, 353, 422, 685, plus courses that have been taken previously, with the department’s approval.

**b. History**


History: Any two courses in the Department of History.
Group 3: Humanities or Expressive Arts

a. Humanities


Asian Studies: Any two courses given by the department numbered 200 or above that form a reasonable sequence, but not including related courses in other departments unless the Department of Asian Studies grants permission. 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, 112, 118, 120, 121, 150, 200, 206, 211, 212, 220, 221, 222, 224, 225, 232, 233, 236, 237, 238, 245, 300, 309, 319, 320, 321, 322, 323, 326, 327, 329, 330, 331, 333, 336, 337, 339, 340, 350, 363, 366, 462, 610, 629, 630.

Comparative Literature: Any two of the 200- or 300-level courses in comparative literature. 400-level literature 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 language requirement, they should not take courses numbered in the 80s (e.g., 281, 382) to satisfy the humanities requirement.

French Literature: Any two courses from 200, 201, 202, 222, or 300-level literature courses.

German Literature: Any two courses at the 200 level or above.

Italian Literature: Any two of 201–202 or any 300-level literature courses.

Near Eastern Studies: Any two NES civilization or literature courses at 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, 431, 432, and 436.

Russian Literature: Any two courses at the 200 level or above.

Spanish Literature: Two of 201, 315, 316, 317, or any other 300-level literature courses.

Women’s Studies: Any two of 248, 249, 251, 348, 399, 451, 453, 456, 467, 478, 479, 483, 493, plus courses that have been taken previously, with the department’s approval.

b. Expressive Arts


Archaeology: Archaeology 100 and any one of the following: Archaeology 220, 320, 321, 322, 323, 325, 329, or 330.

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. Either a maximum of 4 credits in Music 321–322 and a maximum of 4 credits in Music 331 through 339 and 441 through 450 may be used to satisfy this requirement.

Theatre Arts: Any two of the 3- or 4-credit courses at the 200 level or above.

Women’s Studies: Any two of 248, 249, 348, 399, 451, 453, 478, 479, 483, 493, plus past courses, with the department’s approval.

Group 4: Mathematics or an Unused Subdivision

a. Mathematics and Computer Science

Any 6 credits in Mathematics, but not including more than one course in 107, 403. Computer Science 100 or 211 may be used for three of these 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 unused subdivision

A sequence of courses, but not one of the subdivisions in groups 1–3 that has not been used to fill that group’s requirement.

The Major

In their last two years, students devote roughly one-half their time acquiring depth and competence in a major subject. The choice of major is not intended to lead to a lifetime’s occupation, although it may do so. By selecting one field of interest, students can do advanced work and focus the full extent of their imaginative and intellectual capacities on something they care about.

Students must be accepted by departments as majors before registering for courses for the junior year. Most departments and programs specify certain prerequisites for admission to the major; students should consult the departmental listings on the following pages. A department may refuse to accept as a major any student whose performance does not meet departmental standards. Some majors require courses in related subjects as well as at least some years of college work outside the college. Required courses taken outside the college are considered to be part of the 100 credits required in the College of Arts and Sciences for graduation. Majors are offered by each of the departments except the Department of Astronomy. There are also majors in Africana Studies, American studies, archaeology, biology and society, dance, German area studies, Russian and Soviet studies, and social relations.

Some students wish to pursue an interest that cannot be met within an established major. They may plan, with the help of their faculty adviser, an independent major that includes courses from several departments.

Electives

Any of the thirty-four courses, or 120 credits, required for graduation, above 209 are free electives. Students must complete four or five courses or 15 credits in courses that are offered outside the major and are not used to fill the distribution requirement. Electives taken in other divisions of the University may be used to gain practical training or specialized knowledge.

Courses and College Requirements

A course may not be used to fulfill more than one college requirement, with the following exceptions:

1) A course may be used to fulfill a distribution requirement and also a major requirement, provided that the major department agrees.

2) A one-semester course in foreign language that is acceptable for achieving proficiency in that language may also be used as a partial fulfillment of the distribution requirement in the humanities.

3) Students whose native language is not English who take English 211–212 may fulfill both the Freshman Seminar requirement and the humanities or expressive arts distribution requirement, provided that two Freshman Seminars offered in English, history, history of art, Classics, philology, romance studies, Russian literature, German literature, or comparative literature. Courses used to fulfill college requirements may be taken for S-U grades.

Residence

The college expects its students to earn credits toward the degree during full-time study at Cornell, normally for eight semesters. Participation in approved programs such as in absentia study, fieldwork programs, or Cornell-in-Washington, which the college encourages, is considered study at Cornell. Students occasionally enter with advanced placement credit from other institutions (this does not include advanced placement credit from the CPT program, for which regular Cornell credit is granted), take leaves and complete courses at other institutions, or take summer courses at other institutions. The college will accept up to 20 credits from other institutions as part of the out-of-college electives if the appropriate departments at Cornell approve. If the courses are accepted as part of the major, the credits will count as part of the 100 needed in the college and thus leave more flexibility for taking courses in other colleges at Cornell, but still no more than 20 credits will be accepted from other institutions (excepting approved in absentia study, for which up to 30 credits will be accepted).

Credits earned at other institutions may not normally be substituted for the final two semesters. Nor may students leave the college after three or three and a half years and complete their degrees with credits accumulated at other institutions 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 on page 99 or present convincing academic reasons for part-time study.

This policy will take effect immediately for students about to go to summer school or on leave or who are requesting now to complete their degrees elsewhere. The new requirements governing acceleration take effect with the class of 1985.

Ninth term. Students may spend a ninth term in residence by notifying the Records and Scheduling Office, 142 Goldwin Smith Hall. Students receiving financial aid should discuss funding with an adviser in the Office of Financial Aid.

Physical Education

See University Requirements for Graduation, p. 23. The college does not count physical education credit toward the 120 credits required for graduation.

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 advisor and are approved by a board of faculty members. Board members consider whether the plan is equivalent in coherence, breadth, and depth to a departmental major, whether it is well-suited to the student’s academic preparation, and whether it provides a liberal education. Independent majors substitute for established majors, but students must still satisfy all the other usual requirements for the baccalaureate degree. Students should contact the director of the Independent Major Program, Academic Advising Center, Goldwin Smith Hall, for further information. Deadlines for submission of independent major proposals are listed on the calendar supplement for the College of Arts and Sciences.
Honors. Candidates for honors must have a cumulative average of 3.0, no grade below B in courses for the major, and a cumulative average of 3.5 for courses in the major. During their senior year candidates for honors complete a thesis or honors project. Interested students should confer with the director of the student Major Program before the start of the senior year.

College Scholar Program

The College Scholar Program frees no more than forty students in each freshman class from the usual college requirements for a degree and allows them to design their own academic programs. It is meant to serve students whose interests and talents do not easily fit into the usual departmental majors, who demonstrate exceptional promise, and who show the maturity to plan and carry out, with the help of their adviser, a well-designed program of studies. College Scholars do not all design the same kind of program: some, for instance, pursue diverse interests while others integrate a variety of courses with a common theme.

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 in the College of Arts and Sciences. They must complete the physical education requirement. All College Scholars must complete a senior project. They are not required to complete a thesis or fulfill the distribution requirement, but members of the College Scholar Advisory Board 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.

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 any 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.

Dual Degree Program

Especially able students may earn both a Bachelor of Arts degree from the College of Arts and Sciences and either (1) a Bachelor of Science degree from the College of Engineering or (2) a Bachelor of Fine Arts 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. The dual degree program ordinarily takes five years to complete. Students enter one of these colleges or the College of Arts and Sciences as freshmen and begin the dual degree program in the second or, in some cases, the third year. For further information students should contact Assistant Dean Rosenberg, 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 semester may have plans 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.

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 more than one instructor.

Undergraduate Research Program

Students interested in participating in a faculty member's research and earning credit for the work should consult Marilyn Williams, Academic Advising Center, 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 number of residential programs allow students to concentrate on one subject, under the instruction of the faculty adviser, and courses must be approved by the directors of undergraduate studies in the departments teaching those subjects. Credits earned in absentia may count as part of the 100 credits required within the College of Arts and Sciences.

Law schools neither require not prefer any particular language. 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.

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, gaining proficiency in the language and familiarity with the culture. Cornell is the first university in the United States to set up a regular student exchange program with the People's Republic of China. 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 rarely require not prefer any particular program of study; they do seek students with a broad 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 if it interests them, not because it helps them get into law school.

Students who are interested in law should consult Assistant Dean Watson, Academic Advising Center, Goldwin Smith Hall.

Preliminary 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 college's Academic Advising Center and the Health Careers Office in Barnes Hall for help in planning their undergraduate program.

Off-Campus Programs

Study in Absentia

Many students find it appropriate 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 an academic sense, the college encourages its students to study in absentia and grants credit toward the degree for work satisfactorily completed. Approximately seventy students study in absentia every year. The college sponsors very few programs abroad, but the Career Center maintains up-to-date information on hundreds of programs all over the world. Before planning a program in absentia, students should consult Assistant Dean Beatrice Rosenberg, in the Academic Advising Center, Goldwin Smith Hall. Advisers in the college will help students find the program most appropriate to their academic goals.

A request to study in absentia must have the support of the faculty adviser, and courses must be approved by the directors of undergraduate studies in the departments teaching those subjects. Credits earned in absentia may count as part of the 100 credits required within the College of Arts and Sciences. Normally, transfer students will not be allowed to study in absentia.

When plans are final, the student should submit the fully approved petition, together with a personal statement explaining the academic justification for the plan, to Assistant Dean Rosenberg, Academic Advising Center, Goldwin Smith Hall. When these conditions are met, in absentia status will be approved on condition that the student is in good academic standing the semester prior to in absentia study. The University charges $15 for each semester of study in absentia, and no more than two such semesters 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 extended 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...
continues the early Bronze Age through the Roman period. The interdisciplinary internship project will further ground 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 Departments of Classics and Near EasternStudies 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 an internship program. Students who wish to serve an internship in a federal agency or congressional office take part in a public-policy seminar. They define and carry out individual research projects that explore the connections between abstract policy issues and the day-to-day activities of the office. Potential internships are arranged through, and approved by, the Cornell-in-Washington program. Students are admitted to the Cornell-in-Washington program by the Department of Government. For further information, see p. 10 or inquire at 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, arrange 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 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 who fail to sign into courses during the designated period must wait until the beginning of the semester and may have difficulty securing places in the courses they desire. Students may schedule up to 18 credits during the advance scheduling period. Information and materials will be available in the Records and Scheduling Office, Goldwin Smith Hall. Before signing into courses students should make appointments with their faculty advisers to plan their programs. Student advisers will also assist students. Any student is welcome to discuss programs and plans with an assistant dean in the Academic Advising Center. The Records and Scheduling Office issues a supplement showing 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 receive their course schedules at University registration in the fall. They also receive a copy of their Permanent Record Card, which shows the course and graduation requirements fulfilled, and academic actions. Copies of Permanent Record Cards are not official transcripts.

Limits on Course Enrollment
Students must take an average of four or five courses (15 credits) each semester in order to graduate in eight terms. At a minimum, students must carry three or four courses (12 credits). If for compelling personal or academic reasons students must carry fewer than 12 credits, they should consult the faculty adviser and file a petition with the Committee on Academic Records. Completion of fewer than 12 credits without permission results in unsatisfactory academic standing. First-term freshmen may not register for more than 18 credits; other students may register for more than 18 credits a term only if their previous term average was A or higher and if their faculty advisers approve. No more than 22 credits may be taken in a regular semester.

Any student who is not officially enrolled in a schedule of courses in the third week of classes will be withdrawn from the college.

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 facilities offered. 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 fourth week of the term. 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. Students may not accelerate courses without the approval of the faculty adviser. They must petition to accelerate in their junior year. Students who decide to accelerate during their last two semesters will need to present their petitions to the Committee on Academic Records. Accelerants must, of course, satisfy all the academic requirements for graduation and complete at least 100 of the 120 credits with grades of C (not C–) or better.

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 designated officer of the appropriate department) and by the faculty adviser. During the first three weeks of the semester, course changes may be made without fees. In order to make changes, the student must first add/drop petitions in the Records and Scheduling Office. After the third week, classes courses may be added only under unusual circumstances. After the eighth week, courses may be dropped only if there are extraordinary and unforeseen circumstances. For each course change a fee of $10 per course will be charged after the third week. A notation of "W" will appear on the transcript for any course dropped after the eighth week.

Leaves of Absence
Many students have found it useful to take time off from college to think about their goals and progress, to gain additional experiences or funds, or just to take a break from studying. Students in good standing who take a leave by the end of the seventh week of the semester are welcomed by the college to return 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 student's return to the college. They are granted 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 the Gannett Health Center. Such leaves are granted for an unspecified length of time (up to five years) with the understanding that the student may return at the beginning of any term after the medical condition in question has been corrected. In some cases students must satisfy the Gannett Health Center that the condition has been corrected before they may return.

3) Conditional leaves may be granted if the student is not in good standing or, in unusual circumstances, after the eighth week of the term. Normally students may return from conditional leaves for at least two terms or until specific and individual conditions, such as completing outstanding work, have been met.

4) Required leaves: The Academic Records Committee may require a leave of absence if a student is in academic difficulty. See Academic Actions, p. 100.

Any student who wishes to take a leave of absence should consult a member of the Academic Advising Center staff. If a student takes a leave before the end of the term, no courses taken that term will be shown on the student's record. 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 the earned credits may be accepted as part of the 120 out-of-college credits of the 120 credits needed for graduation.

Withdrawals
A withdrawal is a voluntary severance of connection with the University. If a student is to withdraw after registering for the term, the withdrawal must be requested before the beginning of the eighth week of classes. A notation of "W" will appear on the transcript for any course dropped after the third week. Upon withdrawal it is assumed that the student will not wish to reregister in the college. Students who seek readmission after withdrawing from the college according to the Academic Records Committee, 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 is attractive for many students whose intellectual interests change. Students who wish to transfer from one college or school at Cornell to another 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 may transfer directly. In other cases the student may be referred to the Division of Unclassified Students. During the term immediately preceding 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 earned for that particular course), or any grades below C. Satisfying this minimum 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 of one term. Interested students 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. Except in 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 any term and is in good standing in a department that requires candidates for honors 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 is forced to drop a course (for reasons beyond his or her control) and has not been able to complete the course work on schedule, may be able to complete the requirements in subsequent terms.
4) A student who is pursuing honors work and must complete extensive research away from the campus, which precludes registering for additional courses, may be allowed to register for fewer than 12 credits.

Students who are allowed to register for part-time study in 1983–84 pay $291.67 per credit plus the full administrative and student service fees of $950. Students who fail to meet graduation requirements in eight semesters may petition the college to enroll in the Division of Extramural Courses.

Forgery on Forms

Students must have course registration forms and all petitions signed by their faculty advisers. The purpose of the signature is to attest that advising has taken place. Forged signatures or credentials on college forms are an academic offense in that it interferes with advising; sometimes it constitutes academic fraud. If advising is forged on academic forms, the effect of the forged document shall be negated. The student may then petition properly to do whatever he or she attempted to do improperly.

The incident shall be made a matter of record in the Academic Integrity Hearing Board confidential file for forgeries. If a student forges more than once or if the forgery would advance the student's academic standing unfairly or 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 or suspension.

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 assignments 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 course placement and credit see pp. 94–95). No more than 30 transfer credits or sixteen courses, including no more than 20 credits in courses not commonly given by the College of Arts and Sciences, may be applied toward the degree. Transfer students must successfully complete at least twelve courses or 60 credits at Cornell; they must be in residence for four terms, not counting Summer Session.

Advanced placement credit. See pp. 11–14.

Summer session credit. A student may earn credit toward the degree by completing courses in Cornell's summer session or by petitioning to take courses at other colleges. Students should consult their advisers regarding summer study plans.

Credit for summer courses not taken at Cornell must be approved in advance by the chairperson of the appropriate Cornell department. The college Records and Scheduling Office, Goldwin Smith Hall, can supply forms and information. Credit earned in summer courses other than those at Cornell will not count toward the 100 credits required in the college. Transcripts should be sent to the Records and Scheduling Office, Goldwin Smith Hall.

Entering students who wish to receive credit toward the degree for courses completed in a summer session at Cornell or elsewhere should have transcripts sent to the Office of Records and Scheduling, Goldwin Smith Hall, during the summer before matriculation.

Student-initiated courses. The college allows students to initiate proposals for new courses or modes of instruction that are not currently offered in the college or elsewhere in the University. If the proposed course falls within the jurisdiction of a particular department, students should seek the advice of a faculty member in the department or the department chairperson. For further information students should consult the Academic Advising Center, Goldwin Smith Hall.

Noncredit courses. The college does not grant credit toward the degree for all courses offered by the University. Courses in remedial or developmental reading (from the Education 100) and mathematics, and supplemental science courses offered by the Learning Skills Center, carry credits that are counted toward good standing in a given semester but not toward graduation. Physical education, typing, shorthand, and most military training courses are among those for which credit is not given.

Auditing. There is no formal arrangement for auditing courses by undergraduates. Those who wish to sit in on a class ask permission of the course instructor.

Repeating courses. Students may repeat courses. If the instructor certifies that the course content has been changed, credit may be granted a second time. If the content has not been changed the course may be repeated to obtain a better grade, but the original grade remains on the transcript and credits for the repeated course are not counted toward graduation.

Students who plan to repeat a course should notify the Records and Scheduling Office, 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.

Honors

Dean's List

Students must earn letter grades for at least 12 credits to qualify for Dean's List. The requirements vary according to the number of credits a student has taken during the term. Students who take only 12 credits must earn all As. Students who take 13 or 14 credits must earn As in at least 10 credits and Bs in the rest. Students who take 15 or more credits in the term must earn As in at least 6 credits and usually As or Bs in the rest. Students who have grades of C or C+ must have an equal number of As beyond the minimum of 8 to balance the Cs.

Students who have received a grade of U (not including a U in physical education), or a grade of C− or lower, are not qualified for the Dean's List.

Incomplete grades. Qualification for the Dean's List is on the basis of credits completed by the end of the term. If there is an incomplete grade, the student's name will be added to the Dean's List retroactively when the Incomplete is made up, provided that he or she is not disqualified by the grade for the completed course.

Two-term honors programs. When students are in honors programs that require S or R grades at the end of the first semester, their final grades will be considered the appropriate grade for the first semester as well as the second semester. If they then qualify for the Dean's List they will be added retroactively.

Grades that do not enter Into computation. A grade of S does not enter into the calculation, nor does the W that is awarded when a student withdraws from a course. A course graded S may not count as part of the credits for which letter grades are required. Courses for which students of the College of Arts and Sciences may not earn credit are disregarded in the calculation of the Dean's List. See the section on Noncredit Courses, above.

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 investigation. 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 obtaining 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.
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 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 may be considered for academic action by the Committee on Academic Records, the Committee of Deans, or one of the deans of the college.

Academic Actions

Warning. Any student who fails to maintain good standing may be warned. The warning may be given 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.

Final warning. Students whose work is seriously deficient that they risk being required to leave may be placed on Final Warning by the Committee on Academic Records. 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. 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 does not appear on official transcripts.

May not reregister. The Committee on Academic Records may stipulate that a student may not reregister in the college, on the basis of a highly unsatisfactory term or for failure to make satisfactory overall progress in grades, credits, or the requirements of the major. This action expels the student permanently from the college. "May not Reregister" is posted on the student's Permanent Record Card; the University registrar is notified, and "May not Reregister in the College of Arts and Sciences" and the date will appear on the official transcript.

Students being reviewed for academic action are urged to present evidence that will help explain their poor academic performance. Students may appeal a decision or action of the committee if they have new evidence to present.

Grades

Letter Grades

See Grading Guidelines, p. 22.

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-. If the student's Permanent Record Card at the end of the first term shows the student's "May not Reregister in the College of Arts and Sciences" and the date will appear on the official transcript.

The Committee on Academic Records to take a leave of absence, normally for a full year. 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 does not appear on official transcripts.

Academic Advising Center

Glenn Alltschuler, assistant dean, freshmen Beatrice G. Rosenberg, assistant dean, sophomores Margaret C. Unsworth, assistant dean, juniors Lawrence Watson, assistant dean, seniors Janice P. Turner, assistant dean for minority affairs

The Academic Advising Center, Goldwin Smith Hall, serves as a resource for faculty and student advisors 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., and they welcome all questions relating to the college.
Courses and Departments

Special Programs and Areas of Concentration

The college offers a number of special and interdisciplinary programs that are described following the departmental program descriptions. Students may devise an independent major with the aid of any of these programs or develop an informal major field. Informal minors are not listed on the student's official record.

Akkadian

See Department of Near Eastern Studies, p. 174.

American Studies

S. C. Strout, chairman and director of undergraduate studies, 10 Rockefeller Hall, 256-4611; M. J. Colacurcio, R. L. Moore, R. Polenberg, F. Somkin

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 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 advisor.

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 improved many strategies to approach these differences and uniformities. Some are archaeological, concerned with cultures long gone or destroyed by the spread of empires. Others are sociocultural, concerned 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 analyses, the interpretation of symbol systems, and varieties of comparative methodologies are all part of anthropology.

Five introductory courses offer choices among the different strategies for doing anthropology. Four (112, 113, 114, and 116) explore major strategies for doing anthropology, lessons learned so far, and questions yet to be addressed. Anthropology 111 focuses on the fundamental questions raised by all these approaches to anthropology—the issues that form the core of our concerns as anthropologists. The other departmental offerings deepen and broaden this basic knowledge. All anthropology courses with numbers below 200 are open to all students unless otherwise stated in the course description.

The Major

The student who majors in anthropology must:

1) Take two courses at the 100 level: one in sociocultural anthropology (either 111, 112, or 113) and one in biological anthropology or anthropological archaeology (either 114 or 116), preferably during the freshman or sophomore years. (Freshman Seminars in anthropology do not fulfill this requirement.)

2) Take anthropology 300, The Discipline of Anthropology, no later than the fall term of the junior year.

3) Take at least one course in each of four of the following five categories: Category III, Archaeological Courses; Category IV, Biological and Ecological Anthropology; Category V, Sociocultural Anthropology; Category VI, Theory and History of Anthropology; Category VII, a course that focuses on some world area.

4) Develop one or more areas of specialization within the discipline in consultation with his or her faculty adviser. Examples of such specializations include sociocultural anthropology, anthropological archaeology, theory and history, area studies, and biological and ecological anthropology. Students interested in any of these specializations must consult with the director of undergraduate studies, who will refer them to an appropriate academic advisor. When appropriate, special provisions for meeting major requirements may be arranged with the advisor's approval.

5) Take a total of 32 credits of course work, in addition to Anthropology 300, beyond the introductory level. Up to 12 credits of course work in cognate disciplines (see Category VIII) related to the student's specialization may be accepted for the major with the permission of the faculty adviser.

Honors. Anthropology majors interested in the honors program should consult the director of undergraduate studies before the beginning of their senior year and apply for admission to the program. Candidates for the degree of Bachelor of Arts with honors in anthropology must complete a thesis in the final term of the senior year. Students may enroll in Anthropology 491 or 492, Honors Thesis, after obtaining the consent of the Honors Committee. The decision to award honors and in what degree is based on the quality of the thesis and the student's overall record.

Facilities

The anthropology laboratory contains a small statistical and reference library as well as basic drafting and photographic equipment.

Special Programs

Specialized individual study programs are offered in Anthropology 497–498. Topics in Anthropology, open to a limited number of juniors and seniors who have obtained consent of the instructor. Undergraduates should also note that most 600-level courses are open to them if consent of the instructor is obtained.

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.

I. Introductory Courses (Including Freshman Seminars)

111 Nature and Culture

Spring. 3 credits (4 by arrangement with instructor).

M. W. F. J. Wylie.

Anthropology arose as a novel attempt to address fundamental questions about humanity. Who are we? Where do we come from? Where are we going? Though it does not provide privileged answers to these questions, it approaches them through a unique combination of methods and a spirit of comparative inquiry. Inspired by the long view from the study of human evolution and culture history, and the comparative view arising from the study of contemporary human biological and cultural diversity and uniformity, anthropology aspires to examine the relationships between the physical/biological and symbolic/moral worlds in which we live. This course examines a variety of past and current attempts to explain the relationships between nature and culture in human life.

112 Social Anthropology

Fall. 3 credits (4 by arrangement with instructor).


Among the ways they study human life, anthropologists examine 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. We explore the world's cultural diversity as well as the question of what cultural differences mean. Most of the readings are firsthand accounts by ethnographers; films and discussions supplement the lectures.
113 The Comparison of Cultures Spring 3 credits (by arrangement with instructor) T R 10:10-11:25 D. H. Holmberg. An introduction to cultural anthropology through ethnographies and the first-hand accounts of anthropologists. Through readings and lectures students acquaint themselves with a number of cultures from several parts of the world. The cultures are drawn 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 forms as they are expressed in social, economic, and political 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 even excerpts supplement the formal anthropological materials.

114 Humankind: The Biological Background Fall 3 credits (by arrangement with instructor) M W F 11:15 R. Dyson-Hudson. Anthropological inquiries about human origins, biocultural diversity, and behavior require an understanding of the causes and effects of evolution. This survey of biological anthropology examines controversies about human origins and antiquity, human adaptations to past environments, socioculture, biological variability in ancient and modern populations, and the basis for the evolution of diversity of cultural behaviors. Lectures are supplemented with films, laboratory and discussion sections, and guest lecturers.

116 Ancient Societies Fall 3 credits (by arrangement with instructor) M W F 10:10 J. S. Henderson. An introduction to anthropological archaeology using case studies to illustrate the reconstruction of ancient societies. Cases represent a variety of geographic areas and levels of cultural complexity, including hunting bands, farming villages, kingdoms without cities, and urban empires. The course illustrates processes of archaeological reasoning and provides a perspective for evaluating popular ideas about cultural evolution.

130 Apes and Languages Fall and spring 3 credits. Freshman Seminar M W F B. J. Isbell. Extraordinary claims have been made about the language capacities of chimpanzees and gorillas. Are the apes talking? How does the sign language that has been taught to apes compare with natural spoken languages? A selection of popular and scholarly books and articles are examined in order to better understand the key issues in the debate over the language capacities of apes. This Freshman Seminar is designed to teach students the skills of critical writing. There are no "correct" answers to most of the issues raised in this course. Students will read and discuss both sides of issues and develop arguments. Weekly writing assignments will range from one paragraph to two or three pages.

[150 The Discovery of America Spring 3 credits. Freshman Seminar] Not offered 1983-84.

205 Ethnographic Films Fall and spring 2 credits W 7:30-9 p.m. B. J. Isbell. Human cultural and social variability is explored through a series of ethnographic films, and readings and lectures relating to these films. The films are chosen to show peoples living in a variety of ecological situations and at different levels of social complexity in various parts of the world (i.e., Africa, Asia, Australia, the Americas). Readings and lectures will use the concepts and theories of cultural anthropology to interpret the significance of the different modes of life shown in the films.

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. M W F 3:35 A. T. Kirsch, with the anthropology faculty. The course is an overview of the field of anthropology, it provides a systematic treatment of the discipline, the concepts that are used, the persistent questions that are asked, the specializations within the field, and the shared goals and differing viewpoints. The course is intended to help majors plan their course work.

491 Honors Thesis Fall 4 credits. Prerequisite: consent of the Honors Committee. Intended for majors graduating in midyear. Hours to be arranged. Staff. Independent work under the close guidance of a faculty member selected by the student. (4 by arrangement with instructor.)

492 Honors Thesis Spring 4 credits. Prerequisite: consent of the Honors Committee. Hours to be arranged. Staff. Independent work under the close guidance of a faculty member selected by the student.

495 Social Relations Seminar (also Sociology 497) Spring. 4 credits. Limited to seniors majoring in social relations. Hours to be arranged. Staff.

497-498 Topics in Anthropology 497, fall. 498, spring. Credit to be arranged. Hours to be arranged. Staff. Independent reading course in topics not covered in regularly scheduled courses. Students select a topic in consultation with a faculty member who has agreed to supervise the course work.

III. Archaeological Courses

See also courses listed under Archaeology.

203 Early People: Human Cultural and Biological Evolution (also Archaeology 203) Fall. 3 credits. T R 1-2:15. T. P. Volman. This course surveys the archaeological and fossil record of human evolution. Contributions by researchers from a variety of scientific disciplines are highlighted, as well as 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.

250 The Earliest Civilizations Fall. 4 credits. Not offered 1983-84.

352 Interpretation of the Archaeological Record Fall. 4 credits. T R 2:30-3:45 C. Morris. Basic principles and procedures of archaeological data collection and analysis considered in the context of modern archaeological theory. Problems of sampling the statistical treatment of artifacts, and the development of practical archaeological research designs are among the topics covered.

354 The Peopling of America Fall. 4 credits. M W F 9:05 T. F. Lynch. This course examines the peopling of the New World, beginning with American Indian origins in Asia and ending with the largely unrecorded European medieval contact with North America. Major topics include crossing the Bering land bridge, big game hunting and extinction, postglacial adaptations to changing environments, diversified subsistence in the eastern woodlands, agricultural civilizations of the Midwest and Southwest, and Eskimo and Norse exploration and settlement across the Arctic and North Atlantic.

355 Archaeology of Mexico and Central America Spring. 4 credits. M W F 9:05 J. S. Henderson. A consideration of the origins, development, and spread of the Olmec, Maya, Aztec, and other native civilizations of Mexico and Central America. Prehistoric cultural developments from the emergence of settled farming life, through the rise of states, to the European conquest of the Aztecs will be emphasized.

356 The Archaeology of South America Spring. 4 credits. T R 8:40-9:55 T. F. Lynch. Origins and development of South American agriculture and civilization, with special attention to Peru, the Andean heartland, and diffusion into the lowland Amazon and Caribbean. Major topics include the domestication of plants and animals, the rise of temple-based cults and great art styles, the formation of militaristic states, regional interaction and the Inca empire, and the possibility of transoceanic influences.

[V. Sociocultural Anthropology

242 American Indian Philosophies: Power and World Views (also Rural Sociology 242) Fall. 3 credits. Prerequisites: Anthropology 242 and permission of instructor. T R 2:30-3:45 S. C. Saraydar. A survey of the philosophical thought and world views of American Indians of the past and present. These philosophies of contemporary figures such as Lame Deer, Deloria, Momaday, and the enigmatic Don Juan are evaluated along with those of Black Elk, Handsome Lake, and other Indians of earlier times. 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.

[358 Archaeological Research Methods (also Archaeology 356) Spring. 4 credits. Not offered 1983-84.]

[361 Field Archaeology in South America (also Archaeology 361) Spring. 10 credits. Not offered 1983-84.]


[493 Seminar in Archaeology: The Maya Fall. 4 credits. Not offered 1983-84.]

[494 Seminar in Archaeology: Settlement Archaeology Spring. 4 credits. T 2:30-4:25 J. S. Henderson. Archaeological approaches to ancient settlement Analysis of households, neighborhoods, communities, and regions. Emphasis is on strategies of field investigation and analytical methods.

476 Human Behavior: An Evolutionary Perspective Spring. 4 credits. Not offered 1983-84.]

V. Sociocultural Anthropology

242 American Indian Philosophies: Power and World Views (also Rural Sociology 242) Fall. 3 credits. Prerequisites: Anthropology 242 and permission of instructor. T R 2:30-3:45 S. C. Saraydar. This course is designed to facilitate an understanding of the world views of American Indians of the past and present. The philosophies of contemporary figures such as Lame Deer, Deloria, Momaday, and the enigmatic Don Juan are evaluated along with those of Black Elk, Handsome Lake, and other Indians of earlier times. 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.
301 Biology and Society I: The Biocultural Perspective (also Biological Sciences 301 and Biology and Society 301) Fall. 3 credits. Prerequisites: Anthropology/Biological Sciences/Biology and Society 301 or permission of instructor. An examination of contemporary medical systems from an anthropological perspective and an evaluation of current approaches to the anthropology of medicine.

312 Issues in Biology and Society: The Anthropology of Medicine (also Biology and Society 312) Spring. 4 credits. Prerequisites: Anthropology/Biological Sciences/Biology and Society 301 or permission of instructor. R 2:30–4:30. D. J. Greenwood, D. H. Holmberg. An examination of contemporary medical systems from an anthropological perspective and an evaluation of current approaches to the anthropology of medicine.

313 Urban Anthropology Spring. 4 credits. M W F 9:05. R. J. Smith. An examination of the sociocultural structure and process in urban settings, with emphasis on the role of rural migrants, the relationships of urbanism to political and economic development, the role of voluntary associations, and the adjustment of family and kinship groups to urban life. Asian, African, and Latin American urban centers are emphasized.

314 Applied Anthropology Fall. 4 credits. T R 10:10–11:15. 50-minute sec to be arranged. M. L. Barrett. What anthropology knows or suspects about some general processes of cultural change, and the application of these insights to practical and ethical problems faced by the planning, conditioned, and evaluation of programs of intervention and change.

320 Meaning across Cultures Spring. 4 credits. Not offered 1983–84.

321 Sex and Gender in Cross-Cultural Perspective (also Women’s Studies 321) Fall. 4 credits. M W F 2:30. K. S. March. An introduction to the study of sex roles cross-culturally and to anthropological theories of sex and gender. The course examines various aspects of the place of the sexes in social, political, economic, ideological, and biological systems to emphasize the diversity in gender and sex-role definition around the world.

322 Comparative Religious Systems Spring. 4 credits. T R 1:25–2:15. 50-minute sec to be arranged. A. T. Koch. A survey of anthropological approaches to the study of religion in simple and complex societies. Examines the role of religion in addressing intrinsic strains in personal and social life and in inhibiting or inducing social and cultural change.

323 Kinship and Social Organization Spring. 4 credits. M W F 11:15. B. Lambert. Much of this course is a survey of forms of the family, descent groups, and marriage systems. The role of age and sex in the social structure is also considered. The last part of the course is devoted to a history of the British and American family and to its fate in utopian communities.

325 Images of Exotics Fall. 4 credits. T R 10:10–11:25. J. A. Boon. A survey of the portrayals of European explanations of tribal, Indic, and other non-Western populations. We explore topics across ancient, medieval, Renaissance, Enlightenment, and Romantic-comparative anthropologies, including monstrousities, paradise, degradation, kingship, utopias, hermetics, nature, sexuality, marriage, language, economy, descent, authority, and so forth.

326 Economic Anthropology Fall. 4 credits. Not offered 1983–84.

327 Power and Culture Spring. 4 credits. Not offered 1983–84.

328 Law and Culture Fall. 4 credits. Not offered 1983–84.

387 American Indian Tribal Governments (also Rural Sociology 387) Fall. 4 credits. Prerequisites: Biological Sciences 301 or Anthropology 103, or permission of instructor. W 7:30–9:55 p.m. S. C. Saraydar. This course focuses on the structure of contemporary tribal governments and the ways in which Western governments approach the issues confronting their constituents. The effects of European contact on traditional political organizations are detailed as are the present-day relations of tribal governments to federal and state governments.

329 Special Problems in the Anthropology of Sex and Gender (also Women’s Studies 422 and Biology and Society 329) Fall. 4 credits. R 2:30–4:25. K. S. March. Each year this seminar focuses on a particular area in the anthropology of sex and gender, building on work done in Anthropology/Women’s Studies 221. The topic for fall 1983 will be women in international development. The seminar will look at the integration of women into development planning and projects: the confrontation between the feminization of development and development of countries, political rights and participation, land reform, credit, agricultural extension services, technological change, small and large-scale enterprises, and so forth. Films screened will be from Asia, Africa, Latin America, and the United States. Films will be selected by the students in consultation with the instructor.

424 Myth, Ritual, and Sign Fall. 4 credits. T R 10:10–11:25. 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.

425 Ritual Structures and Cultural Pluralism Fall. 4 credits. Enrollment limited. S-U grades strongly recommended. T R 2:30–4:25. 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 Samantha Tell's Her Story. The photography of Arbus, the sculpture of Giacometti, and the painting of Kahlo are examined critically. The second half of the semester is devoted to one-hour critiques of the work of each student.

453 Constructions and Visualizations Fall. 4 credits. Not offered 1983–84.


455 Theatre of Anthropology Spring. 4 credits. Not offered 1983–84.

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 showing them the practice of ethnographers. 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 that may at first seem peripheral, such as music viewing, listening to music, and playing video games, will be looked at for the role they play in education. The place of money and commodities will also be examined.

412 Contemporary Anthropological Theory Fall. 4 credits. M W F 11:15. B. Lambert. A survey of the assumptions social anthropologists make concerning the nature of society and culture, and the explanations 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, ethnoscience, and structuralism.

413 History of Anthropology in the United States Fall. 4 credits. Not offered 1983–84.


VIII. Related Courses in Other Departments

Introduction to Archaeology (Archaeology 100)

Popular Archaeology (Archaeology 107)

Individual Study in Archaeology and Related Fields (Archaeology 300)

Human Paleontology (Biological Sciences 371)

Laboratory and Field Methods in Human Biology (Biological Sciences 474)

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

Interpersonal and Social Stress and Coping (Psychology 486)

Subsistence Agriculture in Transition (Rural Sociology 357)

Cross-Cultural Psychology (Sociology 384 and Psychology 384)

IX. Graduate Seminars

600-level courses are open to undergraduates who have fulfilled the prerequisites or by consent of the instructor.

Southeast Asia Seminar: Malaysia (Asian Studies 601)

Southeast Asia Seminar: Indonesia (Asian Studies 602)

Contemporary Sociological Theories of Development (Rural Sociology 606)

607–608 Special Problems in Anthropology

611 Principles of Social Anthropological Theory

612 History of Anthropological Thought

Methods of Assessing Physical Growth in Children (Nutritional Sciences 612)

619 Anthropological Approaches to the Study of Buddhism in Asia

626 Problems in Economic Anthropology

627 Legal Anthropology

628 Political Anthropology (also Government 647)


Anthropometric Assessment (Nutritional Sciences 630)

632 Andean Symbolism Fall. 4 credits. Prerequisite: Reading knowledge of Spanish. Hours to be arranged. B. J. Isbell, C. Morris. Various approaches to symbolism will be applied to archaeological data from the Andean region: architecture and site plans, and the iconography on textiles and ceramics will be discussed.

633 Andean Research Fall or spring. 4 credits. Not offered 1983–84.

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, A. T. Kirsch, J. T. Siegel.

645 Japanese Ethnology Spring 4 credits. R. 2–4. 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.


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. 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 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.

658 Problems in Archaeology: Agricultural Origins Fall. 4 credits. T 2:30–4:25. T. F. Lynch. The topic will be considered in historical perspective as it has been dealt with by botanists, geographers, and anthropologists. The emphasis will be on agricultural systems rather than plant animal morphology and taxonomy. The geographical focus will be South America, with special attention to the Andes.

664 Problems in Archaeology: Early Man in America Spring. 4 credits. Prerequisite: Anthropology 354 or permission of instructor M 2:30–4:25. T. F. Lynch. The subject will be considered in historical perspective as it has been dealt with by archaeologists, geologists, and paleontologists. Emphasis will be on contextual analysis and environmental adaptations rather than chronology, and topics will be drawn from both North and South American archaeology.

666 The Discovery of America Fall. 4 credits. Not offered 1983–84.


The course focuses on Indonesia and other areas with Hindu-Buddhist and Islamic religious traditions. We examine ethnographies and novels that portray complexities of ritual, marriage, rank, and ethnic, religious, or cross-cian stereotypes. Colonial and postcolonial works by Bateson, Hocart, Rassers, Geertz, Dumont, Mullatu, Forster, and others are considered.

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 about distinctive features of the acculturation, social organization, and economic and political development of the north- and south-facing people. 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 Northern Iroquois (also Agriculture and Life Sciences 318) Spring. 3 credits. M W F 3:35. J. T. Siegel.

From accounts of neighboring groups in southern Ontario and western New England to provide a regional perspective and to fill gaps in the chronicles of the early contact period.

[331 The United States Spring. 4 credits. Not offered 1983–84.]

[332 Ethnology of the Andean Region Fall. 4 credits. Not offered 1983–84.]


Peoples and cultures of Indonesia and the Philippines will be discussed, focusing on politics in its linguistic dimensions, as well as economic and cultural processes.

[335 Ethnology of Mainland Southeast Asia Fall. 4 credits. Not offered 1983–84.]

[336 Ethnology of Oceania Fall. 4 credits. Not offered 1983–84.]

342 Culture and Society in South Asia Fall. 4 credits. Not offered 1983–84.


345 Japanese Society Fall. 4 credits. M W F 5:05. 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.

[342 Indians of Mexico and Central America Spring. 4 credits. Not offered 1983–84.]

[343 Andean Thought and Culture Spring. 4 credits. Not offered 1983–84.]


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 Maya religion and history.
Introduction to Ethnomusicology (Music 680)

677 Topics in Ecological Anthropology Fall. 4 credits. R S. 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.

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, p. 173

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 broad range of archaeology in terms of area and time, and deals with method as well as results. Since the major draws upon the teaching and research interests of faculty from many departments in order to present a broad view of the archaeological process, a student interested in the archaeology major should discuss his or her course of study with a participating faculty member as early as possible. In some areas of specialization, intensive language training should be coordinated with other studies as early as the freshman year.

As prerequisite to the major a student must complete Archaeology 100. Once admitted to the major, the student must take an additional 36 credits in courses from the archaeology list, chosen in consultation with the major adviser. These courses should provide exposure to a broad range of archaeologically known cultures and the methods of revealing and interpreting them. They must be distributed as follows:

1) At least two courses from each of the categories below (totaling at least 30 credits, including 16 at the 300 level or above):
   - Theory and Interdisciplinary Approaches (B)
   - Old World Archaeology (C)
   - New World Archaeology (D)
2) At least two courses from Related Courses (E)

Honors. Honors in archaeology is awarded on the basis of the quality of an honors essay and the student's overall academic record. Candidates for the honors program should consult with the director of undergraduate studies before the beginning of the senior year. The honors essay is normally prepared in consultation with a faculty adviser during the senior year; students may enroll in Archaeology 300 for this purpose.

Fieldwork. Every student should gain some practical experience in archaeological fieldwork on a project authorized by his or her adviser. This requirement may be waived in exceptional circumstances. The Jacob and Hedwig Hirsch bequest provides support for a limited number of students to work at excavations sponsored by Cornell and other approved institutions.

The Concentration

Students in Cornell schools and colleges other than Arts and Sciences may elect a concentration in Archaeology. To concentrate in archaeology, the student must complete Archaeology 100 with a grade of C or better and at least four advanced courses in archaeology, distributed among the three groups stipulated in (1) in the description of the major above. Concentrators are eligible for Hirsch Scholarships in support of fieldwork.

Freshman Seminars

107 Popular Archaeology Fall and spring. 3 credits. Freshman Seminar.

109 Archaeoastronomy Not offered 1983–84

111 Indian Lifeways of Ancient North America Not offered 1983–84

116 The Discovery of America (Anthropology 250) Not offered 1983–84

Freshman Seminar in Classical Archaeology

121 For description see Classics Department listing.

A. Introductory Courses and Independent Study Courses

100 Introduction to Archaeology Spring. 3 credits. M W F 1:25. T. P. Volman.

A broad introduction to archaeology—the study of 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. R 12:20–1:10. T. P. Volman.

A series of practical and special topics. The section includes exposure to archaeological materials, an introduction to mapping and recording, special lectures by Cornell faculty and outside visitors, and visits to campus research facilities.

B. Theory and Interdisciplinary Approaches

202 Early People: Human Cultural and Biological Evolution (also Anthropology 203) Fall. 3 credits.

A survey of the archaeological and fossil record of human evolution. Contributions by researchers from a variety of disciplines are highlighted, as are the discoveries, personalities, and controversies that have 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.

358 Archaeological Research Methods (also Anthropology 358) Not offered 1983–84

401 Evolution of Prehistoric Technology Not offered 1983–84

Ancient Societies (Anthropology 118) Fall.

[The Earliest Civilizations (Anthropology 250) Not offered 1983–84]

Investigation of Andean Institutions: Archaeological Strategies (Anthropology 435) Not offered 1983–84

Archaeology 105

[Seminar in Archaeology (Anthropology 499) Not offered in 1983–84]

Seminar in Archaeology: Settlement Archaeology (Anthropology 494) Spring.

Problems in Archaeology: Agricultural Origins (Anthropology 663) Fall.

Problems in Archaeology: Early Man In America (Anthropology 664) Spring

[Architectural Problems in Archaeological Fieldwork (Architectura 540) Not offered 1983–84]

Dendrochronology of the Aegean (Classics 309) Fall.

Geomorphology (Geological Sciences 345) Fall.
C. Old World Archaeology

- [309] Archaeology of Africa: From Human Origins to Iron Age States (Not offered 1983–84)
- [Rise of Classical Greece (Classics 206) Not offered 1983–84]
- Introduction to Art History: Art of the Classical World (Classics 220 and History of Art 220) Fall.
- Minoan-Mycenaean Art and Archaeology (Classics 221 and History of Art 221) Not offered 1983–84.

Archaeology in Action I (Classics 232) Fall
- Archaeology in Action II (Classics 233) Spring.
- [Arts and Monuments of Athens (Classics 320 and History of Art 320) Not offered 1983–84]
- [Archaeology of Cyprus (Classics 321 and History of Art 321) Not offered 1983–84]
- [Greek Architecture (Classics 328) Not offered 1983–84]
- [Greek Sculpture (Classics 329 and History of Art 329) Not offered 1983–84]
- Seminar in Classical Archaeology (Classics 629) Fall.
- [Seminar in Classical Greek Archaeology (Classics 630) Not offered 1983–84]
- [Arts of the Roman Empire (History of Art 322) Not offered 1983–84]
- Painting in the Greek and Roman World (History of Art 323 and Classics 323) Spring.
- Greek and Roman Coins (History of Art 327 and Classics 327) Fall.
- [Art in Pompeii: Origins and Echoes (History of Art 330) Not offered 1983–84]
- [The History and Archaeology of Ancient Israel (Near Eastern Studies 243) Not offered 1983–84]
- [Introduction to Art History: Art of Egypt and Mesopotamia (Near Eastern Studies 248 and History of Art 211) Not offered 1983–84]
- [Ancient Seafaring (Near Eastern Studies 261 and Archaeology 275) Not offered 1983–84]
- History and Archaeology of Ebla (Near Eastern Studies 362 and Archaeology 362) Spring.
- The History and Archaeology of the Ancient Near East (Near Eastern Studies 366 and Archaeology 310) Fall.
- [History and Archaeology of Ancient Egypt (Near Eastern Studies 367) Not offered 1983–84]

D. New World Archaeology

- [361] Field Archaeology in South America (also Anthropology 361) Not offered 1983–84
- The Peopling of America (Anthropology 354) Fall
- Archaeology of Mexico and Central America (Anthropology 355) Spring
- The Archaeology of South America (Anthropology 356) Spring.
- Mesoamerican Thought (Anthropology 466) Fall
- [Andean Systems of Production (Anthropology 630) Not offered 1983–84]
- Andean Symbolism (Anthropology 632) Fall
- [Andean Research (Anthropology 633) Not offered 1983–84]

E. Related Courses for Archaeology Majors

Plane Surveying (Agricultural Engineering 221)
- Nature and Properties of Soils (Agronomy 260)
- Identification, Appraisal, and Geography of Soils (Agronomy 361)
- Geography and Appraisal of Soils of the Tropics (Agronomy 471)
- Use of Soil Information and Maps as Resource Inventories (Agronomy 506)
- [Morphology, Genesis, and Classification of Soils (Agronomy 663) Not offered 1983–84]
- American Indian Philosophies I: Power and World Views (Anthropology 242 and Rural Sociology 242)
- Ethnology of the Northern Iroquois (Anthropology 318 and Agriculture and Life Sciences 318)
- [Ethnology of the Andean Region (Anthropology 333) Not offered 1983–84]
- [Ethnology of Oceania (Anthropology 336) Not offered 1983–84]
- American Indian Tribal Governments (Anthropology 367 and Rural Sociology 367)
- [Indians of Mexico and Central America (Anthropology 422) Not offered 1983–84]
- [Andean Thought and Culture (Anthropology 433) Not offered 1983–84]
- American Indian Philosophies II: Selected Topics (Anthropology 442 and Rural Sociology 442)
- [Discovery of America (Anthropology 666) Not offered 1983–84]
- Introductory Photo I (Architecture 251 and Art 161)
- Color Photography (Architecture 350 and Art 263)
- Introductory Photo II (Architecture 351 and Art 261)
- Case Studies in Preservation Planning (Architecture 544)
- Documentation for Preservation Planning (Architecture 546)
- Remote Sensing: Environmental Applications (Civil and Environmental Engineering 611)
- Image Analysis I I. Landforms (Civil and Environmental Engineering 613)
- The Greek Experience (Classics 211) Fall.
- The Roman Experience (Classics 212) Spring.
- The Individual and Society in Classical Athens (Classics 222) Not offered 1983–84
- [Greek and Roman Mystery Religions (Classics 237) Not offered 1983–84]
- Computer Science 100, 101, and 211 may be of interest to some students (see the departmental listing for information about sequences and combinations).
- Scientific Illustration (Floriculture 417)
- Introductory Geological Science (Geological Sciences 101) Fall or spring.
- Introduction to Historical Geology (Geological Sciences 102)
- [Earth Science (Geological Sciences 103) Not offered 1983–84]
- [Earth Science Laboratory (Geological Sciences 105) Not offered 1983–84]
- Structural Geology and Sedimentation (Geological Sciences 325)
- Sedimentology and Stratigraphy (Geological Sciences 376)
- Glacial and Quaternary Geology (Geological Sciences 642)
- Ancient Greece from Homer to Alexander (History 265) Fall.
- The Greek City from Alexander to Augustus, 323 B.C.-A.D. 14 (History 373)
- Indochina and the Archipelago to the Fourteenth Century (History 395) Fall.
- [The Tragedy of Classical Athens (History 452) Not offered 1983–84]
- The Crisis of the Greek City-State (History 453)
- Introductory Statistics for the Social Sciences (Industrial and Labor Relations 510)
- Hittite (Linguistics 621–622)
- Elementary Statistics (Mathematics 372)
- Statistics (Mathematics 472–473)
- Ancient Near Eastern Literature (Near Eastern Studies 332)
- Elementary Akkadian (Near Eastern Studies 333–334)
- Readings in Akkadian (Near Eastern Studies 335)
- [Folklore in the Ancient Near East (Near Eastern Studies 336) Not offered 1983–84]

Asian Studies

B. de Bary, chairperson and director of undergraduate studies (388 Rockefeller Hall, 256-6095).
- M. Hatch, C. Hirschman, D. Holmberg, F. E. Huffman.
- M. Katzenstein, G. B. Kelley, K. A. Kennedy.

Note: This list includes courses offered during the academic year 1983-84. Some courses may have been offered in previous years, and offerings may have changed since then. For the most current information, please consult the university's current course catalog or contact the department directly.
Asian Studies 107

307 Asian Dance and Dance Drama (also Theatre Arts 307) Fall or spring. 3 credits. May be repeated for credit. [Section 1: Indian Dance. Not offered 1983–84. Section 2: Japanese Noh Theater. Not offered 1983–84.] M W F 1-1:25. Urip S. Maeny and staff. Readings, lectures, and practice sessions in Indonesian dance. On Fridays there will be lectures, demonstrations and discussions on the histories and choreographies of several traditions of dance and dance drama in Indonesia. Videotapes and films will be shown. The Monday and Wednesday classes will consist of lessons in dance and will focus on the performance of Javanese style from repertoires of solo and group dances and dance dramas. These sessions will begin with the basic vocabulary of movement and proceed to the specific dances. No previous experience in dance is necessary.

310 Readings in Korean Literature Fall. 3 credits. 5 hours to be arranged. A survey of works of literature most notably exemplifying the Korean cultural identity. Premodern works will include The Song of Ch’ongyong, The Story of Chunhyang, and selected kasa and ajyo poems. Modern works will also include Nobel 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.


351 Early Buddhism Fall. 4 credits. T R 2:30–3:45. B. Faure. Principles, practices, and goals of Indian Buddhism from Sakayamuni to the rise and establishment of early Mahayana movements. The first part of the course will focus on the life and teachings of Sakayamuni and the practices of early monastic Buddhism as seen from scriptural and archaeological sources. The second part of the course will concentrate on the spread of Buddhism throughout India, with attention to the role of Central Asian borderlands in the introduction of new concepts and the rise of new religious movements. The influence of Buddhism on Indian culture—including art and architecture, literature, medicine, and statecraft—will also be studied. Two guided papers and a final exam.

352 Mahayana Buddhism Spring. 4 credits. No prerequisites; Asian Studies 250 or Asian Studies 351 strongly recommended. T R 2:30–3:45. B. Faure. Principles, practices, and goals of later Buddhist in the northern Buddhist countries of China, Japan, and Tibet. Special focus on the transmission of Buddhism to these countries, its confrontation with native religious traditions, and the resulting adaptations and transformations. Important scriptures, tenets of major schools, lives of eminent teachers. Influence of Buddhism on Far Eastern culture (art, music, literature, etc.). Two guided papers and a final exam.

355 Japanese Religions Fall. 4 credits. Not offered 1983–84.}

The University of Cornell
20th-Century Chinese Literature Fall 4 credits. T R 1:25, disc to be arranged. 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.

Chinese Narrative Literature Spring 4 credits. Hours to be arranged. E. M. Gunn. Selected works in classical Chinese fiction are read in translation. Major novels such as the Dream of the Red Chamber and Water Margin are emphasized.

Japanese Poetry and Drama Spring 4 credits. M W F 12:20–1:45 plus one hour to be arranged. D. de Bary. The major Japanese novelists and short story writers of the twentieth century are studied in translation.


The Japanese Noh Theatre and Modern Dramatists (also Comparative Literature 400) Fall 4 credits. M W 2:30–4. K. Brazell. Several weeks will be spent studying the literary, performance, and aesthetic aspects of the noh theatre. Emphasis will be on nōh as a performance system, a total theatre in which music, dance, text, costume, and props all interact to create the total effect. Then attention will turn to modern theatre people who have reacted to nōh in some creative way. Choice of dramatists will depend partly on the faculty representative.

Asian—General Courses

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.

Asian Studies Honors: Senior Essay Fall or spring. 4 credits. Prerequisite: permission of instructor. The student, under faculty direction, prepares an honors essay.

Asian Studies Supervised Reading Fall, spring, or both. 4 credits. Prerequisite: permission of instructor. Open to majors and other qualified students. Intensive reading under the direction of a member of the staff.

Master of Arts Seminar in East Asian Studies Fall, fall, 2–4 credits. Hours to be arranged. Staff.

Directed Research Fall, spring. 4–8 credits. Credit to be arranged. Staff.

Related Courses in Other Divisions


Politics in Contemporary Japan (Government 346) Not offered 1983–84.


Comparative Revolutions (Government 350) Not offered 1983–84.

The United States and Asia (Government 367) Not offered 1983–84.

Economics of Agricultural Development (Government 464)

Food, Population, and Employment (Government 466)

Architecture in Its Cultural Context (Architecture 470)

Communication in the Developing Nations (Communication Arts 624)


China—Area Courses

Economics of China Spring 4 credits. M W 2:30–3:45. J. Nickum. 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 problems and prospects in light of the major issues of China's economic history and previous and current economic institutions and policies. Seminar format.

A Documentary Study of Contemporary China Spring. 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 credit for those who wish to read the original Chinese.


Comparative Revolutions (Government 350) Not offered 1983–84.

The Foreign Policy of China (Government 390) Not offered 1983–84.


Chinese Political Readings (Government 448) Not offered 1983–84.


Introduction to Asian Civilizations in the Modern Period (History 191) Not offered 1983–84.

Introduction to Art History: Asian Traditions (History of Art 280) Not offered 1983–84.

Buddhist Art in Asia (History of Art 381) Not offered 1983–84.

Studies in Indian and Southeast Asian Art (History of Art 385) Not offered 1983–84.

Ceramic Art of Asia (History of Art 482) Not offered 1983–84.

The courses listed below will count as College of Arts and Sciences credit only for Asian studies majors.

Asian Bibliography and Methodology Fall. 1 credit. Prerequisite: permission of instructor. Required of honors students and master of arts candidates.

Chinese and Japanese Bibliography and Methodology Fall. 1 credit. Prerequisite: permission of instructor. Required of honors students and master of arts candidates.

History 190 (History 190) Not offered 1983–84.
China—one of the world's oldest civilizations—has been an integral part of human history for thousands of years. Its rich cultural heritage and diverse geographical landscape have influenced not only China itself but also neighboring countries and regions.

### China—Literature Courses

#### Introduction to Classical Chinese

- **Chinese Philosophical Texts** (Chinese 313)
- **Classical Narrative Texts** (Chinese 314)
- **Readings in Modern Chinese Literature** (Chinese 411–412)

#### T'ang and Sung Poetry

- **Poetry** (Chinese 420)

#### Directed Study

- **Readings in Literary Criticism** (Chinese 424)

#### Folk Literature

- **Seminar in Folk Literature** (Chinese 609)

#### Japan—Area Courses

- **Politics in Contemporary Japan** (Government 346)
- **Business and Labor in Politics** (Government 334)
- **Japan—Area Courses**
  - **Culture and Society in South Asia** (Anthropology 313)
  - **Japanese Ethnology** (Anthropology 645)
  - **Seminar in Classical Literature** (Japanese 611)
  - **Introduction to Modern Literary Japanese** (Japanese 406)
  - **Politics in Contemporary Japan** (Government 389)
  - **Japanese Communicative Competence** (Japanese 303–304)

#### China—Language Courses

- **Intermediate Chinese II** (Chinese 303–304)

### Japan—Language Courses

- **Japanese Society (Anthropology 345)**

### Linguistic Structure of Chinese: Syntax

- **Chinese Dialects** (Chinese 405)

### History of Japan to 1750

- **History of Modern Japan** (History 398)

### Advanced Directed Readings

- **History in Tokugawa Thought and Culture** (History 489)

### South Asia—Area Courses

- **Architecture in Its Cultural Context** (Architecture 687–688)

### Additional Resources

- **Culture and Society in South Asia** (Anthropology 342)
- **History of the Chinese Language** (Chinese 401)
- **History of China up to Modern Times** (History 393)
- **History of China in Modern Times** (History 394)
- **History of China to 1750** (History 397)
- **History of Modern Japan** (History 490)
South Asia—Language Courses

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 303-304) Not offered 1983-84]

Advanced Hindi Readings (Hindi 305-308)

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

Microeconomic Issues in Agricultural Development (Agricultural Economics 664)

Sociotechnical Aspects of Irrigation (Agricultural Economics 754, Agricultural Engineering 771, and Rural Sociology 754)

Ethnographic Description (Anthropology 306)

Applied Anthropology (Anthropology 314 and Rural Sociology 355)

[Meaning across Cultures (Anthropology 320) Not offered 1983-84]

Comparative Religious Systems (Anthropology 322)

Ethnology of Island Southeast Asia (Anthropology 334)

[Ethnology of Mainland Southeast Asia (Anthropology 335) Not offered 1983-84]

Myth, Ritual, and Symbol (Anthropology 424)

Ritual Structures and Cultural Pluralism (Anthropology 425)

Anthropological Approaches to the Study of Buddhism In Asia (Anthropology 619)

Political Anthropology: Indonesia (Anthropology 628 and Government 647)

Southeast Asia: Readings in Special Problems (Anthropology 634-635)

Southeast Asia Seminar: Malaysia (Asian Studies 601) Fall, 4 credits; R 3:30-5:30 C. Hirschman

Southeast Asia Seminar: Indonesia (Asian Studies 602) Spring, 4 credits; Hours to be arranged. B. R. Anderson

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.

The International Business Environment: Southeast Asia (Business and Public Administration NEC 509)

Southeast Asia Undergraduate Seminar (Government 300)

Government and Politics of Southeast Asia (Government 344) Not offered 1983-84]

The United States and Asia (Government 387)

Political Anthropology: Indonesia (Government 647 and Anthropology 628)

International Relations of Asia (Government 687)

Introduction to Asian Civilization: Modern Period (History 191)

Southeast Asian History of the Fourteenth Century: Indochina and the Archipelago to the Fourteenth Century (History 395)

[Southeast Asian History from the Fifteenth Century (History 396) Not offered 1983-84]

Historiography of Southeast Asia (History 695-696)

[Seminar in Southeast Asian History (History 795-796) Not offered 1983-84]

[Art In Landscape: The Traditional Arts of Southeast Asia (History of Art 106) Not offered 1983-84]

Introduction to Art History: Asian Traditions (History of Art 280)

[Buddhist Art In Asia (History of Art 381) Not offered 1983-84]

[Studies In Indian and Southeast Asian Art (History of Art 386) Not offered 1983-84]

[Traditional Arts in Thailand (History of Art 388) Not offered 1983-84]

[Ceramic Art of Asia (History of Art 482)

Problems Methodology Seminar (History of Art 505)

Comparative Methodology (Linguistics 404)

Sociolinguistics (Linguistics 405-406)

Field Methods (Linguistics 600)

Old Javanese (Linguistics 651-652)

Seminar In Southeast Asian Languages (Linguistics 653-654)

Malayo-Polynesian Linguistics (Linguistics 655-656)

Seminar In Austro-Asiatic Linguistics (Linguistics 657-658)

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)

Introduction to Ethnomusicology (Music 680)

Rural Sociology and World Development Problems (Rural Sociology 105)

Rural Development and Cultural Change (Rural Sociology 355)

Subsistence Agriculture in Transition (Rural Sociology 357)

Sociotechnical Aspects of Irrigation (Rural Sociology 754, Agricultural Economics 754, and Agricultural Engineering 771)

Race and Ethnicity (Sociology 364)

Social and Demographic Change In Southeast Asia (Sociology 400)

Other courses dealing with Southeast Asia are Agricultural Economics 660 and 701; Agricultural Engineering 771 and 774; Agronomy 401; Architecture 667-668; Asian Studies 250, 351, 352, and 650; Business and Public Administration NCE 514; Communication Arts 624; Education 782 and 783; Government 692; History 190; International Agriculture 601, 602, 603, and 703; Nutritional Sciences 680 and 685; and Rural Sociology 430.

Southeast Asia—Language Courses

Basic Course (Burmese 101-102)

Burmese Reading (Burmese 201-202)

Composition and Conversation (Burmese 203-204)

Advanced Burmese Reading (Burmese 301-302)

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)

Structure of Cambodian (Cambodian 404)
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)
Basic Course (Thai 101–102)
Thai Reading (Thai 201–202)
Composition and Conversation (Thai 203–204)
Advanced Thai (Thai 301–302)
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


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 large optical observatories and the world’s largest radio telescope at Arecibo, Puerto Rico.

The department offers a number of courses that are of general interest, have few or no prerequisites, and are not intended for the training of professional astronomers. These courses are numbered from 101 to 332. The last of these, Astronomy 332, requires calculus and a year of college physics, and Astronomy 111–112 require at least coregistration in beginning calculus. The other courses have no prerequisite at all.

Courses numbered above 400 are intended for students who have had two to three years of college physics and at least two years of college mathematics. Astronomy 440, Independent Study, permits students to engage in individual research projects under the guidance of a faculty member.

There is no undergraduate major in astronomy at Cornell because the department believes that a major in physics and mathematics is the best preparation for the study of astronomy at the graduate level. Students who are interested in becoming astronomers should major in physics as undergraduates. It is wise to get an early start in mathematics and physics, preferably by registering for Mathematics 191–192 or 193–194 or 111–112 in the freshman year and by taking Physics 112 as soon as the prerequisites have been completed.

Concentration

Students interested in astronomy are encouraged to supplement their major with a concentration in astronomy, which is somewhat less intensive than a major. All students are invited to visit the Space Sciences Building, see the exhibits on display there, and consult a faculty member about career plans or choice of courses.

Distribution Requirement

The distribution requirement in physical sciences is met by either of the following two sequences: Astronomy 101 and 102 or Astronomy 111 and 112.

Courses

101 The Universe beyond the Solar System Fall 4 credits
Lecs, M W F 11:15; lab, M T W or R 7:30–10 p.m., or T 2:30–5. One lab every other week.
Y. Terzian. Labs, P. Gierasch.
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: high school algebra and Astronomy 101 or permission of instructor.
Lecs, M W F 11:15, lab, M T W or R 7:30–10 p.m., or T 2:30–5. One lab every other week.
Exams may be given in the evening. J. Veverka. Labs, P. Gierasch.

103 The Universe beyond the Solar System Fall 3 credits
Identical to Astronomy 101 except for omission of the laboratory (see description above). This course does not satisfy the distribution requirement in physical sciences.

104 Our Solar System Spring 3 credits
Identical to Astronomy 102 except for omission of the laboratory (see description above). This course does not satisfy the distribution requirement in physical sciences.

105 An Introduction to the Universe Summer 3 credits
M–F 11–12:15, evening laboratories. Staff.
How do we measure the size of our galaxy and the size of the universe? Is the universe round or flat? How are the stars born, why do they shine, and how do they die? What are the chemical elements and how were they formed in stars? What are quasars, pulsars, and black holes? How was the solar system formed? What are the environments of other planets? What is the basic structure of Earth and the other planets? Will man catastrophically alter the earth? Does life exist elsewhere in the universe? How can we find it? Each student has an opportunity to make observations with small telescopes.

106 Essential Ideas in Relativity and Cosmology Summer 3 credits
Prerequisites: high school algebra and trigonometry.
M–F 9:30–10:45, Staff.
Einstein’s theories of special and general relativity, which brought about a fundamental change in our conceptual understanding of space and time, will be studied. Correspondence to, and conflicts with, common sense will be pointed out. Applications to various areas will be studied in special relativity—space travel, equivalence of mass and energy, nuclear fission and fusion, and thermonuclear processes in the sun; in general relativity—motion of light and particles in curved space-time, cosmological models, and the question of whether the universe is open or closed.

111 Astronomy: Stars, Galaxies, and Cosmology 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; plus some evening observing periods.
I. Wasserman.

112 The Solar System, Planets, and Life Fall 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.
S. Ostro.

201 Our Home in the Universe Fall 2 credits
T R 2:30–3:45, T. Gold.
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 Fall 4 credits
Topics to be covered include the exact and probabilistic laws of nature, messages, information content, and entropy; the Heisenberg uncertainty principle as a fundamental limitation on what we can known about the behavior of physical systems; coding of messages, cryptography, unbreakable codes, error-correcting codes, self-replicating machines; transmission of genetic information in biology; mutations and biological evolution; transmission, storage, and processing of information in machines and animals; robots and artificial intelligence.
Introduction to Astrophysics and Space Sciences I  Fall. 4 credits.

Introduction to Astrophysics and Space Sciences II  Spring. 4 credits. Prerequisite Astronomy 431 or permission of instructor.
MWF 10:10. S. Beckwith.
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 Astrophyysical Concepts, by Harwit.

Introduction to Astrophysics and Space Sciences 4 credits.
MWF 11:15. J. Velevka.
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 of the primeval solar nebula. A critical assessment is made of how well the various theories account for the clues left in the meteorite record and how well they explain the current environments of the planets and satellites. The reasons about the formation and evolution of terrestrial planets, satellite systems, and asteroids are considered in detail. Some specific topics included are the history of the earth-moon system, the probable evolution of Jupiter's Galilean satellites, and the comparative histories of Venus, Earth, and Mars.

Independent Study in Astronomy  Fall or spring. 2-4 credits. Prerequisite: permission of instructor. Recommended: familiarity with the topics covered in Astronomy 332, 431, or 434.
440 Independent Study in Astronomy  Fall or spring. 2-4 credits. Prerequisite: permission of instructor. Recommended: familiarity with the topics covered in Astronomy 332, 431, or 434.
440 Independent Study in Astronomy  Fall or spring. 2-4 credits. Prerequisite: permission of instructor. Recommended: familiarity with the topics covered in Astronomy 332, 431, or 434.

General Relativity (also Physics 553)  Fall. Not offered 1983–84.
509 General Relativity (also Physics 553)  Fall. Not offered 1983–84.


High-Energy Astrophysics  Spring. 4 credits.
T, R, hours to be arranged. S. Teukolsky.


Radio and Radar Astronomy  Fall. 4 credits.
T, R 2:30–3:45. F. Drake, S. Ostro.
Radio astronomy telescopes and electronics. antenna theory; observing procedures and data analysis; radio astronomy concepts and analysis; interstellar and extragalactic radio systems. Presentation of fundamental physical principles to compact objects. No astronomy or general relativity prerequisites. Text: Physics of Black Holes, White Dwarfs, and Neutron Stars, by Shapiro and Teukolsky.

Radio Astrophysics  Spring. 4 credits.
T, R hours to be arranged. J. Cordes.


The Sun  Fall. 4 credits.
The sun as a star, stellar evolution, neutrinos from the sun, solar seismology. The solar surface and magnetic field, the dynamo, solar flares and eruptions, plasma phenomena, energetics of the corona. Solar terrestrial influences, the solar spectrum, the solar wind, interplanetary phenomena. At the level of The New Solar Physics, by Eddy.

The Evolution of Planets  Fall. 4 credits.
MWF 11:15. J. Velevka.
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 of the primeval solar nebula. A critical assessment is made of how well the various theories account for the clues left in the meteorite record and how well they explain the current environments of the planets and satellites. The reasons about the formation and evolution of terrestrial planets, satellite systems, and asteroids are considered in detail. Some specific topics included are the history of the earth-moon system, the probable evolution of Jupiter's Galilean satellites, and the comparative histories of Venus, Earth, and Mars.


Planetary Atmospheres  Fall. Not offered 1983–84.
571 Planetary Atmospheres  Fall. Not offered 1983–84.


Advances in Radio Astronomy  Spring. 1 credit.
To be arranged. J. Houck.
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.

Advancing in Infrared Astronomy  Spring. 1 credit.
To be arranged. Staff.
Guided reading and seminars on topics not currently covered in regular courses.

Cosmic Electrodynamics (also Applied and Engineering Physics 608)  Not offered 1983–84.
660 Cosmic Electrodynamics (also Applied and Engineering Physics 608)  Not offered 1983–84.

Special Topics in Planetary Astronomy: The Saturn System  Fall. 4 credits.
In past years the course has focused on such topics as the interiors of planets, the surface and atmosphere of Mars, Voyager exploration of the outer solar system, cosmic organic chemistry and exobiology, and instrumental techniques.


Computational Astrophysics  Spring. 3 credits.
Prerequisites: knowledge of Fortran. Only those students who have completed the fundamental graduate physics courses should consider attending. A course designed to familiarize graduate students with numerical techniques for solving diverse problems in astrophysics. Topics in hydrodynamics will be included as examples of nonlinear phenomena. Numerical methods discussed in the course will include solving ordinary and partial differential equations, linear algebra and eigenvalue problems, Monte Carlo techniques, fast Fourier transforms, etc. Students will be allotted computer time to solve, both individually and in small teams, assigned numerical exercises.

Seminar: Problems in the Interstellar Medium  Spring. 2 credits.
To be arranged. E. Saipeter.
Will cover some topics of current interest, chosen from (1) radiative transfer theory for spectral lines, (2) energy balance of the interstellar gas, (3) formation of molecules, and (4) physics of dust grains.

Biological Sciences

Director, to be named; H. T. Sisson, associate director and director of undergraduate studies (118 Simson Hall, 256-5233), S. D. Miller, assistant director for academic affairs/student services (Biological Center, G209 Simson 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 problems that biology has put before us. At Cornell the program of study in biology 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 program is designed to enable students to acquire necessary scientific foundations, to become familiar with different aspects of modern biology, and then to concentrate in a specific area of biology. Areas of concentration include animal physiology and anatomy; biochemistry; botany; cell biology; ecology; systematics, and evolution; genetics and development, or neurobiology and behavior. Special concentration programs are available for qualified students with particular interest in areas such as biophysics, microbiology, or nutrition. As an alternative to selecting one of the concentration areas, students may choose to complete the Program in General Biology. Students interested in the marine sciences may consult the Cornell Marine Sciences Office (414 Simon Hall, 256-3717) for academic advice and career counseling. For more details see the Division of Biological Sciences section.

Burmese, Cambodian, and Cebuano (Bisayan)

See Modern Languages, Literatures, and Linguistics, p. 192.

Chemistry


The chemistry department offers a full range of courses in physical, organic, inorganic, analytical, theoretical, biologic, and biophysical chemistry. In addition to their teaching interests, chemistry faculty members have active research programs. The link between teaching and research is a vital one in a continuously changing 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, independence in planning, and creativity in the design of experiments. In recent years chemistry majors have gone on to graduate study in chemistry, medicine, law, and business management, as well as directly into positions with chemical, pharmaceutical, and other industrial companies. A major in chemistry can provide the basis for significant work in related areas such as molecular biology, chemical physics, geochemistry, chemical engineering, and solid state physics. A major in chemistry permits considerable flexibility in the detailed planning of a course program. The required courses can be completed in three years, leaving the senior year open for advanced and independent work under the supervision of a professor. The courses are arranged as a progression, with some courses (including mathematics and physics) prerequisite to those that are more advanced. During the first year, those who take effect Chemistry 215-216 is preferred, students may begin their programs with Chemistry 207-208. Chemistry 215-216 is limited to those students with good preparation and a strong interest in chemistry. Students who do not know if their preparation is adequate should consult the instructor. In the second year the student should complete calculus and take physics and organic chemistry (Chemistry 359-360 is preferred to Chemistry 357-358). The second-year laboratory courses include 300, Quantitative Chemistry, if needed, and 301, Experimental Chemistry I: 389-390, Physical Chemistry II; and 302-303, Experimental Chemistry II and ill. which should be completed in the third year. Advanced work in chemistry and related subjects can be pursued in the fourth year and, to some extent, in the earlier years as well. The opportunity for independent research is also available. All students with questions about details of a major program are encouraged to consult the chairperson of the Department of Chemistry or the chairperson's representative. Entering students who are exceptionally well prepared in chemistry may receive advanced placement credit for Chemistry 207-208 and proceed to a more advanced program.

Prerequisites for admission to a major in chemistry are (1) Chemistry 215-216 or 207-208 plus 300, (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. 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 listed below.

1. Chemistry 301, 302, 303, 359-360 (pr, if necessary, 357-358 may be substituted), and 389-390
2. Mathematics 112 plus 214, 215, 216, 217; or 122 plus 221, 222, or 192 plus 293, 294
3. Physics 208

Potential majors electing to take the mathematics sequence 214-217 are strongly urged to do so in their sophomore year to avoid scheduling conflicts with Chemistry 389 in their junior year.

This sequence is a core program in chemistry. It is anticipated that students will, through elective courses, extend it substantially in whatever direction suits their own needs and interests. It is particularly important that those 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 404, 405, 410, 605, 606, 668, and 681, and German to the extent that ot is needed. 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.

Honor. The honors program in chemistry offers superior work to those students who are particularly interested. Students who complete the introductory organic chemistry and physical chemistry sequences by the end of the junior year. However, failure to have completed those courses in the junior year does not in itself disqualify a student from the honors program. Completion of the program at a high level of performance leads to the degree of Bachelor of Arts with honors in chemistry. Students will be admitted to the program by invitation of the department. Selection will be based on a superior cumulative average, including chemistry grades, and good performance in a prior research program. Prospective candidates should discuss their plans with advisers by March 1 of their senior year. Participants are notified by early January of their senior year. To be awarded honors, candidates must show outstanding performance in at least one of their 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 laboratory sessions. Students are strongly urged to commit to the safety program at the first laboratory session. Those who fail to cooperate with the safety program will be asked to leave the laboratories.

Students are required to pay for glassware and any other items broken or missing from their laboratory desks at the close of each semester. Students who fail to inventory their desks at the appointed time in the presence of their instructor are charged a $5 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 less mathematical course than Chemistry 207-208. Not recommended for students who plan to do further work in chemistry subsequent to Chemistry 204. Lecs, M W 11:15 or 12:20; lab, T or R 8-11, or F 10:10-11:00, or M W F 1:25-4:25. Prelims, 7:30-9:00 p.m., Oct., March, April. 12; 1 April, 12.

Fall: H. A. Scheraga, spring, D. A. Usher.

An introduction to chemistry, with emphasis on the important principles and facts of inorganic and organic chemistry.

201 Chemistry of the Environment Fall. 3 credits. Prerequisite: one year of high school or college chemistry. Lee, M W F 12:50, J. R. Wiesenfeld. An introduction to the chemical description of environmental phenomena, with an emphasis on natural geochemical cycles. Effects of perturbations introduced by human activities.

202 Origins of Life Fall. 3 credits. Prerequisite: one year of chemistry or biochemistry. Extra sessions will be held for students with a strong background. S-G grades, letter grades possible after consultation with instructor.

Lecs, T R 12:20-1:30, D. A. Usher.

Birth of solar system and conditions on the early earth: characteristics of molecules essential to life today; prebiotic syntheses of biological molecules and further chemical evolution; origin of protein synthesis and the genetic code; effect of cycles in temperature (day and night, summer and winter) and humidity (dew, rain, tides) on early chemical systems; the rock record; geological and molecular fossils; other possibilities for life; different genetic material and extraterrestrial life. A determined effort is made to distinguish fact from hypothesis and from fiction; there will be much critical reading of the research literature.
252 Elementary Experimental Organic Chemistry
Spring, 2 credits. Recommended for non-chemistry majors. Prerequisite: Chemistry 251.
J. E. McMurry
A continuation of Chemistry 251.

253 Elementary Organic Chemistry Fall
4 credits. Primarily for students in the premedical and biological curricula. Limited to 400 students. Prerequisite: Chemistry 104 with grade of C or better or Chemistry 206 or 216.
Lecs, M W F 10:10; make-up lec may be given in the evening. Thurs 7:30–9 p.m., Sept. 27, Oct. 27, Nov. 29. J. E. McMurry
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.
Note: Because of duplication of material, students are not permitted to earn both 4 credits for Chemistry 253 and 3 credits for Chemistry 357. In special situations (consult instructor for details), students should take Chemistry 253 for 2 credits after having earned 3 credits for Chemistry 357. Premedical students should determine the entrance requirements of the particular medical school they wish to enter. Students may earn 2 credits in Chemistry 287–288, 251–253 or 8 credits by taking Chemistry 253–251 or 253, 251, and 252.

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 286. Chemistry 287.
A systematic treatment of the fundamental principles of physical chemistry.

289–290 Introductory Physical Chemistry Laboratory 289, fall; 290, spring, 2 credits each term. Prerequisite for Chemistry 290. Chemistry 269.
Quantitative and qualitative methods basic to the experimental study of physical chemistry.

300 Quantitative Chemistry Fall 2 credits.
Prerequisite: Chemistry 208 or advanced placement in chemistry.

301 Experimental Chemistry I Spring, 4 credits.
Prerequisite: Chemistry 216 or 300, and 253 or 357 or 359. Concurrent registration in Chemistry 253 is not recommended.
An introduction to synthesis and the separation and handling of materials, including applications of many types of chromatography, simple and fractional distillation, crystallization, extraction, and others.
405 Techniques of Modern Synthetic Chemistry

Spring. 6 credits. Enrollment limited. Prerequisite: Chemistry 302 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. Lect, first week only, at times to be arranged. J. M. Buritch.

The synthesis of complex organic and inorganic molecules are carried out with emphasis on the following techniques: vacuum line, high pressure, high temperature solid-state, inert atmosphere, nonaqueous solvents, radioactive labeling, photochemical and electrochemical methods, solid phase peptide synthesis, and macro and micro techniques. Elementary glassblowing.

410 Inorganic Chemistry

Spring. 4 credits. Prerequisites: Chemistry 358 or 360 and Chemistry 389.


A systematic study of the synthesis, structure, and reactivity of inorganic and organometallic compounds.

421 Introduction to Inorganic Research

Fall or spring. 2-4 credits. Prerequisites: Chemistry 303 and 389–390, or Chemistry 297–298, and Chemistry 289–290 with an average of B- or better, or permission of instructor.

Selected faculty.

Research in inorganic chemistry involving both laboratory and library work, planned in consultation with a faculty member.

433 Introduction to Analytical Research

Fall or spring. 2-4 credits. Prerequisites: Chemistry 303 and 390 with an average of B- or better, or permission of instructor.

Selected faculty.

Research in analytical chemistry involving both laboratory and library work, planned in consultation with a faculty member.

461 Introduction to Organic Research

Fall or spring. 2-4 credits. Enrollment limited to those having a record of a B- or better in prerequisite courses. Prerequisites: Chemistry 302 and 358 or 360 or permission of instructor.

Selected faculty.

Research in organic chemistry involving both laboratory and library work, planned in consultation with a faculty member.

477 Introduction to Research in Physical Chemistry

Fall or spring. 2-4 credits. Prerequisites: Chemistry 390 with an average of B- or better and permission of instructor.

Selected faculty.

Research in physical chemistry involving both laboratory and library work, planned in consultation with a faculty member.

498 Honors Seminar

Spring. No credit. Admission by departmental invitation. Additional prerequisite or corequisites: outstanding performance in either (1) two coherent 4-credit units of research in a course such as Chemistry 421, 433, 461, or 477; or (2) one 4-credit unit in a course such as Chemistry 421, 433, 461, or 477 and summer research equivalent to at least 4 credits in the same subject. J. M. Buritch, M. J. Goldstein.

Informal presentations and discussions of selected topics in which all students participate. Individual research is on advanced problems in chemistry under the guidance of a faculty member, culminating in a written report.

600-601 General Chemistry Colloquium

600, fall; 601, spring. No credit. Required of all graduate students except those majoring in organic or biorganic chemistry. Juniors and seniors are encouraged to attend.

R 4:40. G. H. Hamme.

A series of talks representative of all fields of current research interest in chemistry 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.


This is the first of a three-term sequence. Symmetry and structure of discrete molecules, translational symmetry of arrays of molecules in crystals. Group theory at the level of Cotton’s Chemical Applications of Group Theory and Schönland’s Molecular Symmetry, and Hall’s Group Theory and Symmetry in Chemistry. Applications include molecular orbital theory, hybridization, and molecular vibrations. Readings in 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.


The second of a three-term sequence. Synthesis, structure, and reactivity of organometallic complexes. Emphasis on mechanistic considerations of fundamental processes. An overview of homogeneous catalysis and applications of organonitrogen chemistry in organic synthesis is included. Readings at the level of Colman and Hegedus’ Principles and Applications of Organotransition Metal Chemistry.

607 Advanced Inorganic Chemistry III: Structure and Properties

Spring. 4 credits. Prerequisite: Chemistry 605 or permission of instructor.


The third of a three-term sequence. Introduction to ligand field theory and solid-state structure and properties, at the level of Figgis’ 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.


The production, transmission, and reception of chemical signals in communicative interactions of animals, plants, and microorganisms. Communication involving insects is emphasized. Specific topics are treated, with varying emphasis on chemical, biochemical, neurobiological, ecological, and evolutionary principles.

625 Advanced Analytical Chemistry I

Fall. 4 credits. 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 ultraviolet, infrared, NMR, Raman, and mass spectroscopy are discussed.

[627 Advanced Analytical Chemistry II

Fall. 3 credits. Primarily for graduate students. Prerequisite: Chemistry 288 or 390 or equivalent. Not offered 1983–84.

Lecs. T R 10:10, problem sessions and exams, 7:30 p.m. Modern analytical methods, including electron, Mossbauer, and Fourier spectroscopy. Mass spectrometry; methods applicable to macromolecules, information theory.]

628 Advanced Analytical Chemistry III

Spring. 3 credits. Primarily for graduate students. Prerequisite: Chemistry 288 or 390 or equivalent. Offered alternate years.


Modern trace, micro, and surface methods of analysis, including atomic spectrometry, solid mass spectrometry, activation analysis, microscopes, microprobes, and electron spectroscopy.

650–651 Organic and Organometallic Chemistry Seminar

650, fall; 651, spring. No credit. Required of all graduate students majoring in organic or biorganic chemistry. Juniors and seniors are encouraged to attend.

M 8:15 p.m. D. B. Collum.

A series of talks representative of all fields of current research interest in organic and organometallic chemistry, given by research associates, faculty members, and distinguished visitors.

665 Advanced Organic Chemistry

Fall. 4 credits. Primarily for graduate students and upperclass undergraduates. Prerequisites: Chemistry 253 or 358 and 390 or equivalents or permission of instructor.

Lecs. M W F 12:20, make-up 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. M W F 10:10, additional lec to be arranged. D. C. Collum.

Modern techniques of synthesis, applications of organic reaction mechanisms to the problems encountered in rational multistep synthesis, with particular emphasis on modern developments in synthetic planning.

[667 Chemical Aspects of Biological Processes

Fall. 4 credits. Prerequisites: Chemistry 358 or 360 and 390 or 288 or equivalents. Not offered 1983–84.

Lecs. M W F 10:10. 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. G. G. Hamme.

Protein structure and dynamics, steady-state and transient kinetics; binding isotherms; chemical modification enzymes, NMR, EPR, and fluorescence; acid-base catalysis; allosterism; 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 1983–84.


Properties, synthesis, and 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. disc to be arranged. J. H. Freed.
Development of the general laws of equilibrium and nonequilibrium thermodynamics. Applications to the study of physical-chemical equilibrium and steady states in gases, liquids, solids, and liquid solutions.

786 Physical Chemistry I Fall. 4 credits. Prerequisites: Chemistry 288 or 390; Mathematics 214, 215, 216, 217, and Physics 205, or equivalents.
Lecs, MW F 10:10 and occasionally W 7:30 p.m. M. J. Senko.
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 Karpus and Porter.

791 Spectroscopy Fall. 4 credits. Prerequisites: Chemistry 793, Physics 443, or equivalent.
Schroedinger's equation, wave packets, uncertainty principle, WKB theory, matrix mechanics, orbital and spin angular momentum, exclusion principle, perturbation theory, variational principle, Born-Oppenheimer approximation. At the level of Bohm's Quantum Theory.

793 Quantum Mechanics I Fall. 4 credits. Prerequisites: Chemistry 681, coregistration in Physics 432 and Mathematics 421 or equivalents or permission of instructor.
Principles of linear and nonlinear atomic and molecular optical spectroscopies. Theory will include an introduction to density matrix formalism. Topics will be drawn from the current literature and will include work using highly monochromatic radiation as well as studies based on subpicosecond light pulses.

792 Scattering Theory for Chemists Spring 3 credits. Not offered 1983-84.
Hours to be arranged. G. S. Ezra.
The concepts and methods of scattering theory are described with particular emphasis on applications to problems of chemical interest.

796 Statistical Mechanics (also Physics 562) 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.

816 Selected Topics in Advanced Organic Chemistry Fall. 3 credits. Prerequisite: Chemistry 390 or equivalent. Not offered 1983-84.

870 Selected Topics in Organic Chemistry Fall. 3 credits. Prerequisites: Chemistry 665 or permission of instructor. Not offered 1983-84.
Lecs, MWF 11:15. C. F. Wilcox.
Continues and extends the approach of Chemistry 665 to more complicated organic reactions. Emphasis is on applications of reaction kinetics and isotope effects to gain an understanding of reaction mechanisms.

876 Physical Organic Chemistry I Spring. 4 credits. Primarily for graduate students.
Prerequisite: Chemistry 665 or permission of instructor.
Lecs, MWF 11:15. C. F. Wilcox.
The concepts and methods of scattering theory are described with particular emphasis on applications to problems of chemical interest.

766 Physical Organic Chemistry II Spring. 3 credits. Primarily for graduate students.
Prerequisite: Chemistry 765 or permission of instructor. Not offered 1983-84.
Quantitative aspects of organic chemistry.

866 Physical Chemistry of Proteins Spring. 4 credits. Primarily for graduate students.
Prerequisites: Chemistry 288 or 390 or equivalents. Not offered alternate years.
Lecs, MWF 8, plus one hour to be arranged, and occasionally W 7:30 p.m. H. A. Scheraga.
Chemical constitution, molecular weight, and structural basis of proteins; thermodynamic, hydrodynamic, optical, spectroscopic and electronic properties; protein and enzyme reactions; statistical mechanics of helix-coil transition in biopolymers; conformation of biopolymers: protein folding.

700 Baker Lectures Fall. 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.

701-702 Introductory Graduate Seminar in Analytical, Inorganic, and Physical Chemistry Fall. 1970; spring. No credit. Required of all first-year graduate students majoring in analytical, inorganic, physical, theoretical, and biophysical chemistry. Hours to be arranged. F. W. McAllery.

Chinese
See Department of Asian Studies, p. 109, and Modern Languages, Literatures, and Linguistics, p. 152.

Classics
The Department of Classics offers an interdisciplinary approach to the Greek- and Latin-speaking civilizations of antiquity and to the work of later writers and thinkers who used Latin as their linguistic medium. It also offers, from time to time, courses in other ancient languages of Italy and, even other year, a program in modern Greek. Historical writers, poets, philosophers, and the great architects and artists of Greco-Roman civilization are the subject matter. The department teaches them primarily for their central importance in a humanistic education. The department offers courses in Bronze Age and Classical archaeology and sponsors an archaeological dig at Alambra in Cyprus. Here at Cornell it has a fine collection of ancient artifacts, reproductions of ancient sculpture, and one of the few laboratories in the world that concentrate on the tree-ring dating of ancient monuments from Greece, Cyprus, and Turkey. The archaeology courses may be used to satisfy some of the requirements for the intercollegiate program in archaeology or for the major in Classical civilization. They require no knowledge of either Greek or Latin. Similarly, the department offers a variety of courses and seminars in English on such subjects as Greek mythology, Greek and Roman mystery religions, early Christianity, 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 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 biobexperimental 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.

The 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 and 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 qualification in Latin and Greek or 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 also must 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 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.

Study Abroad

Cornell participates in the Intercolligate 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 selected undergraduates. The American Academy in Rome, of which Cornell is also a member institution, offers regular and summer programs for qualified graduate students. Detailed information on these programs is available in the Department of Classics Office, 120A 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

[100 Word Power: Greek and Latin Elements in the English Language Fall. 3 credits. Not offered 1983–84. G. M. Messing. This course gives the student with no knowledge of Classical languages an understanding of how the Greek and Latin elements, which make up over half our English vocabulary, operate in both literary and scientific English usage. Attention is paid to how words acquire their meaning and to enlarging each student's working knowledge of vocabulary and grammar.]

[102 Word Power for the Biological Sciences Fall. 3 credits. Not offered 1983–84. M. W. 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 pronunciation will generally recognize the basic meaning of any unfamiliar word in this field. Attention will also be paid to misnominations, common errors, and words still in use that reflect scientific theories since rejected.]

211 The Greek Experience Fall. 3 credits. M. W. F 11:15. M. Cook. An introduction to the literature and thought of ancient Greece with 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, also selected prose works, augmented by films, slides, play readings, and individual student interpretations.

212 The Roman Experience Spring. 3 credits. M. W. F 11:15. J. Ginsburg. An introduction to the literature and thought 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.

[222 The Individual and Society in Classical Athens Spring. 3 credits. Prerequisite: Classics 211 or 220 or History 161, 265, or 266 or permission of instructor. Not offered 1983–84. From Classical Athens (fourth century B.C.) to the last four centuries B.C. came many of the most outstanding achievements in Western civilization: in literature, art, philosophy, historical writing, and the sciences. This course will survey Roman daily life and the cultural and social life of the society in an attempt to interpret the civilization and society with a view to isolating aspects that facilitated the development of the individual and individual achievement. Topics will include: family life, education, economics, government, material culture and social life, political and military history, while not totally disregarded, will not be of primary concern.]

[224 Greek Philosophy Fall. 3 credits. Not offered 1983–84. An introduction to the pre-Socratic philosophers and Plato.]

[225 Hellenistic and Roman Philosophy Spring. 3 credits. Not offered 1983–84. An introduction to Aristotle 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. Messing. 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 1983–84. M. W. F 11:15. K. Clinton. The development and character of Mystery cults from the original Mystenia of Demeter and Persophone to the Christian Mysteries. The cults include the Kabiroi, the Great Gods of Samothrace, Dionysus, Osiris, and other cults of Asia Minor and the Near East. Investigation will focus on the distinctive features of the Mystery cults that contributed to their success.]

[238 The Ancient Epic Spring. 3 credits. Not offered 1983–84. M. W. F 11:15. 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 1983–84. M. W. F 12:20. J. G. Ginsburg. Study of historical 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, narrative technique, and accuracy of the Greek and Roman historians, and their attitudes to the events which they relate.]

[300 Greek and Roman Drama (also Comparative Literature 300) Spring. 4 credits. Not offered 1983–84. T R 10:10–11:35. G. M. Kirkwood. A study of ancient tragedy and comedy as exemplified by representative plays. Read translation, of Aeschylus, Sophocles, Euripides, Aristophanes, Menander, Plautus, Terence, and Seneca. Main emphasis is on the development of Greek tragedy. Consideration of also the development of Greek theater (illustrated) and its
relationship to the form and presentation of the drama, the origins of tragedy, and the influence of Greek tragedy and Seneca on later European drama.)

[333 Latin Foundations of Western Literature (also Comparative Literature 333) Spring. 4 credits. Not offered 1983–84.]

The Greeks and Romans first raised many of the central questions that have long preoccupied Western thought: Is belief in a good 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 is scientific thinking just another form of myth? We will examine the cultural, political, and religious contexts in which such questions first arise and assess the distinctly Greek and Roman responses given by Classical tragedians, historians, philosophers, and religious thinkers. Authors examined will include Homer, Heracleitus, Aeschylus, Sophocles, Thucydides, Plato, Aristotle, Epicurus, the Stoics, St. Paul, and Augustine.

[337 Ancient Philosophy of Science Spring. 4 credits. Not offered 1983–84.]

The development of scientific method by the ancient Greeks: the pre-Socratic philosophers, Aristotle, the ancient atomists, and the medical writers (Hippocrates, Galen, and the empiricists.)

[339 Ancient Wit: An Introduction to the Theory and Form of Comic and Satric Writing in Greece and Rome (also Comparative Literature 339) Spring. 4 credits. Not offered 1983–84.]

The aim is not to provide an introduction to the comedy, satire, and other humorous writing in Greek and Roman literature, but to discuss the ancient world of modern theories of comedy and the 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 Koster's The Act of Creation. Examination of select works and passages of Homer, Euripides, Aristophanes, Herocles, Lucian, Plautus, Nonnus, Horace, Martial, Juvenal, and Petronius.

340 Ancient Greek Constitutions Spring. 3 or 4 credits. Prerequisite: survey of Greek history, a course in Greek civilization, ability to read Greek, or permission of instructor. T R 12:20. L. Abel.

The Greek word politia means "organization," 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 Spring. 4 credits. Not offered 1983–84.]

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 the nature of the evidence, basic chronology, and the development of political systems.

465–466 Independent Study in Classical Civilization, Undergraduate Level 465, fall; 466, spring. Up to 4 credits. Hours to be arranged.

[610 Language of Myth (also Anthropology 610) Spring. 4 credits. Not offered 1983–84.]

P. Fucci.

An analysis of the theories on language leading to Levi-Strauss and Derrida.

[681 Patrician Seminar: Graduate Fall or spring. 4 credits. Not offered 1983–84.]

711–712 Independent Study for Graduate Students in Classical Civilization 711, fall; 712, spring. Up to 4 credits. Hours to be arranged.

Greek

101 Greek for Beginners Fall and spring. 4 credits. M W T W F 12:10. Staff.

Introduction to Attic Greek. Designed to enable the student to read the ancient authors as soon as possible.

103 Attic Greek Fall and spring. 4 credits. Prerequisite: Classics 101 or equivalent. M W T W F 12:20. Staff.

A continuation of Classics 101.

111–112 Modern Greek 111, fall; 112, spring. 3 credits. M W F 9:05. G. Messing.

201 Attic Authors Fall. 3 credits. Prerequisite: Classics 103 or equivalent. M W F 1:25. M. Cook.

Selected readings from Plato, Thucydides, and Euripides.

203 Homer Spring. 3 credits. Prerequisite: Classics 103 or equivalent. M W F 9:05. G. Kirkwood.

Readings in the Homeric epic.

204 Plato Spring. 3 credits. Prerequisite: Classics 103 or equivalent. M W F 1:25. Staff.

Selected readings from Plato.

209 Greek Composition Fall. 2 credits. Prerequisite: Classics 203 or equivalent. T R 10:10–11:35. P. Fucci.

210 Greek Composition Spring. 2 credits. Prerequisite: Classics 208 or equivalent. T R 10:10–11:35. P. Fucci.

[340 Greek Historians Fall. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. Not offered 1983–84.]

J. E. Coleman.

Topic varies. In 1981–82 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 1983–84.]

G. M. Kirkwood.

[303 Readings in Greek Rhetoric Fall. 4 credits. M W F 9:05. P. Mitsis.

An examination of the development of Greek rhetorical theory and practice from Anthonius 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 Spring. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. M W F 2:30. M. Cook.

[306 Greek Melic, Elegiac, and Bucolic Poetry Spring. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. Not offered 1983–84.]

G. Kirkwood.

[307 Plato Fall. 4 credits. Prerequisite: Classics 203 or 204 or equivalent. Not offered 1983–84.]


Plato on egoism, love, and friendship: Lyias and Symposium.

[308 New Testament Greek Spring. 4 credits. Prerequisite: two terms of 200-level Greek or permission of instructor. Not offered 1983–84.]

Readings in New Testament texts discussed in seminar format, with one session a week devoted exclusively to problems with language and translation exercises.

[310 Greek Undergraduate Seminar Fall or spring. 4 credits. Prerequisite: two terms of 200-level Greek or permission of instructor.]

L. Abel.

See description under Classical Civilization.

401-402 Independent Study in Greek, Undergraduate Level Fall, 401, fall; 402, spring. Up to 4 credits.

Hours to be arranged.

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. M W F 12:20. P. Fucci.

Readings of Homer comparing the ideas, style, and tone of the Iliad and the Odyssey.

[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. Not offered 1983–84.]

P. Fucci.

419 Advanced Greek Composition Fall. 2 credits. Prerequisite: Classics 209–210, or equivalent. Hours to be arranged. G. M. Messing.

[442 Greek Philosophy Fall or spring. 4 credits. Not offered 1983–84.]


672 Seminar in Greek: Graduate Spring. 4 credits. T 3–5. G. Kirkwood.

701-702 Independent Study for Graduate Students in Greek 701, fall; 702, spring. Up to 4 credits. Hours to be arranged.

Latin


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.
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. Staff.

205 Intermediate Latin Fall. 3 credits.
Prerequisite: Classics 106 or 108 or placement by departmental examination.
Sec 1, M W F 10:10; sec 2, M W F 1:25; J. Ginsburg.
Conspiracy at Rome. Readings from Cicero's four speeches against Catiline, the leader of a plot to seize control of the Roman state. Class discussion will focus on these speeches as examples of the art of persuasion in the Roman world and on the Catilinarian Conspiracy as an historical event.

207 Catullus Spring. 3 credits. Prerequisite: Classics 106 or 108 or one term of 200-level Latin. 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.

208 Roman Drama Spring. 3 credits. Prerequisite: Classics 106 or 108 or one term of 200-level Latin. Not offered 1983–84. F. M. Ahl.

216 Vergil Spring. 3 credits. Prerequisite: one term of 200-level Latin. M W F 11:15. Staff.
Selections from Vergil's Aeneid will be read with emphasis on Vergil's use of the epic tradition, his own poetic milieu, his poetic techniques, and his relation to the politics of his time.

241 Latin Composition Fall. 2 credits.

242 Latin Composition Spring. 2 credits.
Prerequisite: Classics 241 or equivalent. Not offered 1983–84. Staff.

312 Latin Undergraduate Seminar Fall or spring. 4 credits. Prerequisite: two terms of 200-level Latin or permission of instructor. Not offered 1983–84.

314 The Augustan Age Fall. 4 credits.


316 Roman Philosophical Writers Fall. 4 credits. Prerequisite: two terms of 200-level Latin. Not offered 1983–84. P. T. Mitsis.
Selected readings from Lucrèce's De Rerum Natura and Cicéron's De Finibus.

317 Roman Historiography Spring. 4 credits.
Prerequisite: one term of 300-level Latin or permission of the instructor. M W F 1:25; J. R. Ginsburg.
Readings from Sallust and Tacitus with particular attention to narrative technique.

318 Roman Elegy: Tibullus, Propertius, Ovid Fall. 4 credits. Prerequisite: two terms of 200-level Latin. M W F 11:15. Staff.

[366 Late Latin Spring. 4 credits. Prerequisite: permission of the instructor. Not offered 1983–84.]

368 Medieval Latin Literature Fall. 4 credits.
Prerequisite: Classics 214 or permission of instructor. T R 2:30–3:45. Staff.
Medieval Latin texts and their historical and cultural contexts are closely studied. Each term the course will concentrate on two or three topics, such as particular authors, genres, or periods.

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. M W F 2:30. Staff.

441 Advanced Latin Composition Spring. 2 credits. For undergraduates who have completed Latin 241–242 and for graduate students.

451–452 Independent Study in Latin, Undergraduate Level 451, fall; 452, spring. Up to 4 credits.
Hours to be arranged.

[460 The Latin Poems of Milton Fall. 4 credits. Prerequisite: two semesters of 300-level Latin. Not offered 1983–84.]

679 Seminar in Latin: Graduate Fall. 4 credits.
R 3–5. Staff.

Topic to be announced.

751–752 Independent Study for Graduate Students in Latin 751, fall; 752, spring. Up to 4 credits.
Hours to be arranged.

Classical Archaeology

[206 The Rise of Classical Greece Fall. 3 credits. Not offered 1983–84.]
Archaeology of the Greek dark ages. Topics include site reports, pottery, metalworking, the introduction of the alphabet, the beginnings of coinage, and links with Anatolia and the Near East.

220 Introduction to Art History: Art of the Classical World Fall. 3 credits. M W F 9:05. A. Ramage.
The sculpture, vase painting, and architecture of the ancient Greeks, from the Geometric period through the Hellenistic, and the art of the Romans from the early Republic to the late Empire.

[221 Minoan-Mycenaean Art and Archaeology (also History of Art 221) Fall. 3 credits. Not offered 1983–84.]
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 Levant, the effects of the volcanic eruptions of Thera (possibly Plato's Atlantis), and the evidence of Homer and the Greek myths.

232–233 Archaeology in Action I and II 232, fall; 233, spring. 3 credits each term. Prerequisites: Archaeology 100, Classics 220, or permission of the instructor. M W F 2:30–4:25; two labs to be arranged. P. I. Kuniholm.

[320 Arts and Monuments of Athens (also History of Art 320) Fall. 4 credits. Prerequisite: Classics 220 or permission of instructor. Not offered 1983–84.]

[321 Archaeology of Cyprus (also History of Art 321) Spring. 4 credits. Prerequisite: Classics 220 or permission of instructor. Not offered 1983–84.]
Study of Cyprus from its first settlement in the Neolithic period until the end of the ancient world. Special emphasis on the Bronze Age, the acme of Cypriot culture, and the neighboring civilizations. Lectures and oral reports by students. Students will have the opportunity to examine and study original unpublished material from the Cornell excavation at Alamba and study the collection.

[322 Greeks and Their Eastern Neighbors (also History of Art 328) Spring. 4 credits. Prerequisite: Classics 220, 221, or permission of the instructor. Not offered 1983–84. 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 third to the fourth centuries B.C.E. The course will focus on Greek relationships with Phoenicia and the rest of the Levant, Cyprus, Anatolia, and the Etruscans in the post-Bronze Age period.

323 Painting in the Greek and Roman World (also History of Art 323) Spring. 4 credits. M W F 2:30. A. Ramage.
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.

325 Greek Vase Painting (also History of Art 325) Fall. 4 credits. Not offered 1983–84.
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 1983–84.
A study of the formative period of Classical Greek civilization, based 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.
M W F 2:30. A. Ramage.
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 mints from the origins of coinage to the Late Roman period are studied. Lectures, student presentations, and work with actual examples.

329 Greek Sculpture (also History of Art 329) Fall. 4 credits. Not offered 1983–84.
Study of ancient Greek sculptural techniques and achievements in marble and bronze. Detailed examination of a selection of works to illustrate sculptural development.]
Society for the Humanities Seminars of Interest to Classics Students

Parents and Children in Athens and Jerusalem (Society for the Humanities 381-382) Fall; 381, fall; 382, spring. C. Kronfeld, B. Strauss.

Virgil's Elegiques: Images of Cultural Change (Society for the Humanities 413) Fall. A. Patterson.

The Myth of Orpheus (Society for the Humanities 415) Fall. F. Graf.


The Aristotelian Tradition in the Early and High Middle Ages (Society for the Humanities 417) Fall. J. Murdoch.

The Aristotelian Tradition in the Later Middle Ages (Society for the Humanities 418) Spring. J. Murdoch.

Thinking One's Way Back Into the Past (Society for the Humanities 423) Fall. F. Ahl.

Narcissus at the Well (Society for the Humanities 424) Spring. F. Ahl.

Comparative Literature

W. W. Holdheim, chairman (244 Goldwin Smith Hall, 256-4155), C. M. Carmichael (graduate faculty representative), W. Cohen (director of undergraduate studies), W. J. Kennedy, with J. Cutter (English), D. I. Grossvogel (Romance Studies), P. Hohenhali (German), E. Rosenberg (English).


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 offerings exemplify several current interdisciplinary approaches to literary study—for example, hermeneutics, rhetorical analysis, semiotics, deconstruction, Marxism, reception aesthetics, feminism, formalism, and psychoanalysis.

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 problems in literary theory (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 requirements. Full descriptions of Freshman Seminar Program offerings may be found on page 205.

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 F T 10. Staff. 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 antiquity to the Renaissance. 202: selections from the Renaissance to the present.

236 Greek Mythology (also Classics 236) Fall 3 credits. T R 8:40—9:55. G. Messing.

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.

[312 Comedy Not offered 1983—84. W. J. Kennedy.]


A study of ways in which communication between authors and audiences undergoes changes through
the influence of various media in texts from oral, literary, and advanced technological cultures. Readings include works by Plato, Dante, Swift, Nietzsche, Joyce, and Borges.

326 Christianity and Judaism  Spring. 4 credits. Not open to freshmen.

328 Literature of the Old Testament  Fall. 4 credits. Not open to freshmen.

342 Medieval Literature  Spring. 4 credits. M W F 12:20. R. E. Karle. Analysis and interpretation of great medieval literary works in translation. Though readings will vary somewhat from year to year, a typical program would be Beowulf, the Nibelungenlied, Njáls saga, a romance of Chretien, Wolfram's Parzival, Gottfried's Tristan and/or Sir Gawain and the Green Knight.

352 Classic and Renaissance Drama (also Theatre Arts 325)  Fall. 4 credits. M W F 9:05. A. Caputi. A study of the major traditions in Western drama from the beginnings among the Greeks through 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 will 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.

353 European Drama, 1660 to 1900 (also Theatre Arts 326)  Spring. 4 credits. M W F 2:30. R. Gross. Readings from major dramatists from Corneille to Chekhov, including such authors as Moliere, Congreve, Marivaux, Goldoni, Gozzi, Schiller, Kleist, Gogol, Ostrovsky and Ibsen.

354 Modern Drama (also Theatre Arts 327)  Fall. 4 credits.
 M W F 1:25. S. Williams. A study of the major currents of modern drama against the background of modern culture. Readings will include Ibsen, Strindberg, Chekhov, Shaw, Pirandello, O'Neill, Brecht, Beckett, Genet, and contemporary American and European playwrights.


388 Politics and the Novel (also Russian 388)  Fall. 4 credits. M W F 9:05. G. Gibran. From the French Revolution to the present. Literary representations of conflicts between political ideologies (idees de revolution, justice, nationalism) and private needs (art, nature, love, order). Marx, Flaubert, Dostoysvev, Conrad, Henry James, Trotsky, Lenin, V. S. Naipaul, Solzhenitsyn, Kundera. Some poetry will also be included: Yeats, Mayakovksy, Auden. Lectures and discussions.

392 Literature to Cinema, Cinema to Literature (also Italian 395)  Fall. 4 credits.
 T R 12:20–1:35. A. Grossvogel. A study of the ways literary language has influenced Italian cinema and the ways film language has had an impact on contemporary poetry and prose fiction. The films to be screened will be by Antonioni, Bertolucci, Bolognini, De Sica, Fellini, Pasolini, Soziali, Scavino, Visconti, Zeffirelli, and Zulini. The work of literature to be read in conjunction with these films will include selections from Boccaccio's Decameron and from the narrative works by Verga, Fogazzaro, D'Annunzio, Pirandello, Pavese, Prablini, Moravia, Bassani, Calvino, Buzatti, and Ledda.

393 Narrative and Ideology in Contemporary Italian Literature (also Italian 393)  Fall. 4 credits. T R 10:10–11:25. A. Grossvogel. The social, political, and economic frustrations of the south and the alienating effects of industrialization in the north as reflected in postwar Italian narrative. Works by Calvino, alessia, Pavese, Vittorino, Lev, Volti, Balestini, Gadda, and Moravia will be read. The course will be given either in English or Italian, according to demand. Most of the texts are available in translation.

398 French Film and Thought: The Unammed Eye (also French 399)  Fall. 4 credits.
 T R 2:30–3:45. D. Grossvogel. The importance of undetected sight in French thought and motion pictures: the privileging of a childlike eye, the child's world, the awareness of freedom. A phenomenological progression illustrated by such films as Louis lourdou's Zéro de conduite, le Sang d'un poete, L'Argent de poche, etc., and such authors as Breton, Camus, Cocteau, Robbe-Grillet, Sartre, etc.

400 The Japanese Noh Theatre and Modern Dramatists (also Asian Studies 400)  Fall. 4 credits.
 M W 2:30–3:45. K. Brazell. Several weeks will be spent studying the literary, performance, and aesthetic aspects of the Noh theatre. Emphasis will be on Noh as a performance system, a total theatre in which music, dance, text, costume, and props all interact to create the total effect. Then attention will turn to modern theatre people who have reacted to Noh in some creative way. Choice of dramatists will depend partly on student interests but will probably include Yeats, Brecht, Britten, Claudel, Grotowski, and Mishima. All readings may be done in English translation.

402 The Poetics of Modernism in Literature and Art: Paris, New York, Tel Aviv (also Near Eastern Studies 402)  Spring. 4 credits. Prerequisite: a 200-level or above course in one of the following: English or comparative literature, Hebrew or Yiddish, history of art or aesthetics.
 R 2:30–4:30. C. Kronfeld. The seminar will examine the development of the American modernist movement in literature and art and its influence on the emergence of modernism in Israel. The manifestos of the various movements will be analyzed against the poetic and artistic principles embedded in the works themselves. Special emphasis will be placed on expressionism and surrealism and on the methodological difficulties of discussing "isms" across media and cultures.

411 Studies in the Lyric: Dante, Sceve, Yeats  Spring. 4 credits.

419–420 Independent Study  419. fall; 420. spring. Variable credit. Comparative Literature 419 and 420 may be taken independently of each other. Hours to be arranged. Staff.


429 Readings in the New Testament  Fall. 4 credits. Limited to 25 students. M W F 1:25. J. P. Bishop. Close readings of representative texts from the New Testament in modern scholarly editions, with the help of appropriate commentary, introductory and specialized. The focus in 1983 will be on Acts and the letters of Paul. All readings will be in English, but repeated reference to the Greek original will be made. Graduate students and undergraduates from other colleges who are interested in the material should not feel inhibited from enrolling. The approach will be primarily exegetical; that is, we will try to find out what the texts say and what they mean by what they say. Thus we can hope to stay open to scholarly and religious issues alike.

561 A Dozen Moliere Plays and Some Lingering Dramatic Problems (also French 561)  Fall. 4 credits. M 12:30–2:45. D. Grossvogel. The course will examine such questions as the importance of the farce in the evolution of theater, the Italian influence in France, closed space, patronage and the comedy of manners, picaresque and related genres, and some key figures: on stage, limits of comedy, etc.

593 Narrative and Ideology in Contemporary Italian Literature (also Italian 593)  Fall. 4 credits. T R 10:10–11:25. A. Grossvogel. See Comparative Literature 393 for description.


619–620 Independent Study  619. fall; 620. spring. Variable credit. Comparative Literature 619 and 620 may be taken independently of each other. Hours to be arranged. Staff.

684 Heidegger: A Reading of Being and Time (also German Literature 684)  Spring. 4 credits. Prerequisite: permission of instructor.
 M 3:35–5:35. C. M. Arroyo. A reading of Being and Time that tries to reproduce the book's own logic (constructive criticism), to unveil the implicit but clear references to Marx, Husserl, Freud, etc. (instructive criticism), and to present the relevance of the book for a literary epistemology.

693 Marxism, Ideology, Literature (also English 693)  Fall. 4 credits. T R 10:10–11:25. W. Cohen and S. P. Mohanty. The seminar will address central problems of Marxist literary and cultural criticism, with emphasis on the methodological questions raised by political analysis. An inquiry into the presuppositions of various, interpretative strategies will lead us to the recent dialogues between Marxism and psychoanalysis, deconstruction, semiotics, and feminism. On this basis we will develop working definitions of a number of key terms: ideology, history, textuality, form, meaning, value, etc. Such considerations should, in turn, both illuminate and be illuminated by the reading of individual literary texts. The first half of the semester will consist of an overview, the second half will involve collaborative presentations by study groups formed to devote concentrated attention to specific themes or texts. Readings from such theorists as Althusser, Barthes, Eagleton, Gramsci, Jameson, Kristeva, Lukacs, Macherey, Sartre, Williams, and perhaps Foucault, Donzelot, and Deleuze and Guattari as well.
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 9 credits), and a concentration outside computer science (a minimum of 14 credits). The core focuses on the central topics within computer science: the logical design of programs; data structures, and algorithms. The remaining components of the major — the related electives and the outside concentration — provide a flexible extension to the core program. Students are expected to choose in consultation with their advisers the electives and the outside concentration that best suit their graduate and career plans.

Students interested in pursuing an advanced degree in theoretical computer science should concentrate in mathematics. Students preparing for advanced work in scientific computation should take Computer Science 621 (instead of Computer Science 321) 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 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 191–192–293–294;
2) programming and systems: Computer Science 101, 211, 314, or 410;
3) theory of computation: Computer Science 260, 481, and 482. (One of the following may be substituted for Computer Science 260: Machine Organization, Computer Science 321, or 432.)
4) numerical analysis: Computer Science 321.

Related Electives

The related electives requirement consists of three courses. One must be a computer science course numbered above 410; the other two are to be selected from the following:
Electrical engineering courses numbered 230 or higher.
Operations research courses numbered 260 or higher.
Mathematics courses numbered 381 or higher.
Computer Science courses numbered above 410.

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 ensure 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

Courses

For complete course descriptions, see the computer science listing in the College of Engineering.

100 Introduction to Computer Programming Fall, spring, or summer. 4 credits. Students who plan to take both Computer Science 101 and 100 must take 101 first.
2 lecs, 1 rec (optional). 3 evening exams.

100 Advanced Placement in Computing Fall. 2 credits plus 2 advanced placement credits. S-U grades only. To take this course, students enroll in Computer Science 100 or Engineering 105 for 2 credits.
2 lecs. 2 evening exams.

101 The Computer Age Fall, 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.

211 Computers and Programming Fall, spring, or summer. 3 credits. Prerequisite: Computer Science 100 or equivalent programming experience.
2 lecs, 1 rec. 2 evening exams.

280 Discrete Structures Fall or spring. 4 credits. Prerequisite: Computer Science 211 or permission of instructor. 3 lecs.
The Major

Students who wish to major in economics must have completed Economics 101 –102, (or approved equivalents) 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 or (with the adviser’s approval) 311 and 312; and (2) 20 credits of other economics courses listed by the Department of Economics, except that Economics 399 will not count toward the 20-credit requirement. With the permission of the major adviser, one or (in exceptional cases) two economics courses offered outside the College of Arts and Sciences may be applied to fulfill this requirement. Also with the major adviser’s permission, a statistics course offered by another department may be substituted for Economics 319.

An honors program will be offered in the 1983-84 academic year. Students should consult the director of undergraduate studies for more information. Students planning graduate work in economics or business are strongly encouraged to prepare themselves well in mathematics and econometrics.

Courses

101 Introductory Microeconomics Fall, spring, or summer. 3 credits. Economics 101 is not a prerequisite for 102.

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
Prequisite: Economics 101 and 102.

The course will review briefly the welfare properties of the perfectly competitive market model and then will consider a range of situations in which these properties are modified and where there may be a case for some form of government intervention. The cases to be considered will include (a) the presence of externalities, pollution, and the economics of the environment; (b) the provision of public goods, the free-rider problem; (c) uncertainty and imperfect information, an analysis in the context of labor and insurance markets, and the market for medical care; (d) the regulation of natural monopoly and public utility pricing; (e) the failure of the market to achieve desired redistribution and the redistribution of income. The course will consider the implications of these models of market failure in the context of economic policy and the role of government.

302 The Impact and Control of Technological Change (also Government 302 and City and Regional Planning 440) Spring. 4 credits. Not offered 1983–84.

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 relationships of a nation’s technological policy to the development of a national capital market, changing industrial structures, and the political process. Alternative political-economic solutions will be explored.

304 Economics and the Law Spring. 4 credits.
Prequisite: 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 constitutional law, corporation, tort, and procedure. No legal training is required.

305 Economics of Defense Spending Spring. 4 credits.
Prequisite: Economics 101 and 102.

Not offered 1983–84.

The economic aspects of defense spending are analyzed. Emphasis is on the procurement of weapons systems. Topics 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.

306 Introduction to Peace Science Fall. 4 credits.
Prequisite: 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.

307 Economic Analysis of Government (also Civil and Environmental Engineering 322) Spring. 4 credits. Prerequisite: one year of college-level mathematics plus Civil and Environmental Engineering 321 or Economics 311 or 313.

Government intervention in a market economy is analyzed. Public goods, public finance, cost-benefit analysis, environment regulation, and macroeconomic topics are covered.

309 Capitalism and Socialism (also Industrial and Labor Relations 347) Fall. 4 credits. Prerequisite: permission of instructor. Not offered 1983–84.

311 Intermediate Microeconomic Theory Fall, spring, or summer. 4 credits. Prerequisites: Economics 101–102 or permission of instructor.

The pricing processes in a private enterprise economy are analyzed under varying competitive conditions, and their role in the allocation of resources and the functional distribution of national income is considered.

312 Intermediate Macroeconomic Theory Fall, spring, or summer. 4 credits. Prerequisites: Economics 101–102 or permission of instructor.

The theory of national income determination and economic growth in alternative models of the national economy is introduced. The interaction and relation of aspects of these models of empirical aggregate economic analysis is examined.

313 Intermediate Microeconomic Theory Fall or spring. 4 credits. Prerequisites: Economics 101–102 and calculus.

See Economics 311 for course description.

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.
Prequisites: 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 to calculus and matrix algebra; problems of maximization of a function of several variables. Economic examples are used to illustrate and teach the mathematical concepts.

318 Intermediate Mathematical Economics II Spring. 4 credits.

Advanced techniques of optimization and application to economic theory.

319 Quantitative Methods Fall. 4 credits.
Prequisites: Economics 101–102 and calculus (Mathematics 111 or equivalent).

This course provides an introduction to statistical inference and to principles of probability. It includes descriptive statistics, principles of probability, discrete and continuous distributions, and testing (of sample means, proportions, variance). Regression analysis and correlation are introduced.

320 Quantitative Methods Spring. 4 credits. Prerequisites: Economics 101–102, 319, or approved equivalent, and calculus (Mathematics 111 or equivalent). Intermediate micro and macro theory are recommended but not required.

This course provides an introduction to the theory and application of econometric techniques. Students will learn how econometric models are formulated, estimated, used to test hypotheses, and used to forecast, will gain some ability in carrying out these operations, and will gain some facility in understanding economists’ results in studies using applied economics. The course covers the linear regression model and the multiple regression model (including dummy variables, autocorrelation, multicollinearity, heteroscedasticity, and distributed lag models), and it introduces simultaneous equation models.

323 American Economic History Fall. 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 Fall. 3 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 business organizations and entrepreneurs to those challenges.

326 History of American Enterprise Spring. 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 business organizations and entrepreneurs to those challenges.

329 Eastern Europe Today: Economics, Government, Culture (also Government 326 and Russian 328) Spring. 4 credits.
Prequisites: Economics majors cannot use this course to fulfill major requirements.

Introduction to interdisciplinary survey of Poland, Hungary, Czechoslovakia, and Yugoslavia since World War II. This course is open to students with some background in business organizations and entrepreneurs to those challenges.

330 The Soviet Union: Politics, Economics, and Culture (also Government 330 and Russian 330) Fall. 4 credits.

Economics majors cannot use this course to fulfill major requirements.

Introduction to interdisciplinary survey of the USSR since the Revolution, with emphasis on contemporary developments.
331 Money and Credit Fall 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: Resource Allocation and Fiscal Policy Fall 4 credits
Prerequisites: Economics 101–102.
The role of government in a free market economy is analyzed. Topics covered include the federal debt, taxes, the budget, and government regulation. 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.
This course covers a variety of topics in the economics of uncertainty, including basic decision theory, search theory, risk insurance, and equilibrium price dispersion.

341 Labor Economics Fall 4 credits

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. Not offered 1983–84.
The theory and empirical analysis of labor markets and their interaction with public policy issues are considered, with an emphasis on labor market disequilibrium attending serious efforts to accelerate economic development; and, the processes, institutional, and opportunities for innovation in transferring income from the relatively developed countries to those less developed.

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 comprises the economics 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; 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 311–312 or 312 or 314.
A study of the economics of direct regulation of industry. Concentration will be on the application of economic principles to common problems of regulation, with equal emphasis on institutional problems—the characteristics and problems of the regulatory process itself, the proper role and definition of competition—and recognition of the economic theory of reorganizing economic and noneconomic goals.

355 The Economics of the American System of Private Enterprise Fall 4 credits
Prerequisites: Economics 311–313 and 312 or 314 or equivalents.
A critical examination of the private sector of the United States economy, its history, some leading current issues involving it, and its relation to the theoretical and philosophical interpretations of the market economy.

356 Economics of the American System of Private Enterprise Spring 4 credits
Prerequisites: Economics 311–313 and 312 or 314 or equivalents.
For description see Economics 355.

357 Economics of Imperfect Information Fall 4 credits
Prerequisites: Economics 101–102 and calculus.
This course covers a variety of topics in the economics of uncertainty, including basic decision theory, search theory, risk insurance, and equilibrium price dispersion.

358 Current Economic Issues Fall 3 or 4 credits
Prerequisites: Economics 101–102. (A research paper will be required if the 4-credit option is chosen.) Not offered 1983–84.
The emphasis will be on the application of simple microeconomics and industrial organization concepts to the formulation of public policy in the present and recent past. Among the topics likely to be covered will be policies related to communications transportation, the financing and delivery of medical care, public utility, and other kinds of regulation; and the economics of inflation.

361 International Trade Theory and Policy Fall 4 credits
Prerequisites: Economics 101–102 or permission of instructor.
The course is designed to examine the trade-offs and to policy issues through an econometric research project.

362 International Monetary Theory and Policy Spring 4 credits
Prerequisites: Economics 101–102 or permission of instructor.
The principles that guided the formulation of international financial policies are surveyed. The evolution of the theory of balance of payments adjustment, international 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 1977. 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
Prerequisites: Economics 311–312 or permission of instructor.
Discussion of approaches to comparison of economic systems, with an emphasis on the role of abstract models (market economy, central planning, decentralized socialistic 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 Fall 4 credits
Prerequisites: Economics 101–102. Intended for students who are not majoring in economics. Special emphasis on Polish 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.).

369 International Specialization and Economic Development Fall 4 credits
Prerequisites: Economics 101–102 or permission of instructor.
Study of the process of sustaining accelerated economic growth in less-developed countries. Trade between growth, welfare, and equity; the history 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.

370 Applied Economic Development Fall 4 credits
Prerequisites: Economics 313 or 311 and calculus, and Economics 320.
Study of the problem of sustaining accelerated economic growth in less-developed countries. Trade between growth, welfare, and equity; the history 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.

371 Economic Development Fall 4 credits
Prerequisites: Economics 313 or 311 and calculus, and Economics 320.
Study of the problem of sustaining accelerated economic growth in less-developed countries. Trade between growth, welfare, and equity; the history 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 National and International Food Economics Spring 4 credits
Prerequisites: Economics 101–102 or permission of instructor.
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
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.
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. Examples will be drawn from the Yugoslav experience and, depending on student interest, the discussion will cover other foreign experiences such as Algeria, the Basque region, Chile, West Germany, Israel, Peru, and others. A considerable emphasis will be given to the new developments and new possibilities of implementing democratic, worker-coordinated, and workers-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 Fall. 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 systems might 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 313 or 311 and calculus. Not offered 1983–84. This course is intended for advanced economics majors who are specially interested in economic theory. Topics to be covered: (a) review of the one good Ramsey 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 roles of present value and internal rate of return in guiding investment decisions; (c) growth, exhaustible resources, pollution, and conservation: discussion of the trade-offs facing a society.

445 Topics in Microeconomic Analysis—Markets and Planning Fall. 4 credits. Prerequisites: Economics 313 or 311 and one term of calculus. This is a course of economic theory designed for upperclass undergraduates. 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 conducted efficiently? etc. 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 of modern economic analysis—how to define concepts unambiguously, how to form propositions in clear-cut fashion, and how to follow up logical implications subsequently to the conclusion.

466 Topics in Macroeconomic Analysis—Is Keynesianism Dead? Spring. 4 credits. Prerequisites: Economics 314 or 312 and one term of calculus. The coverage of this course may vary from term to term. Presently the content of the course deals with the range of criticisms against Keynesian theory by the New Classical Economics, alias the Equilibrium School, alias the Rational Expectations School. Despite the fact that almost all intermediate macroeconomics textbooks are Keynesian in perspective, clearly Keynesian economics is currently at bay. We shall review critically critiques to Keynesian theory.

481 Economic Effects of Participation and Labor-Management Systems Spring. 4 credits. Prerequisites: Economics 313 or 311 and calculus, Economics 320 and 381. 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. Numerous empirical studies are examined with particular emphasis on their ability to test the relevant institutions and test the resulting theoretical predictions with appropriate econometric methods.

482 Practical Aspects of Business Management of Worker Enterprises Spring. 4 credits. Prerequisites: Economics 311 or 313 and 312 or 314. May be taken concurrently with or following Economics 362/562. This course is designed to further and deepen undergraduate and graduate students’ knowledge of workers’ self-management and cooperation, especially in view of actual formation of democratic enterprises. It will be based primarily on Freirean dialogue and participants’ own presentations of their research in relevant areas such as cooperative business law, finance, accounting, or internal work organization. The instructor will act primarily as a coordinator and resource person, together with occasional invited speakers practically involved in the area of workers’ management and cooperation. Students who have taken all three courses, Economics 382/582, 482, and 483, both graduate and undergraduate, are welcome to participate as teacher-student interns. They may receive additional independent study credits for this work.

483 The Technological and Product Base of Worker Enterprises, with Special Emphasis on Ecological 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 on the other, while also engaging in actual learning about, and production of, solar-energy-based new technologies and products. Each student will be able to construct his or her own solar water pump using the Vanek patents pending and work on several other related concrete projects. The students will also be invited to form worker cooperatives based on the experiences and results of Economics 382/582, 482, and 483.

Graduate Courses and Seminars

503 Nonparametric Methods for Peace Scientists and Regional Scientists Fall. 4 credits. Prerequisites: Economics 313 or 312 and one term of calculus. 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 Spring. 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 strategic 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, externalities and public goods, intertemporal choice, simple dynamic models and resource depletion, choice under uncertainty.

513 Macroeconomic Theory: Static Income Determination Fall. 4 credits.

514 Macroeconomic Theory: Dynamic Models, Growth, and Inflation Spring. 4 credits.

517 Intermediate Mathematical Economics I Fall. 4 credits.

518 Intermediate Mathematical Economics II Spring. 4 credits.

519 Quantitative Methods Spring. 4 credits.

520 Quantitative Methods Fall. 4 credits. Prerequisites: good control of microeconomic and macroeconomic theory and some knowledge of calculus, 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.

524 American Economic History Spring. 4 credits. For description see Economics 324.

525 Economic History of Latin America Fall. 4 credits. For description see Economics 325.

535 Public Finance: Resource Allocation and Fiscal Policy Fall. 4 credits. For description see Economics 335.

536 Public Finance: Resource Allocation and Fiscal Policy Spring. 4 credits. For description see Economics 336.

551 Industrial Organization Fall. 4 credits. For description see Economics 351.

552 Public Regulation of Business Spring. 4 credits. For description see Economics 352.

555 Economics of the American System of Private Enterprise Fall. 4 credits. For description see Economics 355.

556 Economics of the American System of Private Enterprise Spring. 4 credits. For description see Economics 356.

557 Economics of Imperfect Information Fall. 4 credits. Prerequisites: Economics 509 and statistics.
The purpose of the course is to consider some major topics in the microeconomics of uncertainty. Although the precise topics considered will vary from year to year, subjects such as markets with asymmetric information, signaling theory, sequential choice theory, and search theory will be discussed.

561 International Trade Theory and Policy  Fall 4 credits.
For description see Economics 361.

562 International Monetary Theory and Policy  Spring 4 credits.
For description see Economics 361.

563 Comparative Economic Systems: Soviet Union and Europe  Fall 4 credits.
For description see Economics 367.

564 Advanced Microeconomic Theory  Fall 4 credits.

565 Economic Problems of Latin America  Spring 4 credits.


568 Economics of Participation and Self-Management  Fall 4 credits.
Not offered 1983–84.

569 Readings in Economics  Fall or spring.
Variable credit. Independent study.

603 Seminar in Peace Science  Fall 4 credits.
Among topics to be covered at an advanced level are game theory, coalition theory, bargaining and negotiation processes, cooperative procedures, microbehavior models, macrosocial processes, and general systems analysis.

604 Advanced Social Theory for Peace Scientists  Spring 4 credits.
Prerequisites: Economics 505 and knowledge of microeconomic theory.
Study of diverse social science hypotheses and theories as they relate to, and can be synthesized within, multinational, multinational, and generally multigroup conflict and cooperative frameworks. Particular attention will be given to developments stemming from microeconomics and general systems theory. Dynamic analyses will be emphasized.

Prerequisites: Economics 509, 510, 513, 514, 519, and 520.

The Department of English offers a wide range of courses in English and American literature as well as in creative writing and expository prose. Literature courses focus variously on close reading of texts, on study of particular authors and genres, on the relationship of literary works to their historical periods, and on questions of critical theory and method. The department not only stresses the development of
Courses for Nonmajors
For students not majoring in English, the department makes available a variety of courses at all levels. Some courses in the 200 level are open to qualified freshmen, and all of them are open to sophomores. Courses at the 300 level are open to juniors and seniors, and to underclass students with permission of the instructor. The suitability of courses at the 400 and 500 levels for nonmajors will vary from topic to topic, and permission of the instructor is required.

Courses for Freshmen
As part of the Freshman Seminar Program, the Department of English offers many one-semester courses concerned with various forms of writing (narrative, biographical, expository), with the study of specific areas in English and American literature, and with the relation of literature to culture. Students may elect any two of these courses during their first year to satisfy the Freshman Seminar requirement. Descriptions of Freshman Seminar offerings may be found on pages 205–206.

Courses for Sophomores
Although courses numbered in the 200s are primarily for sophomores, some of them are open to qualified freshmen and to qualified seniors. Courses approved for the major are English 201 and 202 and all courses numbered 300 or above except English 496. In addition to English 201–202, students may count up to two 200-level courses toward the major from “Courses Approved for the Major,” listed below.

201–202 The English Literary Tradition
Fall; 202, spring; 4 credits each term. Open to all undergraduates. English 201 is not a prerequisite to 202. May be counted toward the English major.

205–206 Readings in English and American Literature
Fall, 205; fall, 206; spring, 3 credits each term. Open to all undergraduates. English 205 is not a prerequisite to 206. M W F 10:10. Fall: R. T. Farrell. Spring: S. M. Parnash.

208: Covers literature since the mid-nineteenth century. Novels by such authors as Emily Bronte, T. H. H. Hardy, Hardy, Hemingway, and Faulkner, perhaps a play by Shaw or Pinter; and poems by Yeats, Auden, Frost, or others. Two lectures and a short discussion section each week. One short paper, a prelim, and a final examination.

219 Myth and Heroic Legend

219 Myth and Heroic Legend

227 Shakespeare
Fall or spring, 3 credits. Each section limited to 25 students.

288–289 Expository Writing
Fall, 288, spring, 289, 3 credits each term. Each section limited to 18 students.

298–300 English 201–206
Fall, 298, spring, 3 credits each term. Each section limited to 25 students.

200-Level Courses Approved for the Major
Students may take up to two of the following courses for credit toward the English major.

207 Twentieth-Century Biography
Spring, 4 credits. M W F 11:15.

247 Major Nineteenth-Century Women Novelists
Fall. 4 credits. M W 1:25. J. F. Blackall.

Honors
Prospective candidates for the degree of Bachelor of Arts with honors in English should consult the chairperson of the Honors Committee during the spring term of their sophomore year or early in their junior year. Honors candidates will take one or two honors seminars (English 491 or 492) during their junior year, as well as a 400-level course in the field in which they plan to work during their senior year. The work of the senior year is a year-long tutorial (English 493 or 494) of the candidates’ choosing, culminating in the writing of a scholarly honors thesis of approximately fifty pages, or a book-length work of high quality in creative writing completed for English 480–481. More information about the program may be found in the department’s brochure for honors candidates.
An interdisciplinary survey of Irish culture from the 1840s to the Revolution and Civil War of 1916-23 will focus on the Young Ireland movement of Students will also collect and analyze original folk and myths together with Faulkner's studied in relation to historical and political Yeats. Synge, Joyce, O'Casey, and others will be 277 Folklore and Literature Joyce, Kafka, Woolf, and Thomas Mann, as well as found in American and British literature that have made extensive use of folk sources For example, we will read the classic ballads together with ballads 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.

Courses that Satisfy the Major Prerequisite

270 The Reading of Fiction 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. M.W.F 11:15 or 1:25, or T.R 2:30–3:45. Selected masterworks by such playwrights as Sophocles, Ibsen, and Shaw introduce the chief idioms and styles of Western dramatic tradition. The course will be taught in sections.

275 The American Literary Tradition Fall or spring. 3 credits. Recommended for prospective majors in American studies. Fall: T.R 12:30–1:35, D. Fried. Spring: M.W.F 9:05, M.J. Colacurcio. The problem of an American national literature is explored through the reading and discussions 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 with which critical appreciation must engage. Works by such writers as Franklin, Hawthorne, Dickinson, Melville, Twain, Wharton, James, Stein, and Hemingway.


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. M.W.F 12:20. E.R. Kaske. Readings from Middle English literature in translation, excluding Chaucer. Though texts vary, a typical selection could be Arthurian romances such as Lagomann's Brut, Alliterative Morte Arthure, Sir Gawain and the Green Knight, and Malory's Morte d'Arthur; Middle English lyrics and plays; and major poems such as Piers Plowman, The Pearl, the other works of the Gawain-poet, Gower's Confessio Amantis, The Owl and the Nightingale, and The Land of Cockayne.

318 Saga as Historical Novel: An Introduction to Saga Literature Fall. 4 credits. M.W.F 11:15. J. Harris. A survey of saga literature concentrating upon the growth of the form, and upon the works of the earliest to the present—Bellow, Chekhov, Conrad, Faulkner, Joyce, Mann, Kafka, and others.

322 The Seventeenth Century Spring. 4 credits. M.W.F 10:10. D. Novarr. The main traditions in poetry—Metaphysical, neoclassic, and the Spenserian inheritance—will be explored with emphasis on John Donne, Ben Jonson, Andrew Marvell, and on the genres they utilized: lyric, love elegy, formal satire, epistolam, verse epistle, ode, hymn, death elegy, mock-epic. Also, consideration of the major works by Burton, Browne, Walton, and Bunyan, and of the King James Version of the Bible; prose style; popular prose forms: essay, character, letter, biography.

330 Restoration and Eighteenth-Century Literature Spring. 4 credits. M.W.F 11:25. F. Bogel. The rise of the novel in eighteenth-century England. Why did the novel become a dominant literary genre in this period? What can these works tell us about the nature of fiction or about their historical moment and our own? Novels by Defoe, Fielding, Richardson, Sterne, Radcliffe, Burney, and Austen.

340 The Romantic Poets Spring. 4 credits. M.W.F 11:15. S.M. Parrish. A close reading of the poems of Blake, Coleridge, Wordsworth, Byron, Shelley, and Keats, together with some of their letters and journals. Forms of modern fiction, with emphasis on the short story and novels. Critical study of works by English, American, and Continental writers from 1880 to the present—Bellow, Chekhov, Conrad, Faulkner, Joyce, Mann, Kafka, and others.

348 The Female Literary Tradition: Wollstonecraft to Woolf (also Woman's Studies 348) Spring. 4 credits. M.W.F 12:20. M. Jacobs. 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 representation in 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) unaccany, 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 the beginnings of twentieth-century modernist experiment by women. Texts will include works by Wollstonecraft, Austen, Mary Shelley, Emily and Charlotte Bronte, Eliot, Barrett Browning, Gaskell, Gilman, Scheiner, and Woolf.

350 The Early Twentieth Century (to 1914) Fall. 4 credits. M.W.F 10:10. D.R. 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, the course will attempt to provide to 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, their 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.

351 Modern Literature since 1914 Spring. 4 credits. M.W.F 10:10. J. Stellworthy. A survey of modern English, Anglo-Irish, and Anglo-Welsh fiction, poetry, and drama by Shaw, Lawrence, Joyce, Forster, Woolf, Waugh, Yeats, Eliot, O'Casey, Auden, Beckett, Pinter, and others. Although the emphasis in lectures and discussions will be upon individual works, the wider context of literary, intellectual, and social history will also be considered.
Complementing the texts, film versions of certain novels will be shown, and there will be some taped recordings of the poets.

Major English Authors

319 Chaucer  Spring 4 credits.
M W F 11:15  R. T. Farell
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.

327 Shakespeare  Fall 4 credits.
M W F 9:05  B. B. Adams
An introduction to the works of Shakespeare, based on a selection of plays representative of the stages of his artistic development and the range of his achievement.

329 Milton  Spring 4 credits.
M W F 9:05  G. Teskey
An introduction to the poetry of John Milton.

Major Periods of American Literature

361 Early American Literature  Fall 4 credits.
M W F 10:10  M. J. Colacurcio
The literature of ideas produced by America’s Puritan and Enlightenment writers: Bradford, Taylor, Edwards, and Franklin. The first achievements of the national literature: Irving, Cooper, Poe, and Hawthorne.

362 The American Renaissance  Spring 4 credits. Recommended but not required: English 361.
M W F 1:25  M. J. Colacurcio
America’s literary maturity at midcentury: the individual masterpieces and the interrelated careers of Emerson, Thoreau, Hawthorne, Melville, Whitman, and Dickinson.

363 The Age of Realism and Naturalism  Fall 4 credits.
T R 10:10  M. Seltzer
The literary expression of new attitudes toward American society and culture between the Civil War and the early years of the twentieth century. We will read representative works by writers such as Mark Twain, W. D. Howells, Henry James, Edith Wharton, Stephen Crane, Kate Chopin, and Theodore Dreiser.

364 American Literature in the Twentieth Century  Spring 4 credits.
M W F 10:10  C. Strout
A study of important writers from the time of the first World War to the end of the second who deal with characteristically modern problems, whether as innovators or traditionalists. The main focus will be on the novel, but memoirs and essays will be included. Such writers as Adams, Catton, Lewis, Hemingway, Fitzgerald, Dos Passos, Steichen, Cozzens, Wright, McCarthy, Faulkner, and Bellow will be considered.

365 American Literature since 1945  4 credits. Not offered 1983–84]

Genres and Special Topics

M W F 11:15  D. McCall
A survey of major American novels of the nineteenth century. Writers Studied include Nathaniel Hawthorne, Herman Melville, Mark Twain, and Henry James.

367 The Modern American Novel between the Wars  4 credits. Not offered 1983–84 ]

368 The Contemporary American Novel  Fall 4 credits.
M W F 1 25. M. Hite
A reading of some major American novels written after 1945. Works by Bellow, Hawkes, Pynchon, Morrison, Barth, and others.

370 The Nineteenth-Century English Novel  Spring 4 credits.
M W F 12:20  R. Sawyer

372 English Drama (also Theatre Arts 372)  Spring 4 credits.
M W F 10:15  S. McMillin
Important events in the English theatre from the beginning to the twentieth century. Plays by Marlowe, Shakespeare, Jonson, Webster, Wycherly, Dryden, Behn, Congreve, Sheridan, Shelley, Shaw, and others. Relationships between play houses, dramatic texts, and politics.

Creative and Expository Writing

382–383 Narrative Writing  382 fall, 383, spring. 4 credits each term. Each section limited to 15 students. Prerequisites: English 280–281 or permission of instructor.
M W F 1:25 or 2:30. T or T R 2:30, plus conferences to be arranged. Instructors to be announced. The writing of fiction; 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. Prerequisites: English 280 and 281 and permission of instructor.
The writing of poetry; study of models; analysis of students’ poems; personal conferences.


388–389 The Art of the Essay  388 fall; 389, spring. Limited to 15 students. Prerequisites: permission of the instructor. Interested students should submit a writing sample to the appropriate professor before the beginning of the term.
Fall: M W F 1:25 and conferences to be arranged. W. Statoff. Spring: M W 2:30 and conferences to be arranged. C. Levy.
For both English majors and nonmajors who have done well in such courses as Freshman Seminars or English 288–289 and who desire intensive practice in writing expository and personal essays; particular, but not exclusive, emphasis on expository techniques of analysis and persuasion.

Courses for Advanced Undergraduates

Enrollment in courses at the 400 level is limited by prerequisite or permission of the instructor.

403 Poetry and Crisis: Four Poets and Four Problems  Fall 4 credits.
M W F 2:30  R. Kirschten
We will spend three weeks on each of four poets, whose work will be paired with a representative critical problem. The poets and problems are James Dickey and ritual violence, John Berryman and self-destruction, A. R. Ammons and self-unity, and Marianne Moore and retroactive confusion.

409 Freud as Imaginative Writer and Reader (also Comparative Literature 411)  4 credits. Not offered 1983–84.]

411 Introduction to Old English (also English 611)  Fall 4 credits.
Hours to be arranged. T. D. Hill
The aim of the course is to teach students to read Old English as accurately and fluently as possible. While the primary emphasis is upon acquiring a reading knowledge of the language, we will also be concerned with the linguistic and literary problems presented by the texts we cover.

413 The English Language  Spring 4 credits.
M W F 1:25  B. B. Adams
A basic survey of the historical development of English from the Anglo-Saxon period to the present, with special reference to the needs and interests of students of literature.

417 Studies in Chaucerian Poetics  Fall 4 credits.
T R 2:30  L. Patterson
Explorations of problems of narrative form, authorial intention, historical context, and literary authority in the House of Fame, Troilus and Criseyde, and selected Canterbury Tales. The course will place a special emphasis upon the relationship between current theoretical interests (deconstruction, feminism, hermeneutics, and “new” historicism) and medieval literature.

427 Studies in Shakespeare  Fall and spring 4 credits each term.
Fall: Courtesy, Romance, and Shakespearean History  M W F 10:10  C. Levy
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 Castiglione’s Book of the Courtier, Eliot’s The Governour, A Mirror for Magistrates, and Sidney’s The Countess of Pembroke’s Arcadia. Among topics to be explored are growth, responsibility, play, order, and community.

Spring: The Major Tragedies  M W F 9:05  A. Caputi
This course will highlight a close reading of Hamlet, Macbeth, King Lear, and Antony and Cleopatra against a background of the pertinent traditions in tragedy. The work will feature both lectures and discussions and will include some attention to textual problems, sources, and critical opinion.


441 Romantic Fictions, Romantic Selves  Fall 4 credits.
M W F 1:25  M. Jacobus
What are the fictions by which Romantic poets and novelists represent themselves and their relation to writing? What means do they use to articulate coherent (or divided) selves? How are these fictional selves sustained, fragmented, or undone? We will explore the ways in which such fictions intersect with the central Romantic concerns of language, politics, and the imagination, looking particularly at the dimensions of irony, theatricality, and time as they delineate or construct the self of the Romantic writer. Works will include Wordsworth’s Prelude, Keats’s The Fall of Innocence, Byron’s Childe Harold, and Shelley’s Prometheus Unbound, along with novels by Godwin, Mary Shelley, and Hogg (Caleb Williams, Frankenstein, and The Confessions of a Justified Sinner, respectively) and De Quincey’s autobiographical Confessions of an Opium Eater.

442 Romantic Movement in Poetry, Painting, and Graphic Arts (also History of Art 459)  Fall 4 credits.
T 2:30–4:30  J. Viscomi
In this course we will examine the works of English Romantic poets and artists whose experiments with media have significantly changed our understanding of art. Works include the art and literature of the Picturesque, watercolor paintings by Sandby, Cozens, and Turner; prints by Blake, Gainsborough, and Rowlandson; and lyrical poetry of Wordsworth,
An introduction to the history of ideas in the nineteenth century and to some key literary texts. To a large extent the "modernity" of modern thought derives from changes that occurred in Victorian England, particularly from revolutions in thinking about nature, religion, and society. We will begin with two Romantics, Wordsworth and Coleridge, and move to the radical critique of industrial society by writers like Carlyle, Dickens, and Marx, then to changing concepts of science and human spirituality in Tennyson, Ruskin, and Darwin. We will conclude with exploration of how the avant-garde related to the concerns of contemporary political theatre, ethnic theatre, feminist theatre. The course will also consider the world of performance art and theory. Readings will include texts by Shepard, Raitt, Marat, Guare, Baraka, Miller, Ward, Wilson, Anderson, Durang. Ideally, we can also arrange a study weekend to see theatre in New York City.

Edith Wharton, Willa Cather, and Eudora Welty (also Women's Studies 456)


The American South in the South American Novel: A Close Study and Comparison of the Fiction of William Faulkner and Gabriel Garcia Marquez

M W F 3:35. L. Herrin. We will read and discuss at least four books apiece by these (in Faulkner’s words) “sole progenitors” of fictional worlds: certainly Faulkner’s The Sound and the Fury and Absalom, Absalom! and Garcia’s One Hundred Years of Solitude and Autumn of the Patriarch will be among them. We will discover what we can about them, but I am very much interested in the nature of Faulkner’s influence on Garcia’s work and perhaps, by extension, in what the American South and South America have fictionally in common. You will be expected to read, write interpretive papers, and talk.

Masterworks of Modernism

Fall. 4 credits. M W F 1:15. P. L. Mara. Students will read major texts from the period between the world wars. An exploration of the search for values in a troubled era and of concomitant formal experiments. The syllabus will include Lawrence, Women in Love; Pound, Cantos; Eliot, The Waste Land, Four Quartets, Woolf, Mrs. Dalloway, To the Lighthouse; and Yeats, The Tower, Last Poems.

The Political Novel in America

Fall. 4 credits. M W 2:30. C. Stout. 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, Chesnutt, Steinbeck, Dos Passos, Hemingway, Wright, Ellison, Cozzens, and Vidal (among others) will be included. Previous work in American literature, history, or government recommended.

American History and Literary Imagination

Spring. 4 credits. M W 2:30. S. C. Stout. 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, Heiner Kipphardt, William Styron, Robert Penn Warren, and E. L. Doctorow.

What are the aesthetics, aims, and social attitudes of the avant-garde? How does the avant-garde differ from more traditional American drama? How are the claims of the avant-garde related to the concerns of contemporary political theatre, ethnic theatre, feminist theatre? The course will also consider the world of performance art and theory. Readings will include texts by Shepard, Raitt, Mabutty, The Cantos, Eliot, The Waste Land, Four Quartets, Woolf, Mrs. Dalloway, To the Lighthouse, and Yeats, The Tower, Last Poems.

A critical study of major fiction of Conrad, Lawrence, and Joyce. Readings will focus on Conrad and Joyce but will include one major novel by Lawrence. The last third of the term will be spent on the topic of the individual artist. 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.

Poetry of the Fifties, Sixties, and Seventies


This seminar will include reading some of the major poets of the last three decades with the aim of studying their formal and thematic tendencies and exploring the influences that have shaped them, while still focusing on the individual artists. Poets whose work we will examine include W. C. Williams, Alan Ginsberg, Robert Lowell, Marianne Moore, Elizabeth Bishop, Sylvia Plath, A. R. Ammons, and John Ashbery.

Poetry in the Novel

Fall. 4 credits. M W 12:15. T. Slatoff.

Study and discussion of novels by Faulkner and Patrick White. White, a Nobel Prize winner, is an Australian writer whom many are coming to recognize as one of the major voices of this century. The first purpose of the course is to introduce more readers to White. Another is to view the two voices and visions in relation to one another.

The American South in the South American Novel

Fall. 4 credits. M W 1:15. D. Mermin. A critical survey of the major fiction of Conrad, Lawrence, and Joyce. Readings will focus on Conrad and Joyce but will include one major novel by Lawrence. The last third of the term will be spent on the topic of the individual artist. 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.

Poets for Poets and Critics


Intended for those writers who have already gained a strong working knowledge of criticism 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.

Poetry for Poets and Critics


This is a class for upperclass students—preferably seniors—who want more practice writing and who are curious about why people write about literature in the variety of ways they do. Short exercises will be assigned each week and commented upon, but the discussion will focus on the institutional contexts in which writing about literature is produced and...
consumed and on the relations among various kinds of discourse—classroom talk, literary criticism, literary scholarship, literary theory, of cetera.

491 Honors Seminar I: Four Novelist Fall. 4 credits. T. R. 2:30-3:45. E. Rosenberg. The four novelists are Dickens, Hardy, Gide, and Mann, and the texts I propose to examine are Oliver Twist, and either Bleak House or Little Dorrit, Mayor of Casterbridge and Jude the Obscure. The Immoralist, Straight Is the Gate, and Pastoral Symphony. Dr. Faustus and Felix Krull.

492 Honors Seminar II: The Art of Narrative in the English Renaissance Spring. 4 credits. M. W. F. 11:15. G. Tsekey. A study of the restless variety of ways in which stories were told in England in the sixteenth and seventeenth centuries, before the emergence of the novel as the dominant narrative form. Some of the forms to be examined are Ovidian verse-narrative, prose romance, picaresque adventure, ballad, biography, historical narrative, and allegory. Major figures to appear are Spenser, Sidney, Marlowe, Chapman, Nashe, and Shakespeare (Cymbeline). While each work is to be examined critically, larger theoretical questions about narrative will provide a unifying framework for discussion.

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 committee. Staff.

495 Independent Study Fall or spring. 2-4 credits. After consulting their major adviser, 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 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

Permission of the instructor is a prerequisite for admission to courses numbered in the 600s. These are primarily intended for graduate students, although qualified undergraduates are not excluded. Undergraduates seeking admission to a 600-level course should consult the appropriate instructor. The list of courses given below is illustrative only; a definitive list, together with course descriptions and class meeting times, will be published in a separate department brochure before course enrollment each term.

602 Advanced Old Norse: Poetry and Poetics (also German 611) Fall. 4 credits. J. Harris.

611 Introduction to Old English (also English 411) Fall. 4 credits. T. D. Hill.

612 Beowulf Spring. 4 credits. J. Harris.

613 Middle English Literature Fall. 4 credits. R. E. Kaske.

619 Chaucer Spring. 4 credits. R. E. Kaske.

621 Spenser Spring. 4 credits. C. V. Kaske.

627 Shakespeare: The Tragedies Fall. 4 credits. E. G. Fogel.

628 Elizabethan and Jacobean Drama Spring. 4 credits. H. S. McMillan.

632 The Later Eighteenth Century Fall. 4 credits. F. Bogel.

641 Romantic Autobiography Fall. 4 credits. M. Jacobus.

642 Studies in Romantic Drama Spring. 4 credits. R. Parker.

646 Victorian Prose Fall. 4 credits. P. Sawyer.

647 Thackery and James Spring. 4 credits. J. F. Blackall.

648 Dickens and His Circle Fall. 4 credits. E. Rosenberg.

653 Emergence of Modernism Spring. 4 credits. S. Siegel.

664 Frost, Eliot, Stevens Fall. 4 credits. R. Morgan.

666 Literary Naturalism Fall. 4 credits. M. Seltzer.

667 Autobiography in America Spring. 4 credits. D. McCall.

670 Evolution of the Novel I Spring. 4 credits. H. Shaw.

672 Theory of the Novel Fall. 4 credits. D. R. Schwarz.

673 Forms of Poetry Spring. 4 credits. D. Fried.

674 Feminist Literary Theory and Psychoanalysis Spring. 4 credits. M. Jacobs.

678 Philosophy and Theory of Tragedy Fall. 4 credits. T. C. Murray.

693 Marxism and Literature (also Comparative Literature 693) Fall. 4 credits. S. P. Monamy.

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.

701 Introduction to Research and Scholarly Methods Fall. 2 credits. S. M. Parrish.

702 Claims of Theory Spring. 2 credits. M. Seltzer.

723 John Donne Fall. 5 credits. D. Novarr.

742 Wordsworth Spring. 5 credits. S. M. Parrish.

752 Conrad Spring. 5 credits. D. R. Schwarz.

753 Yeats Fall. 5 credits. J. Stallworthy.

763 Hawthorne Fall. 5 credits. M. J. Colicicurc.

764 Faulkner Spring. 5 credits. W. J. Stallway.

781.1 M.F.A. Seminar: Prose Fall. 5 credits. A. Lune.

781.2 M.F.A. Seminar: Poetry Fall. 5 credits. K. A. McClane.

781.3 M.F.A. Seminar: Prose Spring. 5 credits. W. J. Stalliow.

781.2 M.F.A. Seminar: Poetry Spring. 5 credits. R. Morgan.

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)

Rhetoric and Technology (Comparative Literature 315)

The European Novel (Comparative Literature 363-364)

Studies in the Lyric: Dante, Sceve, and Yeats (Comparative Literature 411/611)

Gadamer's Hermeneutics (Comparative Literature 698)

The Hermeneutic Tradition (Comparative Literature 699)

Society for the Humanities

Virgil's Eclogues: Images of Cultural Change (Society for the Humanities 413)

The Aristotelian Tradition in the Early and High Middle Ages (Society for the Humanities 417)

The Aristotelian Tradition in the Later Middle Ages (Society for the Humanities 418)

The Rhetoric of Renaissance Humanism (Society for the Humanities 412-422)

French

See Modern Languages, Literatures, and Linguistics, pp. 153 and 164.
Geological Sciences


As an intercollege unit, the Department of Geological Sciences has degree programs in both the College of Arts and Sciences and the College of Engineering. Within the past few years, studies of the earth have become increasingly important. The need for increased understanding of geodynamics, limited energy and mineral reserves, awareness of natural hazards such as earthquakes and volcanic eruptions, and an increasing concern for our environment encourage studies of the earth by geologists. Consequently, interest in geology courses and the employment of geologists have greatly increased.

There are fifteen faculty members, including Cornell's president, in the department, and forty to 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, Scotland, 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, geography 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 of the two-semester sequences of courses chosen from the following, or their equivalents: Biology Sciences 101–103 and 102–104, Chemistry 207–208, Mathematics 191–192, and Physics 112–213. Geological Sciences 101–102 is recommended, but a student with a strong foundation in mathematics and science may be accepted as a major without completion of 101–102.

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 above, 3 credits. Prospective majors should consult one of the following departmental major advisers: W. A. Bassett, 222 Kimball Hall; W. B. Travers, 219 Kimball Hall; J. Oliver, 209 Kimball Hall; A. L. Bloom, 211 Kimball Hall; or A. K. Gibbs, 224 Kimball Hall, as early as possible for advice in planning a program. Students majoring in geological sciences may attend the departmental seminars and take advantage of cruises, field trips, and conferences offered through the Department of Geological Sciences.

Courses offered at the 100 and 200 level are open to all students. Certain 300-level courses in geology may be of particular interest to students of chemistry, biology, ecology, and physics. Students are encouraged to inquire about courses that interest them at the department office, 210 Kimball Hall.

Honors. An honors program is offered by the Department of Geological Sciences for superior students. Candidates for honors must maintain an overall 3.0 grade-point average and a cumulative average of 3.5 in the major and complete a senior thesis (Geological Sciences 430). Students interested in applying should contact their advisers during the second semester of the junior year.

Courses

For course descriptions see the Geological Sciences listing in the College of Engineering.

German Literature

P. Hohendahl, chairman, H. Deinert, director of undergraduate studies; E. A. Blackall, I. Ezergailis, S. L. Gilman, A. Groos, J. C. Harris, C. A. Martin, P. W. Nutting.

The Department of German Literature offers courses in German, medieval German, Yiddish, and Old Icelandic literatures. These courses reflect the heterogeneous character 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 seventeenth century. Students are expected to have adequate background in German and Latin, which is emphasized in the courses listed above. Honors.

The descriptions of Government 494 and 495, given on p. 136, 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 in the same year that they take Government 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.

111 The Government of the United States Spring: 3 credits; T. J. Low.

An introduction to government through the American experience. Concentration on the role of the president in the execution of federal power. The political parties, the role of interest groups, the role of political institutions. Government 133.

131 Introduction to Comparative Government and Politics Spring: 3 credits; N. T. Uphoff.

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 role of political conflict, and the adaptation of political systems to changing conditions.

161 Introduction to Political Theory Fall: 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. N. Lebow. An introduction to the basic concepts and practice of international politics.

Freshman Seminars

100 Freshman Seminars Fall or spring. 3 credits. Seminars will be offered in both the fall and spring terms. Consult pp. 206–207, the supplement issued by the department, and the Freshman Seminar booklet for course descriptions and instructors.

Major Seminars

300 Major Seminars Fall or spring. 4 credits. Consult the supplement issued by the department for course descriptions and instructors. Admission is by application only. Forms are provided each term for students to indicate their seminar preferences and are available in 125 McGraw Hall. Nominees may be admitted upon application, but department majors are given priority. Majors are encouraged to take at least one seminar course during the junior or senior year.

The following courses are open to sophomores, juniors, and seniors without prerequisites unless otherwise indicated.

American Government and Institutions

Government 111 is recommended.

[301 The Politics of Regulation 2 credits. Not offered 1983–84 ]

[302 The Impact and Control of Technological Change 4 credits. Not offered 1983–84 ]

[303 American Democracy and the Limits to Growth 4 credits. Not offered 1983–84 ]

[309 Interpretation of American Politics 4 credits. Not offered 1983–84 ]

310 Power and Poverty In America Spring. 4 credits. R. King. The United States is a stratified society conspicuous for great disparities in the allocation of income and wealth. Determined political institutions, one might have expected, would redress these disparities. Instead, redistribution has been largely accidental. After reviewing the surprisingly small net fiscal effect of the federal government, we shall turn to explicitly 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 partition of political power, to the modes of organization and participation of the poor, and to conditions necessary for significant redressments in policy focus.

[311 Urban Politics 4 credits. Not offered 1983–84 ]

312 Urban Affairs Laboratory Fall and spring. 4 credits. Open to both undergraduate and graduate students. Application required to assure balanced enrollment from different colleges and majors. Applications available in 125 or B29 McGraw Hall. Course fee $20. P. C. Vaughan. 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 policy 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 role of courts, legislatures, and administrative agencies in the legal process is analyzed, considering also the constitutional limits on their powers and practical limits on their effectiveness. Readings consist mainly of judicial and administrative decisions, statutes and rules, and commentaries on the legal process.

[314 Common Law and Lawyers in America 4 credits. Not offered 1983–84 ]

[316 The American Presidency 4 credits. Not offered 1983–84 ]

317 Political Parties and Elections Spring. 4 credits. B. Ginsberg. The relationship between citizen participation and public policy is one of the central questions of democratic politics. This course will focus on American voting behavior, the role of political parties, and the links between citizens' choices at the polls and the behavior of public officials.

318 The American Congress Spring. 4 credits. M. Shelter. 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.

[319 American Political Behavior 4 credits. Not offered 1983–84 ]


[322 Criminal Justice 4 credits. Not offered 1983–84 ]

323 The "Fourth" Branch Fall. 4 credits. J. Rabin. The national administrative branch is examined. Particular attention is given to the constitutional and political problems that result from the rise of administrative power.

[327 Civil Liberties in the United States 4 credits. Not offered 1983–84 ]

[328 Constitutional Politics: The United States Supreme Court 4 credits. Not offered 1983–84 ]

[329 Race, Gender, and Politics 4 credits. Not offered 1983–84 ]

353 The Feminist Movement and Public Policy (also Women's Studies 353) Fall. 4 credits. M. Katzenstein. The course examines the 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, 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.

361 The Politics of Regulation Fall. 4 credits. J. R. Lowi. An examination of the conventional social science question: Who rules America? Attention will be given to competing interpretations of the partition of political power, to the modes of organization and participation of the poor, and to conditions necessary for significant redressments in policy focus.


332 Politics and Society in France and Italy Fall. 4 credits. S. G. Tarrow. A comparative treatment of the political traditions, governmental institutions, and policy problems of two countries with deep social cleavages, vigorous multiparty systems, and special connections to the United States. Special attention is given to problems of economic planning and social policy, the role of the communist party in each country, and the place of Italy and France in Europe.

333 Government and Politics of the Soviet Union Fall. 4 credits. M. Rush. A focus on the politics of the top leaders, the instabilities 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 Spring. 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, unionization and class consciousness in continental 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 corporate, immigration, 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.


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.


346 Politics in Contemporary Japan. Spring 4 credits. T. J. Pempel

The focus will be on the political, social, and economic delimters of policymaking in postwar Japan, with some particular attention given to ideological conflict, political parties and elections, the bureaucracy, the consumer movement, student protest, defense policy, and economic penetration of Southeast Asia.

347 Chinese Government and Politics Fall. 4 credits. V. Shue

An examination of the politics of modern China, including the breakdown of the traditional order and the revolutionary struggle of the Chinese Communist party. Primary emphasis on the institutions, methods, policies, and problems of the Communist regime since 1949.


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.


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 democratc 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.


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 characterizes these changes in a number of fields (trade, money, energy, technology), explains them as the result of the political choices of a declining imperial power, and examines their consequences for America and international politics.


356 Elites and Society: The Political Economy of Power Spring. 4 credits. N. T. Uphoff

For students who have an interest in the nature and uses of power in politics. Consideration of how power has been treated by earlier political thinkers and by contemporary social scientists. Propositions will be formulated and critiqued about the distribution and consequences of power in America, other industrialized societies, and in the Third World, and their implications for the making of public policy. A game-simulation, "Third World Power Play," is undertaken at the end of the course.


358 Politics of the Middle East (also Near Eastern Studies 294) Fall. 4 credits V. Dann

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.

359 Social Movements and Politics in Industrial Societies Spring. 4 credits. S. G. Tarrow

Studies of historical and contemporary social movements and left-wing parties in Western Europe and the United States, with an emphasis on the relations between movement strategies, between political alliances and policy outcomes.


446 Comparative Communism Spring. 4 credits. M. Rush

This seminar deals with regimes that claim to be committed to the Marxist-Leninist program for the realization of socialism and communism. Similarities and differences among countries of the Soviet bloc, China, and Yugoslavia are investigated.


457 Comparative Public Law: Legal Controls on Government in Europe and America. Fall. 4 credits. J. Robkin, S. Jasanoft

This course examines the legal and institutional framework of government regulation in advanced industrial nations. It considers how different national systems balance the need for adaptive policy with the desire for legal consistency, the demands of specialized expertise with the claims of democratic control, the protection of private rights with the vindication of public interests. Case studies dealing with civil liberties and health and safety regulation in several different countries will illustrate these problems.


Political Theory

Government 161 is recommended.


364 Liberty, Equality, and the Social Order Fall 4 credits. D. Meyers

We consider the accounts of liberty and equality provided by several major political philosophers, including Hobbes, Locke, Rousseau, and Mill, and we examine their proposals for embodying these concepts in political institutions. We will also read recent discussions of these issues.


368 Economic Models of Politics Fall. 4 credits. E. W. Kelley

Economic factors influencing the structure of political systems and economic models of such systems are considered. The rationalistic presumptions underlying some such models are introduced and modified. Applications to enduring policy arenas may be made.


375 American Political Thought 4 credits Not offered 1983–84.

376 Marx after One Hundred Years 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 their applicability to the current crisis in the world economy and the varieties of political response (Euro-communism, socialism, feminism, ecology movements, antimilitary 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-Freiudian revisions of the theory, including Left Freudianism, ego-psychology, and radical feminism.


467 Current Topics in Political Philosophy (also Women's Studies 467) Spring. 4 credits. D. Meyers

This course will explore the philosophical dimensions of current political issues. Topics will vary but could include equal opportunity, capital punishment, free speech, and the like. Emphasis will be placed on careful analysis of issues and methods of normative justification.

468 The Theory and Politics of Liberal Feminism Spring. 4 credits. M. Katzenstein, D. Meyers

A study of the assumptions and arguments of liberal feminism. The course will have three foci. It will examine the doctrines of liberal feminism, consider how these doctrines translate into political issues and programs, and appraise the merits of the critique from the left and right.
International Relations

Government 131 is recommended.

381 The Politics of Defense Spending Fall. 4 credits J. Reppy.
An analysis of U.S. military programs and budgets in the post–World War II period. Topics covered will include an overview of the defense budget process, special characteristics of the defense market, behavior of defense firms, and domestic factors shaping the arms race. There will be occasional guest lectures by visitors to the Peace Studies Program.

382 Integration in the World System Fall. 4 credits S. Jackson.
This seminar explores theories of interdependence, regional integration, and dependency as particular applications of the generalized concept of integration in the world system. Readings include works by Deutsch, Haas, Keohane, Nye, Lenien, Cardoso.

383 Theories of International Relations Spring. 4 credits R. Rosecrance.
A survey of relevant theories of international relations, emphasizing war prevention and conflict resolution. Theories will be tested against the international experience of the past two centuries.

384 War and Peace in the Nuclear Age (also Physics 209). Spring. 4 credits P. Stein.
Intended for students wishing to understand the following: the 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 nuclear arms control negotiations. Additionally, the course will examine critically the important concepts involved in military strategy and arms control, current issues in military posture and arms control negotiations, and the moral and ethical questions involved.

385 Contemporary American Foreign Policy Fall. 4 credits R. Rosecrance.
An analysis of the dilemmas that have confronted American foreign policy since 1945, both specific problems and more general questions of capabilities, priorities, and morality.


387 The United States and Asia Fall. 4 credits G. McT. Kahin.
The relations of the United States with the major states of Asia and with those smaller countries (especially Vietnam) with which it has been particularly concerned are analyzed. Attention is also given to the relationship of American policy to the Asian policies of France, Great Britain, and Soviet Russia.

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.


478 Accumulation on a World Scale Spring. 4 credits S. Jackson.
In Accumulation on a World Scale, Samir Amin has developed the nearest thing to a comprehensive explanation for underdevelopment in the periphery of the world system to emerge from recent critical theorists of global political economy. In this course we will examine Amin's chapter by chapter, looking at the growing body of systematic evidence relevant to an evaluation of Amin's theory.

479 Dependencia and the State Fall. 4 credits S. Jackson.
In this course we will examine closely a sampling of the principal theoretical and empirical works that seek to explain the constraints on, and possibilities for, state action in dependent societies, focusing particularly on those factors arising directly from the location of countries in the global system, including the roles of multinational corporations, the World Bank, and military aid.


481 Foreign Policy of the USSR 4 credits. Not offered 1983–84.


483 Political and Economic Interdependence Spring. 4 credits R. Rosecrance.
The political and economic interdependence among nations, both historical and contemporary, is studied. The international systems of mercantilism, nineteenth-century laissez-faire, and economic nationalism of the 1930s are reviewed briefly. Emphasis is on contemporary situations and data.

484 Defense Strategy Fall. 4 credits R. N. Lebow.
The requirements for military defense and the problems caused by it are analyzed. Subjects include nuclear deterrence reasoning, military strategy, approaches to disarmament, the working of military-industrial complexes, and defense budgeting and policy procedures.

487 Covert Intervention as an Instrument of American Foreign Policy Spring. 4 credits G. McT. Kahin.
The character and conduct of a dimension of policy that has attained major importance in recent decades. Focuses on cases drawn from Asia, Latin America, and the Middle East, with analyses of the impact of these interventions on the socioeconomic and political character of the countries subject to and of the extent to which these policies influence and constrain the overt level of U.S. policy.

488 Crisis and Change in the International Political Economy (also Business and Public Administration NCE 510) Spring. 4 credits. Prerequisite: permission of instructor. P. Katzenstein.
This course analyzes the political consequences of the decline in American power for the international economy. The political constraints and opportunities of global economic competition are examined in a number of different geographical settings: Western Europe, Eastern Europe, Latin America, the Middle East, and Asia. Guest lectures by other members of the Cornell faculty will be an integral part of 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.

400 Honors Seminar: Political Analysis Fall. 4 credits. Limited to students admitted to the honors program.

494 Honors Thesis Clarification and Research Fall. 4 credits. Limited to students who have successfully completed Government 400 or are taking it concurrently.

Staff

Each student works individually with a faculty member. The student initiates the tutorial by interesting a faculty member in his or her likely thesis project and by submitting, to the director of undergraduate studies, a form outlining the general area the thesis will treat and bearing the faculty tutor's signature. This form is due the third week of classes. The tutorial culminates in a thesis of some sixty to eighty pages, submitted in two bound copies by the end of the class. The grade for the tutorial is determined by the faculty tutor, while the degree of honors (if any) awarded the thesis is decided by a committee of faculty established for that purpose.

Supervised Study

Except under very unusual circumstances, supervised study, Government 499, is open only to government majors doing superior work in the major. The application form may be obtained in 125 McGraw Hall and must be approved by the director of undergraduate studies for credit to be granted. There is no limit established for the total number of credits 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

Qualified undergraduates are encouraged to apply for seminars listed with 600 course numbers. Students may consult the supplement that lists graduate courses, available in the department office.

Field Seminars

601 Scope and Methods of Political Analysis Fall. 4 credits. S. Jackson.
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.

Field Seminar in Political Methodology Fall. 4 credits. B. Ginsberg. 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.

Field Seminar in Public Policy Fall. 4 credits. E. W. Kelley. An introduction to the study of public policy. Various analytical approaches will be presented: models of public choice and political economy; analysis of bureaucratic politics, executive and political leadership, and interest groups and public opinion; economic analysis of public finance and welfare economics; and organization theory, game theory, and decision theory as these relate to the analyses of public policy formation and applications.

Field Seminar in Comparative Politics Spring. 4 credits. V. Shue, S. Tarrow. An introduction to selected theoretical problems in the study of comparative politics and to their application in empirical analysis. Basic problems are social class and politics, authority and legitimacy, participation and mobilization, economic development and democracy, authoritarian and totalitarian politics, corporatism and pluralism, nation building and political integration.

Field Seminar in International Relations Spring. 4 credits. R. N. Lebow, P. Katzenstein. A general survey of the literature and propositions of the international relations field. Criteria are developed for judging theoretical propositions and are applied to the major findings. Participants will be expected to do extensive reading in the literature as well as research.

Field Seminar in Political Thought Fall. 4 credits. W. J. Dannhauser. An introduction to political theory through a reading of selected classics in political thought from Plato to Marx.

American Government and Institutions


Capitalism, the State, and the Economy 4 credits. Not offered 1983-84.

Public Policy

Politics of Decision Making in Areas Traditionally Regarded as Technical. Subjects include 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.

Comparative Government


Comparative Theories of Decentralization 4 credits. Not offered 1983-84.

Politics of the Soviet Union Fall. 4 credits. M. Rush. A reading seminar on major works dealing with the Soviet political system, with special emphasis on higher politics, recent foreign policy, the national identity question, and the Brezhnev succession.


Politics in China Spring. 4 credits. V. Shue. A wide-ranging introduction to contemporary Chinese political theory and practice. Several different approaches to the study of Chinese politics are considered and evaluated. Topics include the political legacies of the revolutionary civil war; the development of Mao Tse-tung's thought and the terms of political discourse in China; the collectivization of agriculture and the evolution of Chinese economic development strategy; forms of political participation and the means by which social cleavages gain political expression; the system-wide impact of the Cultural Revolution; the social bases of ultraleftism; Chinese revisionism; and patterns of elite politics.

Political Anthropology: Indonesia (also Anthropology 628) Spring. 4 credits. Prerequisite: reading knowledge of Indonesian.

The relationship of politics to culture is studied through the works of such authors as Ivan Simatupang, Pramoedya Ananta Toer, and Armijn Pané.

Political Economy of Change: Rural Development in the Third World Fall. 4 credits. N. T. Uphoff. The substantive focus is on economic, social, and political change in Third World countries, particularly with reference to rural development. The analytical approach integrates economic, social, and political factors into a common framework for dealing with policy choices and political action. Special attention is given to different instruments for promoting rural development in Third World countries.

Readings from Mao Zedong 4 credits. Not offered 1983-84.

Political Problems of Southeast Asia Spring. 4 credits. G. McT. Kahin. A broad range of problems are dealt with, the focus different each term.


Politics in Postwar Western Europe 4 credits. Not offered 1983-84.

Research Topics on Advanced Industrial Democracies: Social Movements, Collective Protest, and Policy Innovation Spring. 4 credits. S. G. Tarrow. Students will read and carry out case studies on historical or contemporary West European and American protest movements, their programs, and the responses—whether repressive or policy-innovative—of political elites. Theories of collective action and resource mobilization will be studied and used in explicating cases.

Political Theory

American Political Thought 4 credits. Not offered 1983-84.

The Political Philosophy of Nietzsche 4 credits. Not offered 1983-84.


Readings in Contemporary Social Theory 4 credits. Spring. S. Buck-Morss. Issues will include neo-Marxism, structuralism, poststructuralism, and feminism.

Economic Models of Politics Fall. 4 credits. E. W. Kelley. Both economic factors influencing the structures of political systems and economic models of such systems are considered. The rationalist presumptions underlying such models are introduced and modified. Applications to enduring policy arenas may be made.

Greek Political Philosophy Fall. 4 credits. W. J. Dannhauser. Studies in the political thought of Plato and Aristotle. Readings will consist of Plato's Republic and Laws, Aristotle's Ethics and Politics.

International Relations

International Strategy Fall. 4 credits. R. Rosecrance. Doctrines of deterrence and defense, particularly their interaction in American policy since 1945, are focused on. The relationship between doctrine and the type of international system (bipolar or multipolar) is considered, and other means of equilibration in the international system are investigated.

International Relations of Asia Fall. 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.

The Administration of Agricultural and Rural Development Spring. 4 credits. N. T. Uphoff. The political, bureaucratic, economic, and technical environments of administration for agricultural and rural development; the various functions involved in administration (personnel management, planning, budgeting, economic analysis, information systems); several major tasks (research, extension services, and infrastructure development); and specific problems of integrating activities, interfacing with rural populations, and utilizing external assistance. Intended primarily for persons who expect to have some future responsibilities in agricultural or rural development administration in Third World countries.
Greek
See Department of Classics, p. 118.

Hebrew
See Department of Near Eastern Studies, p. 173.

Hindi-Urdu
See Modern Languages, Literatures, and Linguistics, p. 158.

History

The popularity of history among Cornell students is due to its usefulness as preparation for graduate, professional, or law school and for any career that requires critical thinking and good writing; the reputation of the faculty for scholarship, teaching, and advising; and most of all, the intrinsic interest of the discipline. A wide variety of introductory and advanced courses is offered. The department is particularly strong in ancient, medieval, and modern European history; in American, Latin American, Chinese, and Southeast Asian history; and in the history of science.

The Major
To complete the major, a student must fulfill the requirements listed below:

1. Complete the prerequisite requirement by taking either Introduction to Western Civilization (History 151–152) or Introduction to Asian Civilization (History 190–191) or, alternatively, three courses in European history—one in ancient history; one in medieval, Renaissance, or early modern history; and one in modern history.

2. Take history department courses totaling 36 credits (which may include the prerequisite courses) and complete all these courses with a grade of C or better—of the 36 credits, a minimum of 20 must be taken in courses numbered 250 and above.

3. Take a minimum of 8 credits in each of two of the following fields: American, European, Asian, Latin American history, or history of science; alternatively, a student may elect to take a total of 16 credits in three of these fields. Credits taken to fulfill the prerequisite requirement (see item (1), above) do not count toward this requirement.

4. Take at least one course at the advanced (400 or higher) level.

5. Take two courses above the elementary level offered by other departments that relate to the student's area of special interest.

Prospective majors may wish to discuss their projected program with the director of undergraduate studies before formally enrolling with the department.

Honor. History majors with an overall B+ average in all their history courses are eligible to enroll in History 400, Honors Proseminar, which is normally taken in the junior year or, at the latest, in the fall of the senior year. (Honors candidates are strongly encouraged to take another history seminar during their junior year.) Upon successful completion of the proseminar, students may become candidates for the degree of Bachelor of Arts with honors in history by submitting to a prospective faculty advisor a written thesis proposal delineating the general area of inquiry for an honors essay, and having the proposal approved by the adviser. The proposal should be submitted as soon as possible after the completion of History 400, normally during the junior year or at the beginning of the senior year.

After acceptance of the proposal by an adviser, honors candidates should then enroll with their advisers in History 302, Supervised Research, during the first term of their senior year. History 302 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 302, the student will submit to her or his adviser a ten-to-fifteen-page overview of the entire thesis or a draft of some substantial section of the thesis and will undergo an oral examination on the broad field of history that the student researched. The examination will be administered by a committee consisting of the student's adviser and one other department member, who will eventually serve as a reader of the thesis. The committee will then determine whether the student may proceed to enroll in History 401, Honors Guidance, during the final semester of the senior year. History 401 is a 4-credit course that permits honors candidates to complete the honors essay and to prepare both to defend the essay and to demonstrate their understanding of the general historical interests they have pursued within 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 401 by their final semester.

Honors candidates must complete a minimum of 40 credits in history, 8 of which must be History 400–401. 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 adviser. Two copies will be due during the third week of April. In May each honors candidate will be given an oral examination administered by the major adviser and one 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 oral examination. Students considering the honors program should consult the department during the second term of their sophomore year or early in their junior year.

Freshman Seminars


This course examines individual and group critiques of American society and experiments with alternative lifestyles. Topics include the Puritans, the Oneida community, the Mormons, Walden, the Ferrer Colony and Modern school, Vedanta monasteries, Walden II, and contemporary communes.


A survey of the history of educational thought and institutions from Puritan times to the present, with emphasis on the nineteenth and twentieth centuries. Topics include the family and church as educational institutions, the democratization of education, the emergence of the university, educational testing, and vocational and educational theory. John Dewey and progressive education, "alternate education," student radicalism.


143 Family and Community in Modernizing Societies Fall. 3 credits. M.W. 10 10. N. Schnartzbach.

This course will examine the family and community as critical institutions in modernizing societies. Drawing upon anthropology, sociology, and history, it will explore the relationship between family, community, and modernization. Developments in Japan and Latin America will be compared with those in the United States. Throughout, emphasis will be placed on the critical evaluation of popular assumptions and theoretical perspectives that inform our understanding of the modernization process. Pending approval of the Educational Policy Committee.


This course will focus on the history of ordinary Americans concerned with the daily aspects of living. It will approach nineteenth- and twentieth-century social history through a study of everyday experience. Most people spend most of their life struggling for daily existence at work, interacting within a family, and living in a community. Changes in these aspects of life are enormously revealing and will be approached mainly through the autobiographies and memoirs of the common people and, for the twentieth century, through oral history. Pending approval of the Educational Policy Committee.

[146 America in the Camera's Eye Not offered 1983–84. R. L. Moore.]

147 Slaves and Slaveholders in Antebellum America Fall. 3 credits. M.W. 12. M. P. Lucas.

Black slavery dramatically shaped the southern and American consciousness. Its legacy encompasses the violent Nat Turner, the "Sambo" stereotype, the brutal overseer, and the cavalier gentleman. This Freshman Seminar will examine that slave society from its origins to the Civil War. Specific topics will include the conditions of slavery, slave personality, the relationship of slave to master, and the world as the slaveowners viewed it. Pending approval of the Educational Policy Committee.


This Freshman Seminar will investigate the distinctiveness of the American South from the days of Jim Crow to the Carter presidency. Topics include the plight of black and white sharecroppers, race relationships and conflict, white demagogues, the civil rights movement, and the role of history in the southern consciousness. The readings are drawn from historians' analyses, firsthand accounts, and the
160 The Politics of Natural Man  Spring 3 credits.
M. W. 9:05 J. Oakley
An exploration of the uses of descriptions of humanity in the state of nature in the advocacy of political or social programs. The understanding of natural human as both legal and biological beings has varied widely over the past two thousand years, and the standards and techniques for recreating the state of nature have also changed, but at times descriptions of man in the state of nature have been employed to support political programs. The course will examine the use of those descriptions as rhetorical devices in political discussion. Readings will range from the Greek philosophers to modern advocates of sociobiological and anthropological approaches to human nature and will include Christian and Marxist descriptions. Pending approval of the Educational Policy Committee.

[161 The Heroic Ideal in Antiquity  Not offered 1983–84.
B. Strauss]

W. M. Pinter.]

176 Britain and the Second World War  Spring 3 credits.
Prerequisite: permission of instructor.
T: M. 9:25; W. 2:30–3:30; D. A. Baugh.
The aim is to uncover the true facts of Britain's strategic bombing.

1983-84.

[178 Britain and the Second World War  Spring.
3 credits. Open to sophomores.
Prerequisite: permission of instructor.
The war will range from the Greek philosophers to modern advocates of sociobiological and anthropological approaches to human nature and will include Christian and Marxist descriptions. Pending approval of the Educational Policy Committee.

208 Anarchism in America and Europe  Spring 4 credits.
Prerequisite: permission of instructor.
T: R 12:20–1:35; R. Polenberg.
Topics include Proudhon, Bakunin, and Kropotkin; the Haymarket riot; anarchism and socialism; the IWW and anarcho-syndicalism; anarchists in the Russian Revolution; Emma Goldman and Alexander Berkman; the red scare and the Sacco-Vanzetti case; the Spanish civil war; the libertarian tradition.

209 Political History of North American Indians during the Eighteenth and Nineteenth Centuries  Not offered 1983–84; next offered 1984–85.
D. H. Usner.

214 Seminar on American Foreign Policy  Spring 4 credits.
Open to sophomores.
Prerequisite: permission of instructor.
T: W 12:20–2:20; R. M. Pinter.
An examination of the interrelationships of the Imperial American foreign-policy problem, analyzing its various parts and charting the possible alternatives open to policy makers by placing the problem in its historical framework and using, in part, the methods of comparative history. History will be used as a tool to analyze the complexities and opportunities of present foreign-policy dilemmas.

218 The Russian Military Effort and Foreign Policy  Spring 4 credits.
W. 12:20–2:20; W. M. Pinter.
An examination of the interrelationships of the Imperial American foreign-policy problem, analyzing its various parts and charting the possible alternatives open to policy makers by placing the problem in its historical framework and using, in part, the methods of comparative history. History will be used as a tool to analyze the complexities and opportunities of present foreign-policy dilemmas.

221 History of North American Indians  Spring 3 credits.
Prerequisite: permission of instructor.
W: F 10:10; D. H. Usner.
This seminar examines major themes in Native American history from colonial times to the present. Discussions will consider the cultural histories of particular tribes and the interaction and conflict with non-Indians.

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, Huskey, 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, Barrie, Maugham, O'Casey, Sherrill, and Eliot.

[227 Modern American Sex Roles in Historical Perspective (also Women's Studies 227)  Not offered 1983–84; next offered 1985–86.
M. B. Norton.]

232 The City In History  Spring 4 credits.
Limited to 12 students.
R: T 10:10–12:05; S. Blumien.
Reading and discussion of classic interpretations of the rise, role, and character of cities in ancient Greece, medieval Europe, and nineteenth- and twentieth-century Europe and America. Further reading on the history of a particular city of the student's own choice. Several short papers.

Comparative History

274 Foodways: A Social History of Food and Eating  Spring 4 credits.
W: 2:30–4:30; S. L. Kaplan.
An interdisciplinary examination of the validity of the adage that "food 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  Not offered 1983–84; next offered 1984–85.
C. A. Peterson]

449 Comparative Race Relations in the Americas  Fall 4 credits.
An examination of race relations in the Western Hemisphere since the colonial era. Topics include the origins of slavery in the Portuguese, Spanish, and English colonies; alternative forms of slavery and resistance; the abolition process; and divergent patterns of postabolition race relations in Latin America, the Caribbean, and the United States.

History of Science

L. P. Williams.]

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.
R: T 10:10–11:30; 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.
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.
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.


D. H. Usner.

330 The United States in the Middle Period, 1815–1850 Fall. 4 credits.

M W F 10:10. disc to be arranged. J. H. Silbey.

An analysis of American society from the end of the second war with England to the crisis of 1850, stressing the developing trends of nationalism and sectionalism, the rise and results of Jacksonian democracy, and the internal tensions produced by physical growth and slavery.

331 The American Civil War and Reconstruction Spring. 4 credits.

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 restoration and reconstruction of the seceded states.


S. Blumin.

336–337 American Social History 336 fall; 337 spring. 4 credits each term. History 336 is not a prerequisite to 337.

M W F 11:15. S. Blumin.

A history of American society, with emphasis on the transforming effects of such phenomena as industrialization, urbanization, immigration, national expansion, and institutionalization on the social life of anonymous Americans. The first semester will cover the colonial and Jacksonian eras, with emphasis on the former; the second semester will focus upon the industrial-urban transformation of the period 1860–1930.

340 Recent American History, 1917 to 1945 Fall. 4 credits.

T R 12:20. disc to be arranged. R. Polenberg.

Topics include civil liberties and dissent in World War I; individualism and conformity in the 1920s; radicalism and reform in the New Deal; class, race, and ethnicity; Franklin Roosevelt and World War II; the Holocaust and the atomic age.


R. Polenberg.

344 American Ideas from the Puritans to Darwin Fall. 4 credits.

M W F 1:25. F. Somkin.

Ideas, thinkers, feeling, and expression from the seventeenth century to the Civil War. Topics include Puritanism, the Enlightenment, Jeffersonian and Jacksonian democracy, antebellum reform movements, the attack on natural rights, and the effect of Darwinian evolution on traditional American ideals.


R. L. Moore.


R. L. Moore.

411 Undergraduate Seminar in American Political History Not offered 1983–84.

J. H. Silbey.

414 Motivations of American Foreign Policy Fall. 4 credits. Prerequisites: History 314 and permission of instructor.


418 Undergraduate Seminar in the History of the American South Spring. 4 credits. Prerequisite: permission of instructor.


Topic for 1984: Slavery, the slave system, and the crisis of the Union, 1846–1861.

[419 Seminar in American Social History Fall. 4 credits. Prerequisite: permission of instructor.


Topic for 1983: Capitalism, class, and community in nineteenth-century North America. Readings, discussion, and original research on the varying impact of capitalist-industrial development on the class and communal systems of American cities, towns, and villages.

421 Constitutionalism as a Cultural Problem in America Spring. 4 credits. Prerequisite: permission of instructor.


The seminar (primarily for juniors and seniors, but open to graduate students and law students) will examine the changing role of the U.S. Constitution in American politics and ideological controversy. Coverage will begin with the John Marshall era, but our major concern will be the period 1860–1980.

[426 Undergraduate Seminar in Early American History Not offered 1983–84; next offered 1984–85.

M. B. Norton.

429 Undergraduate Seminar in Indians of Eastern North America Spring. 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.


An undergraduate seminar covering (1) an overview of the development of American law from colonial times to the twentieth century; and (2) an examination of selected topics such as vigilant justice, criminal responsibility, gun laws, the present agony of the criminal justice system, and the dissolution of social authority.

440 Undergraduate Seminar in Recent American History Spring. 4 credits. Prerequisite: permission of instructor.


Topic for 1984: The Supreme Court and free speech: Holmes, Brandes, and Frankfurter.


R. L. Moore.


F. Somkin.

[617–618 Seminar in Recent American Cultural History Not offered 1983–84.

R. L. Moore.


S. Blumin.
Every society has some myth (or myths) about its own identity, characterized by unrealistic beliefs that serve realisitic social or psychological functions. The focus of this seminar will be to examine the role of myth in American cultural tradition against the context of European as well as Chinese and Australian traditions. There will also be contextual readings on nationalism and mythology in general.

626 Graduate Seminar in the History of American Women Fall. 4 credits. Consent of instructor required.


710 Colloquium in American History Spring. 4 credits.
M 2:30–4:30. J. H. Silbey

Asian History

190 Introduction to Asian Civilizations Spring. 4 credits.
T R 11:15 plus disc, M 11:15, 1:25, or 2:30. C. A. Peterson and staff.
An introduction to the distinctive cultures of China, India, and Japan, which features an intensive examination of selected topics and periods of particular significance in the history of each.

191 Introduction to Asian Civilizations in the Modern Period Fall. 4 credits.
W F 11:15 plus disc, M 11:15, 1:25, or 2:30. S. Cochran.
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.

390 Art and Society in Modern China Not offered 1983–84. S. Cochran, M. Young.

393 History of China up to Modern Times Fall. 4 credits.
T R 10:10 plus an additional hour, M 11:15 or 2:30. C. A. Peterson.
A broad examination of the major aspects of Chinese culture and civilization from earliest times to the late imperial period. Seeks to expose both those features maintaining continuity and the significant (but frequently overlooked) instances of change.

394 History of China in Modern Times Spring. 4 credits.
T R 10:10 plus an additional hour, R 12:20, 2:30, or 3:35. 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 Indochina and the Archipelago to the Fourteenth Century Fall. 4 credits.
T R 11:15 plus one hour to be arranged. O. W. Wolters.
A survey of the early history of Indochina and the archipelago, with particular attention to questions raised in the source material concerning religious beliefs and political and social assumptions.

Spring Courses

489 Seminar in Tokugawa Thought and Culture Not offered 1983–84. J. V. Koschmann.

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 fall 1983: The Mongols in world history.

493 Self and Society in Late Imperial and Twentieth-Century China Fall. 4 credits. Prerequisite: History 191, 394, or permission of instructor.
R 2:30–4:30. S. Cochran.
Conceptions of self and relationships between the individual and society in China from the seventeenth century to the present.

495 The Historiography of Southeast Asia Fall. 4 credits. Prerequisite: permission of instructor.
Hours to be arranged. O. W. Wolters.

496 The Historiography of Southeast Asia Not offered 1983–84; next offered 1984–85. D. K. Wyatt.

971–972 Seminar in Medieval Chinese History 791, fall; 792, spring. 4 credits each term.
Prerequisite: permission of instructor.
Hours to be arranged. C. A. Peterson.

973–974 Seminar in Modern Chinese History 793, fall; 794, spring. 4 credits each term.
Prerequisite: permission of instructor.
Hours to be arranged. S. Cochran.


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 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, Aristotle, and from the evidence of ancient inscriptions, coins, art, and architecture.

373 The Greek City from Alexander to Augustus Spring. 4 credits. Enrollment limited.
M W 11:15; disc to be arranged. B. Strauss.
A two-fold search: for Alexander the conqueror and the man, and for the character of the world he created, in which the Greek city was planted as far as Egypt and India. These new cities saw a change from republicanism to monarchy, from community values to individualism, from particularism to ecumenicism; embraced the new philosophies of Stoicism and Epicureanism; and were the hothouses of a new religion: Christianity. Readings in translation include Aman, Plutarch, Aristophanes, Xenophon, Theocritus, Polybios, the Bible, Epicurus, Lucretius.

381–382 Parents and Children in Athens and Jerusalem (also Society for the Humanities 381–382 and Near Eastern Studies 381–382) Frederick G. Marsham Seminar 381, fall; 382, spring. 4 credits. Enrollment limited. Permission of instructor required.
Fall: W 2:30–4:30. Spring: Irregular class meetings. In spring students will pursue independent work in consultation with the instructors and the class will meet for special events and presentations by class members. C. Kronfeld, B. Strauss.

The focus is on the images and reality of parent-child relations in ancient Athens and Israel, with particular emphasis of the two central Mediterranean cultures serving as main texts. Questions to be examined both from the historian's and from the literary critic's point of view include parenthood in the Homeric epic and in Biblical narrative, the gender gap and the tension between emulation and rebellion, gender stereotypes of parent and child images, and the theme of war and child sacrifice. For comparative purposes and attention will be paid also to the images of parent-child relations in modern Greece and Israel as well as in the Greek and Jewish diasporas. Students who wish to read the literature in the original languages will be supplied with appropriate texts.


453 Crisis of the Greek City-State, 415–336 B.C. Spring. 4 credits. Enrollment limited. Prerequisite: History 265 or permission of instructor.
The fortunes of the city-state and citizen in an age of uncertainty. Topics include the causes and course of the war between the city-states, the rise of Macedon, changes in the Athenian character, the tension between individual community, and the decline of classicism and rise of emotionalism. Particular attention will be paid to assessments of Greece's problems in contemporary history, philosophy, oratory, and drama and to developments in religion and art. Readings in translation from Thucydides, Sophocles, Euripides, Aristophanes, Xenophon, Isocrates, Demosthenes, Plato, Aristotle, Plutarch, Isaeus, and Aeschines.

Medieval, Renaissance, and Early Modern European History

151–152 Introduction to Western Civilization 151, fall; 152, spring. 3 credits each term. History 151 is not a prerequisite to 152. Neither 151 nor 152 may be taken as Freshman Seminars.
T R 9:05; disc to be arranged. L. P. Williams.
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...
A survey of medieval civilization from ca. 1100 to ca. 1500. 365 Medieval Culture, 400-1150. 366 Seminar in Medieval History Fall. 3 credits. Prerequisite: History 263-264 or permission of instructor. T R 10:10-11:25. B. Tierney.

367 Church and State During the Middle Ages Fall. 4 credits. Prerequisite: History 263-264 or permission of instructor. T R 3-4:15. B. Tierney.


374 War, Trade, and Empire, 1500-1815. 375 The Old Regime: France in the Sixteenth, Seventeenth, and Eighteenth Centuries. Not offered 1983-84. S. L. Kaplan.


377 History of England under the Tudors and Stuarts Fall. 4 credits. T R 8-9:05, disc 9:05 and 11:15. S. Amussen. A lecture-discussion course focusing on particular themes in the history of early modern England. Topics include social and demographic change, popular culture, religion, and political culture. Special attention will be paid to relationships between the themes and political and social conflicts of the period.


379 History of Poland. Fall. 4 credits. S. L. Kaplan.

381 Latin Paleoigraphy Fall. 4 credits. Not offered spring 1985. I. V. Hull.

382 Russian History to 1800. Fall. 4 credits. Open to freshmen. T R 10:10-11:25. W. M. Pinkter.


384 Social and Cultural History of Contemporary Europe. Spring. 4 credits. M W F 10:00-10:50. R. Bloobum. Everything you wanted to know about Polish history and more. The course, through a format of both lecture and discussion, covers the length and breadth of the Polish historical experience from Slavic antiquity to the present. It is divided into three distinct units focusing on the rise and fall of the first Polish state, the period of the partitions and the struggle for national liberation, and the problematic nature of Polish statehood in the twentieth century.


386 Seminar in Latin Paleography Fall and spring. 4 credits. Not offered 1983-84; next offered spring 1985. I. V. Hull.

387 Society and Cultural History of Contemporary Europe. Spring. 4 credits. M W F 10:00-10:50. R. Bloobum.

388 War, Trade, and Empire, 1500-1815. Fall. 4 credits. 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.


392 The transformation of European society and culture in the thirtieth century, including a critical examination of modernization as an interpretative 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.

393 Social and Cultural History of Contemporary Europe. Spring. 4 credits. M W F 10:00-10:50. R. Bloobum. Everything you wanted to know about Polish history and more. The course, through a format of both lecture and discussion, covers the length and breadth of the Polish historical experience from Slavic antiquity to the present. It is divided into three distinct units focusing on the rise and fall of the first Polish state, the period of the partitions and the struggle for national liberation, and the problematic nature of Polish statehood in the twentieth century.

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 of 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 Fall 4 credits. Open to upper-level undergraduates. Prerequisite: permission of instructor. M 12:20–2:15. I. V. Hull. 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.


454 Eastern Europe Since 1945 Fall. 4 credits. T 12:20–2:15. R. Blobaum. The social, economic, intellectual, and political history of Eastern Europe since the Second World War. Major issues and events will be examined within the broad context of the changing nature of Soviet domination, the vicissitudes of East-West relations, and general trends affecting the entire region. Special emphasis on the mechanics of the "takeover process" at the end of the war. Stalization, the Yugoslav experiment, the revolt of East German workers in 1953, the Hungarian revolt of 1956, the Prague Spring and the Warsaw Pact invasion of Czechoslovakia, and the series of political upheavals in Poland.

[456 Seminar on Germany, 1890–1918 Not offered 1983–84. I. V. Hull.]

[457 Seminar in European Fascism Not offered 1983–84; next offered spring 1985. I. V. Hull.]


467 Seminar in Modern European Political History Spring. 4 credits. Prerequisite: Permission of the instructor. Hours to be arranged. J. H. Weiss. Topic for 1984: Europe and World War II. The military and civilian experience during the war; grand strategy and social change on the home front. The impact of Allied decisions and ideological offensives upon the European theater.

[471 Russian Social History Fall. 4 credits. Prerequisite: one semester of Russian history or permission of instructor. M 2:30–4:30. W. M. Pinter. A seminar devoted to an examination of the diverse social groups that comprise imperial Russia and Soviet society. Includes systematic comparison with other countries.]


476 Documenting the Depression: Film, Literature, and Memory Fall. 4 credits. Prerequisite: permission of instructor. Hours to be arranged: one screening session and one disc per week. J. H. Weiss. Social and intellectual history of Britain and America in the 1930s, with special attention to modes of documentary expression and to subjects lending themselves to treatment by film or oral history: work, popular culture, changes in urban and rural communities, family life, and poverty and unemployment.


480 Twentieth-Century Britain 4 credits. Not offered 1983–84. D. A. Baugh. Lectures focus on key personalities. Seminar topics include Ireland, the 1930s, the world wars and their impact, the decline of liberalism and rise of Labour, the roots of Britain's economic problems, and the character of English society.

[483 Seminar in Modern European Social History Fall. 4 credits. Not offered 1983–84. J. H. Weiss.]


[488 Seminar in European Intellectual History Not offered 1983–84. D. LaCapra.]

489 Seminar in European Intellectual History Spring. 4 credits. Hours to be arranged. D. LaCapra.

497 Seminar in Russian History Fall. 4 credits. Hours to be arranged. W. M. Pintner.


[499 Seminar in European History Not offered 1983–84. S. L. Kaplan.]

Latin American History

295 Colonial Latin America Fall. 4 credits. M W F 10:10. T. H. Holloway. Survey of Latin America from the rise of pre-Columbian civilizations through the European conquest, the establishment of the Spanish and Portuguese colonial societies, imperial rivalries in the New World, the background of the independence movements, and the achievement of political independence.

296 Latin America in the Modern Age Spring. 4 credits. M W F 10:10. T. H. Holloway. Survey of the Latin American nations from independence to the present. Major themes include the persistence of neocolonial economic and social institutions, the development of nationalist and populist politics, revolutionary movements of the twentieth century, and United States-Latin American relations.

The Carolingian Renaissance 4 credits.

Introduction to Art History: The Baroque Era 3 credits.
MWF 10:10-10:35. Staff.

Introduction to Art History: Modern Art 3 credits.


Introductory Courses

The following courses are designed to introduce students to the processes and methods of art history by means of a systematic examination of a closely related body of visual material. The courses need not be taken in any particular sequence. One 200-level course is normally the prerequisite to courses at the 300 level.

215 Introduction to Art History: African Art 3 credits.

220 Introduction to Art History: Art of the Classical World (also Classics 220) 3 credits.
MWF 9:05-10:15. A. Ramage.

221 Introduction to Art History: Minoan-Mycenaean Art and Archaeology (also Classics 221) 3 credits. Not offered 1983-84.


240 introduction to Art History: The Renaissance Fall. 3 credits.
MWF 9:05; one disc, M 1:25, T 9:05 or 11:15, or W 1:25. E. G. Doton.

A study of selected works of architecture, sculpture, and painting in Italy and northern Europe from about 1300 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.
History of Art 145

320 The Archaeology of Classical Greece (also Classics 320) 4 credits. Not offered 1983–84. A. Ramage.

321 The Archaeology of Cyprus (also Classics 321) 4 credits. Not offered 1983–84.

322 Arts of the Roman Empire (also Classics 322) 4 credits. Not offered 1983–84.

323 Painting in the Greek and Roman World (also Classics 323 Spring. 4 credits. M.W.F. 2:30. A. Ramage. 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.

324 Architecture in the Greek and Roman World (also Classics 324) 4 credits. Not offered 1983–84.

325 Greek Vase Painting (also Classics 325) 4 credits. Not offered 1983–84. A. Ramage.

326 Art and Archaeology of Archaic Greece (also Classics 326) 4 credits. Not offered 1983–84.

327 Greek and Roman Coins (also Classics 327) Fall. 4 credits. M.W.F. 2:30. A. Ramage. 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, work with actual examples.


332 Architecture in the Middle Ages (also Architecture 382) Spring. 4 credits. M.W.F. 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.

333 Early Medieval Art and Architecture Fall. 4 credits. M.W.F 11:15. R. G. Calkins. Sculpture, painting, and architecture in the periods from the late Antiquity through the Carolingian era (A.D. 900–990). The evolution of the Byzantine tradition will also be considered.


350 The Culture of the Early Renaissance (also History 361 and Comparative Literature 361) 4 credits. Not offered 1983–84.


357 European Art of the Eighteenth Century Fall. 4 credits. M.W.F 11:15. E. G. Dotson. A study of tradition, change, and revolution in the architecture, painting, sculpture, and minor arts of eighteenth-century Europe. The course will be organized around a selected sequence of European centers where 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 Topics in Modern Art Spring. 4 credits. M.W.F 1:25. L. L. Meiner. Topics for spring 1984 to be announced.


365 Art from 1940 to the Present Fall. 4 credits. T.R. 8:40–9:55. 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.

371 Architectural History of Washington, D.C. Fall or spring. Variable credit. Only for students in the Cornell-in-Washington Program. Only for non-architects. Scott. An 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.


378 American Architecture, the City, and American Thought: 1850–1950 Spring. 4 credits. M.W. 12:20. Disc to be arranged. M. W. Young. American architecture and urbanism approached as cultural history, focusing on such topics as "technology, pro and con," "architecture as metaphor," and "cities: source of virtue or vice?" Extensive reading will be required from works of Thoreau, Greenough, Sullivan, and Wright, and from secondary sources such as Leo Marx's The Machine in the Garden and M. and L. White's The Intellectual versus the City. Some background in American history is assumed.


380 Introduction to the Arts of China Fall. 4 credits. M.W. 12:20. Disc to be arranged. M. W. Young. An introductory course designed for those students who have had no previous experience in art history or knowledge of China. Although the course has a general chronological framework, it is not a survey of Chinese art but an examination of selected masterpieces of Chinese expression in the visual arts, from ancient bronze vessels to modern landscape paintings. Special emphasis will be put on the art of the later centuries, and the course will end with a discussion of art in contemporary China. The collection of the Herbert F. Johnson Museum of Art will be used in conjunction with written assignments.


384 The Arts of Japan Spring. 4 credits. M.W. 12:20. Disc to be arranged. M. W. Young. A general overview of the arts of Japan, intended to introduce the student to the cultural achievements of the Japanese in such areas as architecture, gardens, painting, and sculpture. Although the course will follow a general chronological pattern, the arts will be approached topically, with special concentration on developments in the postmedieval period. The tea ceremony, ceramics, and the minor arts will receive particular attention through study of the Herbert F. Johnson Museum collection. The course will begin with an examination of Japan's earliest pottery traditions and end with a detailed discussion of the wood-block prints of the nineteenth century. The museum collection will be used for written assignments.


401 Independent Study 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.

402 Independent Study 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.


421 History of Art Criticism 4 credits. Not offered 1983-84.


431 Greek Sculpture (also Classics 431) 4 credits. Not offered 1983-84. A. Ramage.


452 Studies in English Art 4 credits. Not offered 1983-84.

454 The Art and Poetry of William Blake (also English 448) Spring 4 credits. T 2:30-3:45. J. Viscomi. An examination of the complete Blake: printmaker, painter, and poet. Special attention will be paid to the illuminated books, color-print drawings, and tempera paintings, and the techniques by which they were made.


459 The Romantic Movement in Poetry, Painting, and Graphic Arts (also English 442) Fall. 4 credits. T 2:30-4:30. J. Viscomi.

In this course we will examine the works of English Romantic poets and artists whose experiments with media have significantly changed our understanding of art. Works include the literature and art of the picturesque: watercolor paintings by Sandyb, Cozens, and Turner; prints by Blake, Gainsborough, and Rowlandson; and lyrical poetry of Wordsworth, Coleridge, Shelley, and Keats. The similarities among these diverse arts, both in technique and theme, will be discussed, as well as the Romantic's attempt to redefine the value of art and the role of the artist in society.


465 Problems in Modern Art and Architecture Spring. 4 credits. Limited to 15 students. Prerequisite: permission of instructor. T 2:30-4:30. T. M. Brown.

475 The Earliest Arts in Colonial America: The Seventeenth Century Fall. 4 credits. T R 12:20-2:15. A. S. Roe. An amplification of History of Art 474, this course will deal only with the arts in New England and the Hudson River Valley prior to 1700. Under consideration will be the earliest objects surviving, which were demonstrably produced in the Colonies during this period, and also those types of objects produced in Europe and elsewhere, which are known to have been imported in significant quantities from the earliest times. The traditions of craftsmanship prevailing in Europe at the time of the arrival of the first settlers in New England will be studied as indicative of the stylist origins that determined the form and decoration of the earliest objects produced in America. In addition to furniture, particular emphasis will be placed upon the art of the silversmith, the first highly sophisticated European craft to be developed in the New World and important not only as the art form that most rapidly transmitted to America the latest stylistic developments in the arts of Europe but also for its economic significance in days when silver was the major medium of exchange and the silversmith performed many of the functions today associated with the banker. The early importation of ceramics, both high style and utilitarian, will also be considered.


481 The Arts in Modern China 4 credits. Not offered 1983-84. M. W. Young.


485 Studies in Chinese Painting Spring. 4 credits. Prerequisite: History of Art 380 or permission of instructor. R 2:30-4:30. M. W. Young.


493 Honors Work Fall or spring. 4 credits. Intended for senior art history majors who have been admitted to the honors program: S-U grades only. Required: Huxley's Brave New World, Freud's Civilization and Its Discontents, and Le Corbusier's Towards a New Architecture can be expected.

500 Seminar in Renaissance Art Spring. 4 credits. M 2:30-4:30. E. G. Dotson.


521 History of Art Criticism 4 credits. Not offered 1983-84.


540 Seminar in Renaissance Art Spring. 4 credits. M 2:30-4:30. E. G. Dotson.


580 Problems in Asian Art Spring. 4 credits. Prerequisite: permission of instructor. W 2:30-4:30. S. J. O'Connor.

591-592 Supervised Reading 591, fall; 592, spring. 4 credits. May be repeated for credit. Limited to graduate students. Staff.


Related Courses in Other Departments


Figurative Arts of Antiquity in the Renaissance (Society for the Humanities 414) Spring.
Indonesian
See Modern Languages, Literatures, and Linguistics, p. 159.

FALCON Program:

Italian
See Modern Languages, Literatures, and Linguistics, p. 159.

Japanese
See Department of Asian Studies, p. 109, and Modern Languages, Literatures, and Linguistics, p. 162.

FALCON Program:
E. Jorden, 321 Morrill Hall, 256-6457.

Javanese

Latin
See Department of Classics, p. 118.

Linguistics
J. W. Gair, director of undergraduate studies (407 Morrill Hall, 256-5110).


Mathematics

Mathematics is the language of modern science; basic training in the discipline is essential for those who wish to understand, as well as for those who wish to take part in, the important scientific developments of our time. Acquaintance with mathematics is also extremely useful for students in the social sciences, and valuable for anyone interested in the full range of human culture and the ways of knowing the universe in which we live.

The Department of Mathematics faculty has strong groups specializing in algebra, number theory, and complex analysis, Lie groups, topology and geometry, logic, probability and statistics, mathematical physics, and applied mathematics. Related departments at Cornell have specialists in computer science, operations research, linear programming, and game theory, and courses in these topics can be integrated readily into the mathematics major.

The department offers a rich variety of undergraduate courses, and many of its beginning graduate courses are suitable for advanced undergraduates as well. Under some conditions, a student may carry out an independent reading and research project for college credit, under the supervision of a faculty member.

Members of the department are available to discuss with students the appropriate course for their levels of ability and interest, and students are urged to avail themselves of this help.

Students who wish to take any of the courses numbered 300 or above are invited to confer, before registering, with the instructor concerned. The level of a course is indicated by the first digit of the course number; roughly, 1, 2, indicate 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, other.

Midterm grades, when required, will be S or U only, except in special circumstances. In all 600-level courses, final grades will be S-U only, with the exception of 690. In courses with numbers below 600, students will receive letter grades, with the exception of non-mathematics majors who have requested an S-U grade.

Advanced Placement
Secondary school students are strongly urged to take one of the advanced placement examinations of the College Entrance Examination Board in their senior year. Freshmen who have had some calculus but who have not taken an advanced placement examination should take the placement examination in mathematics offered at Cornell just before the beginning of classes in the fall. It is most important that anyone with any knowledge of calculus carefully read Advanced Placement of Freshmen in the front section of this Announcement, p. 12.

The Major
The mathematics major adapts to a number of purposes. It can emphasize the theoretical or the applied. It can be appropriate for professionals and nonprofessionals alike. It can be broad or narrow. Questions concerning the major should be brought to a departmental representative.

Prerequisites: The preferred prerequisites are Mathematics 221-222 or 293-294. A unit on infinite series is required. Such a unit is offered in Mathematics 112, 122, 192, and, in 1983-84, in 217. (Students with two semesters of advanced placement usually have had the equivalent of 217.) Normally students will be admitted to the major only when they have grades of B− or better in all sophomore-level mathematics courses they have taken. Alternative prerequisites are Mathematics 214-215-216-217-218-231, normally with grades of B+ or better.

Requirements
There are five requirements for the major:
1) Computer Science 100. Students are urged to take this course before the end of the sophomore year.
2) Two courses in algebra. Eligible courses are Mathematics 431 or 433, 432 or 434 or 332, 336.
3) Two courses in analysis. Eligible courses are Mathematics 413 or 414, 413 or 414, 421, 422, 423, 418.
4) Further high-level mathematical courses. Any one of the following is sufficient:
   a) three mathematics courses numbered 371 or higher, other than those used to satisfy the previous two requirements. Computer Science 621 and/or 622 may also be used toward satisfying this requirement.
   b) four Computer Science courses numbered 314 or higher.
   c) four Operations Research and Industrial Engineering courses numbered 320 to 383 or 431 to 472, but not 350.
5) One course dealing with mathematical models. Any one of the following is sufficient:
   a) Mathematics 305 (not offered every year).
   b) Physics 206, 213, or 217.
   c) Computer Science 211, provided no Computer Science course has been used toward satisfying the previous requirement.
   d) One course other than Physics 112 or 207 from outside mathematics with serious mathematical content and dealing with scientific matters, provided the course has not been used toward satisfying the previous requirement.

Major advisers can alter these requirements upon request of an advisee, provided the intent of the requirements is met.

Sample Major Programs
Below are some suggestions for what the schedule of a student with a mathematics major might look like. Many variations are possible.

For Graduate School in Mathematics
First two years: Mathematics 111-122-221-222
Computer Science 100, Physics 207-208.
Last two years: Mathematics 433-434, 413-414, 453-454.
Two of 418, 428, 471.
The sophomore courses Mathematics 221-222 are more suitable than 293-294 in this case. A student planning to enter graduate school may get by with 411-412 and 431-432 instead of the honors versions 413-414 and 433-434, but the honors versions are strongly recommended.

For Many Technical Careers
First two years: Mathematics 111-122-221-222 or 191-192-293-294, Computer Science 100-211, Physics 112-213 or 207-208.
Last two years: Mathematics 431-336, 421-422, 428, 471-472.
Two or more semesters of computer science are highly recommended.

For Emphasis on Computer Science
First two years: Mathematics 111—122—221—222, Computer Science 100—211.
Last two years: Mathematics 431-432, 421-422, Computer Science 314, 321, 410, 414, 481.

Requirement 5 is met by Computer Science 481 in the following elective: Computer science should give consideration to a double major in mathematics and computer science.

For Emphasis on Operations Research
First two years: Mathematics 111-122-221-222 or 191-192-293-294, Computer Science 100-211.
Last two years: Mathematics 431-432, 421-422, 471, Operations Research and Industrial Engineering 320, 321, 361; two of 431, 432, 435; and possibly 482 or 471.

For Prelaw or Premed (first example)
First two years: Mathematics 111—122—221—222, Computer Science 100, Physics 207-208.
Last two years: Mathematics 431-336, 411-421, 381, 471-472.
The sophomore courses Mathematics 221-222 are recommended rather than 293-294 in this sample program because they provide better preparation for 411.

For Prelaw or Premed (second example) or Prebusiness
First two years: Mathematics 111-122-214-215-216-218-231, Computer Science 100-211.
Last two years: Mathematics 332-336, two of 411-421-418, and also 381, 403, 451.

A course in statistics is also strongly recommended.
148 Arts and Sciences

Honors. Honors in mathematics will be awarded on the basis of a high level of performance in departmental courses. Further requirements, if any, will be announced during the year.

Distribution Requirement
The distribution requirement is satisfied in mathematics by any 6 credits, not including more than one course from Mathematics 105, 107, 403. Computer Science 100 may be used for three of these credits. The mathematics distribution requirements 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

Course Description
1) Algebra and trigonometry to prepare students for calculus
   Mathematics 106* or
   Agriculture and Life Sciences 5*
2) Algebra, analytic geometry, elements of calculus
   Agriculture and Life Sciences 115**

*Mathematics 109 and ALS 5 do not carry credit for graduation.
**Students who want a second semester of mathematics after ALS 115 may take Mathematics 107 or 105 or, if they need more calculus, 111 or 113. They may not, however, receive credit for both ALS 115 and Mathematics 108.

Calculus

Course Description
1) Standard 3-semester sequence for students who do not expect to take advanced courses in mathematics
   Mathematics 111 (or 113) - 112 - 214
2) Usual sequence for prospective mathematics majors and others who expect to take advanced courses in mathematics
   Mathematics 111 (or 113) - 122 - 221 - 222
3) Calculus for engineers (also taken by some physical science majors)
   Mathematics 191 (or 193) - 192 - 293 - 294

Mathematics 191 (or 193) may be substituted for 111 (or 113) in sequences 1 and 2. Mathematics 113 and 193 are variants of 111 and 191 for students who have had some calculus in high school but have not received advanced placement. Sequences 2 and 3 are two-year sequences that include some linear algebra.

Students who take sequence 1 may learn some linear algebra by taking Mathematics 231. A student whose performance in 112 is exceptional may switch to sequence 2 and take 221, but 217 must then be taken concurrently.

Special Purpose Sequences

Course Description
1) Finite mathematics and calculus for biology majors
   Mathematics 105 - 106
2) Finite mathematics and calculus for students in the more descriptive areas of the social sciences.
   (This is normally a terminal sequence. It does not fulfill the mathematics requirement for biology majors.)
3) Other possible finite mathematics and calculus sequences
   105 - 111 or 107 - 111
4) One semester of calculus
   108 (possible without 107)

Students who want to take both semesters of calculus are advised to take the first two semesters of one of the three calculus sequences. It is also possible to follow Mathematics 106 with 112 or 122, or, in exceptional circumstances (with consent of the instructor), with 214 - 216. Although 108 is normally a terminal course, students who do extremely well in it may take 112.

Switching between calculus sequences is often difficult, especially at the 200-level. Students should not attempt such a switch without consulting the associate chairman.

Courses with Overlapping Content

Because the department offers many courses with overlapping content, students must choose their courses carefully to ensure that they will receive credit for each course they take. Listed below are groups of courses with similar content. Students will receive credit for only one of the courses in each group.

105 and 107
108 and ALS 115 (College of Agriculture and Life Sciences)
106, 110, 111, 113, 191, 193 218 and 293
112, 122, and 219 221 and 214
112 and 217 221 and 216
192 and 217 222 and 216
214 and 293 217 and 122
216 and 192 221, 294, and 231
216 and 294 372 and 472

Basic Sequences

103 Mathematics for Architects (also Architecture 221) Fall, 3 credits
   Lec, T 10:10, plus 2 recs to be arranged. Rudiments of calculus and introduction to vectors and matrices.

105 Finite Mathematics for Biologists (also Theoretical and Applied Mechanics 105) Fall, 3 credits. Prerequisite: three years of high school mathematics, including trigonometry and logarithms. *Lecs, T R 12:20, plus 2 hours to be arranged.

106 Calculus for Biologists (also Theoretical and Applied Mechanics 106) Spring, 3 credits. Prerequisite: Mathematics 105 or 103 or ALS 115 or consent of instructor. (A strong background in mathematics is required.) Mathematics 111, rather than 106, is recommended for those planning to take 112. *Lecs, T R 11:15, plus 2 hours to be arranged. Prelims: 7:30 p.m., dates to be announced. Introduction to differential and integral calculus, partial derivatives, elementary differential equations. Examples from biology are used.

107 Finite Mathematics Fall or summer, 3 credits. Prerequisite: three years of high school mathematics, including at least two years of high school algebra. This course cannot be used toward fulfillment of the mathematics requirement for biology majors.

*See the list of courses with overlapping content at the end of the introduction.

108 Introduction to Calculus Spring, 3 credits. Intended primarily for students in the more descriptive areas of the social sciences.

109 Precalculus Mathematics Fall or summer, 3 transcript credits only; cannot be used toward graduation.

111 Calculus Fall, spring, or summer, 4 credits. Intended for students who have a good background in high school mathematics but who have not studied calculus (see Mathematics 113). Prerequisite: Mathematics 109 or three years of high school mathematics, including trigonometry. *Fall: lecs, M W F 12:20, plus 2 hours to be arranged. Spring: lecs, M W F 11:15, plus 2 hours to be arranged. Prelims: fall, 7:30 p.m., Oct. 6, Nov. 6, Dec. 1, spring, 7:30 p.m., dates to be announced.

112 Calculus Fall, spring, or summer, 4 credits. Prerequisite: Mathematics 106 or 111 or 113 with a grade of C 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 214 - 216.

113 Calculus Fall. 4 credits. Prerequisite: Mathematics 109 or three years of high school mathematics, including trigonometry. This course covers the same material as Mathematics 111, but it is intended for students who have had enough calculus to be able to differentiate polynomial functions. *Lecs, M W F 11:15 or 12:20, plus 2 hours to be arranged. Prelims: fall, 7:30 p.m., Oct. 6, Nov. 6, Dec. 1, spring, 7:30 p.m., dates to be announced.

122 Calculus Fall or spring, 4 credits. Prerequisite: performance at a high level in Mathematics 111 or 113 or permission of the department. Students planning to continue with Mathematics 214 - 216 are advised to take 112 instead of this course.* Fall: M W F 10:10, 11:15, or 12:20. Spring: M W F 9:05 or 10:10.

Diffrerentiation 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.
191–193 Calculus for Engineers Fall. 4 credits. Prerequisite: three years of high school mathematics, including trigonometry. Mathematics 193 is a course parallel to 191 for students who have had a substantial amount of calculus in high school but who did not place out of 191. Although the same topics will be covered in Mathematics 193 as in 191, some may be treated in greater depth in 193.* 191: Lecs, M W F 9:05 or 11:15, plus 2 hours to be arranged. Spring: Lecs, M W F 9:05 or 11:15, plus 2 hours to be arranged. Prelims: 7:30 p.m., Oct. 6, Nov. 3, Dec. 1. Plane analytic geometry, differential and integral calculus, and applications.

192 Calculus for Engineers Fall, spring, or summer. 4 credits. Prerequisite: Mathematics 191 or 193. Fall: Lecs. M W F 9:05 or 11:15, plus 2 hours to be arranged. Spring: Lecs. M W F 9:05 or 11:15, plus 2 hours to be arranged. Prelims: fall, 7:30 p.m., Oct. 6, Nov. 3, Dec. 1; spring, 7:30 p.m., dates to be announced. Methods of integration, polar coordinates, vectors and parametric equations, vector functions of one variable, infinite series, complex numbers, introduction to partial derivatives.

213 Calculus Summer This course covers the same material as 214–215–216–218.

214–215–216–218 Fall or spring: 1 credit each. Prerequisite: Mathematics 112 or 122. These courses are taught as paired third-semester calculus packages, but students may register for any subset of these courses in accordance with their interests and needs, subject to the credit regulations explained at the end of the introduction. Students in doubt about their choices should consult their advisers and the course instructors. The courses are offered in sequence (though not necessarily in numerical order) through the semester, and each lasts three to four weeks. The expected order is Mathematics 214 and 216 preceding 214 and 215, but some variation is possible. Note: Infinite series and complex numbers are prerequisites to Mathematics 214 and 215. Lecs. M W F 10:10, plus 2 hours to be arranged. All students should attend the first lecture of the semester to learn the order in which the course will be taught, the dates for each course, the examination dates, and the structure of the whole. Prelims will be given some evenings at 7:30 p.m.

216 Vector Analysis Vectors, vector valued functions, line integrals. See also the entire 214–215–216–218 description above.

217 Infinite Series and Complex Numbers Fall or spring. 1 credit. In 1983–84, Mathematics 217 was offered to students who took 112 before fall 1982 or who have otherwise missed infinite series. It will be taught during the first four weeks of the semester, M W F 8.

Note: 217 Infinite Series and Complex Numbers
Fall or spring. 1 credit. In 1983–84, Mathematics 217 was offered to students who took 112 before fall 1982 or who have otherwise missed infinite series. It will be taught during the first four weeks of the semester, M W F 8.

221 Linear Algebra and Calculus Fall or spring. 4 credits. Prerequisite: Mathematics 122 with a grade of B or better, or permission of instructor. Students who obtain permission to use Mathematics 117, taken before fall 1982, as prerequisite should take 217 and 221 concurrently.* Fall: M W F 9:20, 10:10, or 11:15. Spring: M W F 10:10 or 11:15. Linear algebra and differential equations. Topics include vector algebra, linear transformations, matrices, linear differential equations, as well as an introduction to proving theorems.

222 Calculus Fall or spring. 4 credits. Prerequisite: Mathematics 221. Fall: M W F 11:15 or 12:20. Spring: M W F 9:05 or 10:10 or 11:15. Vector differential calculus, calculus of functions of several variables, multiple integrals.

231 Engineering Mathematics Fall or spring. 3 credits. Prerequisites: Mathematics 192 or 194, 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 W F 10:10, 11:15, or 12:20, plus one hour to be arranged. Spring: Lecs. M W F 9:05 or 12:20, plus one hour to be arranged. Prelims: fall, 7:30 p.m., Sept. 29, Nov. 3, Dec. 1; spring, 7:30 p.m., dates to be announced. Partial derivatives, multiple integrals, first- and second-order ordinary differential equations with applications in the physical and engineering sciences.

245 Numerical Solutions of Differential Equations Spring. 4 credits. Prerequisites: Mathematics 222 or 294, 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. M W F 11:15. Methods and basic theory for the numerical solution of ordinary and partial differential equations. Linear multistep methods, Runge-Kutta methods, and the problem of stiffness for ordinary differential equations. Finite difference methods and Galerkin finite element methods for partial differential equations. Homework will involve use of a computer.

425 Introduction to Ordinary Differential Equations Fall. 4 credits. Prerequisite: Mathematics 222 or 294, or permission of instructor. Not offered 1983–84. T R 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 theory, transform methods, approximation methods, and application to physical problems.

428 Introduction to Partial Differential Equations Spring. 4 credits. Prerequisite: Mathematics 222 or 294 or permission of instructor. T R 10:10–11:25. Topics selected from: first-order quasilinear equations, classification of second-order equations, with emphasis on maximum principles, existence, uniqueness, stability, Fourier series methods, approximation methods.

Analysis

411–412 Introduction to Analysis 411, fall; 412, spring. 4 credits each term. Prerequisite: Mathematics 222. Students who 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. T R 8:40–9:55. An introduction to the theory of functions of real variables, stressing rigorous logical development of the subject rather than 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  413, fall; 414, spring. 4 credits each. Prerequisite: Mathematics 222.
  T R 10:10–11:25.
Honors version of Mathematics 411–412. Metric spaces 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 214–218.
May be offered only in alternate years.
  T R 12:40–2:40.
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.
  M W F 10:10.
Vectors, matrices, and linear transformations, affine and Euclidean spaces, transformation of matrices, and eigenvalues.

332 Algebra and Number Theory  Fall only. 4 credits.
Prerequisite: one year of calculus and one course from Mathematics 221, 231, and 294.
Mathematics 332 does not satisfy prerequisites for courses numbered 500 and above.
  M W F 9:05.
Various topics from modern algebra and number theory, usually including rings, fields, and finite groups. Motivation and examples are derived mostly from geometry, arithmetic, and congruence problems on the integers.

338 Applicable Algebra  Spring, 4 credits.
Prerequisites: Mathematics 221, or 294, or 231.
  M W F 9:05.
An introduction to concepts and methods of abstract algebra that are of importance in science and engineering. Applications of the theory to concrete problems will be stressed. Each year the course will treat aspects of the following topics: partially ordered sets, lattices, graph theory, and Boolean algebras; finite machines and languages; applications of group theory 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  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.
  M W F 10:10.
431: An introduction to linear algebra, including the study of vector spaces, linear transformations, matrices, and systems of linear equations; quadratic forms and inner product spaces; canonical forms for various classes of matrices and linear transformations; determinants. 432: an introduction to various topics in abstract algebra, including groups, rings, fields, factorization of polynomials and integers, congruences, and the structure of finitely generated modules over Euclidean domains with application to canonical forms of matrices.

433–434 Introduction to Algebra  433, fall; 434, spring. 4 credits each.
Prerequisite: Mathematics 221 or 231.
  M W F 10:10.
Honors version of Mathematics 431–432. Mathematics 433–434 will be more theoretical and rigorous than 431–432 and will include additional material such as multilinear and exterior algebra.

*See the list of courses with overlapping content at the end of the introduction.

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.
  M W F 11:15.
Foundations of geometry. Various geometric topics, including Euclidean, non-Euclidean, and projective geometry and rigidity theory.

453 Introduction to Topology  Fall. 4 credits.
Prerequisites: Mathematics 211 and 221, or permission of instructor.
  M W F 12:20.
Basic point set topology, connectedness, compactness, metric spaces, fundamental group. Application of these concepts to surfaces such as the torus, the Klein bottle, the Moebius band.

454 Introduction to Differential Geometry  Spring. 4 credits.
Prerequisite: Mathematics 222 or 294.
Mathematics 454 is not a prerequisite.
  M W F 12:20.
Differential geometry of curves and surfaces. Curvature, geodesics, differential forms. Introduction to n-dimensional Riemannian manifolds. This material provides some background for the study of general relativity; connections with the latter may be indicated.

Probability and Statistics

372 Elementary Statistics  Fall. 4 credits.
Prerequisites: one year of calculus; also Computer Science 100, or 101, or 108, or permission of instructor. A terminal course for students who will take no further courses in statistics.
  M W F 9:05.
Evening prelims may be given. Introduction to the fundamental laws of probability and statistics. These topics are essential to an understanding of the subject. Homework involves the solution of problems involving the use of statistical packages.

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.
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 221 and knowledge of linear algebra such as taught in Mathematics 222.
  M W F 11:15.
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.

Mathematical Logic

381 Elementary Mathematical Logic  Spring. 4 credits.
Prerequisite: Mathematics 122.
  M W F 11:15.
Propositional and predicate logic. Completeness and incompleteness theorems. Set theory.

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  Spring. 4 credits.
Prerequisites: Mathematics 511 and 531. Intended for graduate students in the mathematical sciences. May not be offered 1983–84. This course will be devoted to the history of mathematics in the nineteenth century from the original sources, with emphasis on the history of the foundations of analysis and of the foundations of commutative algebra. Typical authors in algebra who will be studied are Lagrange, Ruffini, Gauss, Abel, Galois, Dirichlet, Kummer, Kronecker, Dedekind, Weber, M. Noether, Hilbert, Steinitz, Artin, and E. Noether. Typical authors in analysis who will be studied are Cauchy, Fourier, Bolzano, Dirichlet, Riemann, Weierstrass, Heine, Cantor, Peano, and Hilbert. If time permits, a sketch will be given of the history of probability and statistics from Bernoulli to Pearson. Students will be required to read and explain one important nineteenth-century paper.

511–512 Real and Complex Analysis  511, fall; 512, spring. 511: measure and integration, functional analysis. 512: complex analysis, Fourier analysis, and distribution theory.

513–514 Topics in Analysis

515–516 Mathematical Methods in Physics  515, fall; 516, spring. 4 credits each. Intended for graduate students in physics or related fields who have had a strong advanced calculus course and at least two years of general physics. A knowledge of the principal mathematical methods used in advanced physics. A brief discussion of some basic notions: metric space, vector space, linearity, continuity, integration. Generalized functions (Schwartz distributions), Fourier series and Fourier integrals, saddle point method. Linear operators. Differential operators and integral operators, the equations and eigenvalue problems connected with them and the special functions arising from them. Elements of group theory. The rotation group and its representations.


521 Measure Theory and Lebesgue Integration  Fall.
Measure theory, integration, and L∞ spaces.

522 Applied Functional Analysis  Spring.
Spectral theorem for bounded operators, spectral theory for unbounded operators in Hilbert space, compact operators, distributions, applications.
531–532 Algebra Fall, Spring. 531: Finite groups, field extensions, Galois theory, rings and algebras, tensor and exterior algebra. 532: Wedderburn structure theorem. Brauer group, group cohomology, Dedekind domains, primary decomposition, Hilbert basis theorem, local rings.

537 Elementary Number Theory Fall. Prerequisite: Mathematics 432 and 412. Introduction to number theory suitable for first-year graduate students and advanced undergraduates. Choice of topics discussed depends on the instructor. In previous years the text has been A Course in Analytic, by J. P. Serre; the topics covered have included quadratic forms, quadratic reciprocity, and modular forms.


552 Differentiable Manifolds Fall. Prerequisites: advanced calculus and some elementary point-set topology (e.g., knowledge of the concepts of continuity, compactness, and connectedness). This course will be an introduction to differential topology, intended for undergraduate seniors and beginning graduate students. The first part of the course will emphasize examples and constructions of manifolds. Topics will include 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. Topics include the probability measures, random variables, and distribution functions. Expectation and moments: independence, Borel-Cantelli lemmas, zero-one laws. Convergence of random variables, probability measures, and characteristic functions. Law of large numbers. Topics include limit theorems for sums of independent random variables. Markov chains, recurrent events. Ergodic and renewal theorems. Martingale theory. Brownian motion and processes with independent increments.

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. Topics include probability theory of point estimation, consistency, efficiency, sufficiency, and the method of maximum likelihood; the classical tests of hypotheses and the theory of critical values; 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 1983–84.

577 Nonparametric Statistics Prerequisite: a course in mathematical statistics such as Mathematics 574. Not offered 1983–84. 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.

591–512 Seminar in Analysis 611 may not be offered 1983–84.

613 Functional Analysis Fall. Topological vector spaces. Banach and Hilbert spaces. Additional topics to be selected by instructor.

615 Fourier Analysis Not offered 1983–84.

627 Seminar in Partial Differential Equations Fall.

631–632 Seminar in Algebra Fall.

635 Topics in Algebra I Fall. Selection of advanced topics from algebra, algebraic number theory, and algebraic geometry. Course content varies.

637 Algebraic Number Theory Not offered 1983–84.

639 Topics in Algebra II Not offered 1983–84. Selection of advanced topics from algebra, algebraic number theory, and algebraic geometry. Course content varies.

640 Homological Algebra Fall.

651–652 Seminar in Topology Fall.

653–654 Algebraic Topology Fall. Dyadicity in manifolds, applications, cohomology operations, spectral sequences, homotopy theory, general cohomology theories, categories and functors.

657–658 Advanced Topology Selection of advanced topics from modern algebraic, differential, and geometric topology. Course content varies.

661–662 Seminar in Geometry May not be offered 1983–84.

667 Algebraic Geometry Not offered 1983–84.

670 Topics in Statistics Not offered 1983–84. 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 1983–84.

675–676 Statistical Decision Theory

677–678 Stochastic Processes 677, Fall; 678, not offered 1983–84.

681–682 Seminar in Logic

683 Model Theory


685 Metamathematics Not offered 1983–84. Topics in metamathematics. Course content varies.


688 Automatic Theorem Proving Fall. Prerequisites: Math 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) the 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 according to content of possibly useful prior results; (5) heuristic systems, which discover proofs through educated guesses (e.g., which variable one should induct on to prove the associativity of addition); (6) artificial intelligence systems, which aim to simulate the evolution of mathematics by automatically generating new concepts, generalizations, conjectures from existing theorems.

690 Supervised Reading and Research

Modern Languages and Linguistics


The Department of Modern Languages and Linguistics offers courses in linguistics (the study of the structure of language) and elementary, intermediate, and advanced courses in the minor as well as the major languages of Europe and south, southeast, and east Asia. Students take these courses because they are interested in the area in which the language is spoken. See Modern Languages, Literatures, and Linguistics, below.

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 Linguistics (see Linguistics, pp. 161–163). Literature courses, and certain language courses as well, are taught by the following departments:

Modern Languages, Literatures, and Linguistics
Arabic
See listings under Near Eastern Studies.

Burmese

101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Burmese 102: Burmese 101 or equivalent. Hours to be arranged. R. B. Jones. A semi-intensive course for beginners or for those who have been placed in the course by examination. The purpose of the course is to give a thorough grounding in all the language skills: listening, speaking, reading, and writing.

201–202 Burmese Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Burmese 201, qualification in Burmese; for Burmese 202, Burmese 201. Hours to be arranged. R. B. Jones.

203–204 Composition and Conversation 203, fall; 204, spring. 3 credits each term. Prerequisites: for Burmese 203, qualification in Burmese; for Burmese 204, Burmese 203. Hours to be arranged. R. B. Jones.

301–302 Advanced Burmese Reading 301, fall; 302, spring. 4 credits each term. Prerequisites: for Burmese 301, Burmese 202 or permission of instructor. Hours to be arranged. R. B. Jones. Selected Burmese readings in various fields.

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. 6:45 to be arranged. F. E. Huffman.

201–202 Cambodian Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Cambodian 201, qualification in Cambodian; for Cambodian 202, Cambodian 201. Hours to be arranged. F. E. Huffman.

203–204 Composition and Conversation 203, fall; 204, spring. 3 credits each term. Prerequisites: for Cambodian 203, qualification in Cambodian; for Cambodian 204, Cambodian 203. Hours to be arranged. F. E. Huffman.

301–302 Advanced Cambodian 301, fall; 302, spring. 4 credits each term. Prerequisites: for Cambodian 203, qualification in Cambodian; for Cambodian 204, Cambodian 203. Hours to be arranged. F. E. Huffman.

401–402 Directed Individual Study 401, fall; 402, spring. For advanced students. 4 credits each term. Prerequisite: permission of instructor. Hours to be arranged. F. E. Huffman.

404 Structure of Cambodian Spring. 4 credits. Prerequisite: Linguistics 101–102 or equivalent. Hours to be arranged. F. E. Huffman.

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. Not offered 1983–84. Hours to be arranged. J. U. Wolff. A semi-intensive course for beginners.]

Chinese

Language and Linguistics

101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Chinese 102: Chinese 101 or equivalent. Lect., M W F 9:05; drill, M–F 8 or 2:30. J. McCoy, P. Wang, and staff. A semi-intensive course for beginners or for those who have been placed in the course by examination. The course gives a thorough grounding in all the language skills: listening, speaking, reading, and writing.

111–112 Cantonese Elementary Speaking 111, fall; 112, spring. 3 credits each term. Prerequisites: for Chinese 111, permission of instructor; for Chinese 112, Chinese 111. Both Chinese 112 and 114 or equivalents are necessary to fulfill any language requirements. Lect., T 11:15; drills. M W F 10:10. S. Fessler, J. McCoy. Conversation in standard Cantonese as spoken in Hong Kong and Canton.

113–114 Cantonese Elementary Readings 113, fall; 114, spring. 3 credits each term. Prerequisite: Chinese 113 or Chinese 114 or equivalents necessary to fulfill any language requirements. Lect., R 11:15; drills. T R 10:10. S. Fessler, J. McCoy. Readings in Modern expository prose with Cantonese pronunciation.


211–212 Intermediate Cantonese I 211, fall; 212, spring. 4 credits each term. Prerequisite: qualification in Chinese. M–F 9:05 or 11:15. P. Wang and staff.

213–214 Introduction to Classical Chinese 213, fall; 214, spring. 3 credits each term. Prerequisite: qualification in Chinese or permission of instructor. May be taken concurrently with Chinese 101–102, 201–202, 301–302. 213: M W F 11:15, plus 1 hour to be arranged. 214: hours to be arranged. Staff.


311–312 Intermediate Cantonese II 311, fall; 312, spring. 4 credits each term. Prerequisite: Cantonese 212 or permission of instructor. Hours to be arranged. S. Fessler.

315–316 Chinese Composition 315, fall; 316, spring. 4 credits each term. Prerequisite: Chinese 202 or 212. M W F 10:00. P. Ni. Special emphasis on developing the style and vocabulary of modern written Chinese through practice and example.

401 History of the Chinese Language Fall or spring, according to demand. 4 credits. Prerequisite permission of instructor. Not offered 1983–84. Hours to be arranged. J. McCoy. Survey of phonological and syntactic developments in Chinese.

403 Linguistic Structure of Chinese: Phonology and Morphology Fall or spring, according to demand. 4 credits. Prerequisite: permission of instructor. Offered alternate years. Hours to be arranged. J. McCoy. Introductory course in the phonology of modern Mandarin Chinese.

404 Linguistic Structure of Chinese: Syntax Fall or spring, according to demand. 4 credits. Prerequisite: permission of instructor. Offered alternate years. J. McCoy. Syntax of modern Mandarin Chinese.

405 Chinese Dialects Fall or spring, according to student demand. 4 credits. Prerequisite: permission of instructor. Not offered 1983–84. Hours to be arranged. J. McCoy. Introductory survey of modern dialects and their distinguishing characteristics.

411–412 Readings in Modern Chinese Literature 411, fall; 412, spring. 4 credits each term. Prerequisite: Chinese 302. M W F 1:25. P. Ni.

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. J. McCoy. 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. J. McCoy and staff. Foreign Language Requirement: Proficiency is attained by passing 161.

Literature

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 T'ung and Sung Poetry Fall or spring on demand. 4 credits. Prerequisite: permission of instructor. T. L. Mei.
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 additional 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 101–102). These courses will include at least one course in French and one course in the structure of French.

2) The successful completion of two courses (preferably a sequence) in one of the following: (a) French literature and civilization, (b) psycholinguistics, (c) philosophy of language, (d) anthropological linguistics.

Whatever option a student chooses, he or she is urged to take advantage of the ample flexibility offered by the French major. Students who wish to pursue careers in business, law, medicine, or teaching may coordinate their work with preprofessional programs. Similarly, interdisciplinary work is strongly encouraged. Students may elect to enrich their major with related courses in history, 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 involving three terms, provides a unique learning opportunity, since it allows for wide reading, careful outlining, and extensive rewriting to a degree not practically possible in the case of course papers. At each stage of their work, the students will have regular weekly meetings with faculty tutors.

No special seminars or courses are required of honors students. The junior honors 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. 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 Morris for details no later than the spring term of the sophomore year, and earlier if possible. Honors work in French linguistics will be supervised by Professor Waugh.

Fees. Depending on the course, a small fee may be charged for copies of texts for course work.

Language and Linguistics

121–122 Elementary Course 121, fall; 122, spring. 4 credits each term. Intended for beginners or students placed by examination. Prerequisite for French 123; French 121 or equivalent. Students who obtain a CPT score of 560 after French 121–122 may attempt a special examination to be taken no later than the end of the sophomore year. A typical program 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. 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 Morris for details no later than the spring term of the sophomore year, and earlier if possible. Honors work in French linguistics will be supervised by Professor Waugh.

Fees. Depending on the course, a small fee may be charged for copies of texts for course work.

Language and Linguistics

121–122 Elementary Course 121, fall; 122, spring. 4 credits each term. Intended for beginners or students placed by examination. Prerequisite for French 123; French 121 or equivalent. Students who obtain a CPT score of 560 after French 121–122 may attempt a special examination to be taken no later than the end of the sophomore year. A typical program 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. 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 Morris for details no later than the spring term of the sophomore year, and earlier if possible. Honors work in French linguistics will be supervised by Professor Waugh.

Fees. Depending on the course, a small fee may be charged for copies of texts for course work.

Language and Linguistics
123 Continuing French Fall or spring, 4 credits. Limited to students who have previously studied French. Prerequisite: qualification in French with a CPT score no higher than 629. Offered by the Department of Romance Studies.


Designed to provide an introduction to contemporary French culture and literature. Texts read and discussed are selected for their cultural and humanistic value. One-third of class time is devoted to reading, writing, and conversation. Emphasis will be placed on study of grammar, more on the examination of texts and on questions of style. 200 Intermediate Course: Language and Literature Fall or spring, 3 credits. Prerequisite: qualification in French with a CPT score no higher than 629. Offered by the Department of Romance Studies.


This course is based on an audio-visual materials used in class; slides and recordings will accompany extensive discussions. A modest amount of reading each week will aim at increasing students' vocabulary. 311 Advanced Composition and Conversation Fall, 4 credits. Prerequisite: French 204 or 212 or placement by the CASE test. Offered by the Department of Romance Studies.

M W F 9:05, 12:20, or 1:25. J. Béreaud and staff. All-skills course. Detailed study of present-day syntax. Reading and discussion of texts of cultural relevance. 312 Advanced Composition and Conversation Spring, 4 credits. Prerequisite: French 311 or placement by the CASE test. M W F 10:10 or 1:25. E. Morris and staff.

Continuation of work done in French 311. Less emphasis will be placed on study of grammar, more on the examination of texts and on questions of style. 401 History of the French Language Fall, 4 credits. Prerequisites: qualification in French and Linguistics 101, or permission of instructor. Offered alternate years. M W F 2:30. J. S. Noblitt.

Diachronic development of French from Latin, with emphasis on phonological and morphological changes. Course work includes problems in reconstruction, textual analyses, discussions of theoretical topics, and external history. 407 Applied Linguistics: French Fall, 4 credits. Prerequisite: qualification in French. M W F 10:10. J. S. Noblitt.

Designed to equip the student with the ability to apply linguistic descriptions in teaching French, with special emphasis on phonetics and morphology. 408 Linguistic Structure of French Spring, 4 credits. Prerequisite: qualification in French and Linguistics 101, or permission of instructor. Offered alternate years. M W F 2:30. Staff.

A descriptive analysis of modern French, with emphasis on its phonology, morphology, syntax, and semantics. 410 Semantic Structure of French Fall or spring. 4 credits. Prerequisite: permission of instructor. Offered alternate years. Not offered 1983–84; next offered 1984–85. Hours to be arranged. L. R. Waugh.

Intrior to the structures of a language—morphological, lexical and syntactic—from a Jakobsonian and functional perspective.) 424 Composition and Style Spring. Not offered 1983–84.)

602 Linguistic Structure of Old and Middle French Spring. 4 credits. Prerequisite: French 408 or permission of instructor. Offered alternate years. Hours to be arranged. J. S. Noblitt.

Through the study of Old and Middle French texts, students analyze synchronically aspects of the grammar of the language at different periods. 604 Contemporary Theories of French Grammar Fall, 4 credits. Prerequisite: permission of instructor. Not offered 1983–84. Hours to be arranged. Staff.

Selected readings of twentieth-century French linguistics.) 700 Seminar in French Linguistics Fall or spring, according to demand. 4 credits. Hours to be arranged. Staff.

Seminors are offered according to faculty interest and student demand. Topics in recent years have included current theories in French phonology; current theories in French syntax; semantics of French.

Literature

[107 Freshman Seminar: Readings in Modern Literature Not offered 1983–84.]

109 Freshman Seminar: Techniques of Interpretation: An Introduction to Semiotics (also Romanic Studies 109) Fall and spring. 3 credits. T R 8:40—9:55, K. Lockhart.

In its broadest meaning semiotics is the study of signs that carry information: roadside signs, fashions, advertisements, publicity posters, literary modes. This course, which does not presuppose prior technical knowledge, will introduce the students to a critical reading of signs: the signer (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 T.V. or from cultural phenomena (fashion codes, artistic modes).

201 Introduction to French Literature Fall or spring, 3 credits. Prerequisite: qualification. 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 (M W F 9:05, 10:10, or T R 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.


The work of five or six major French authors from the nineteenth and twentieth centuries is introduced (novels, plays, poems). Stress is on the development of reading skills and, more generally, on cultural, sociological, and aesthetic implications of the texts. Reading will include works of such authors as Balzac, Flaubert, Sartre, Camus; and Beckett.

202 Studies in French Literature Fall or spring. 3 credits. Prerequisite: French 201 or a CPT achievement score of 650 or more (students who have not taken French 201 should obtain consent of instructor). Those with scores in the 560—649 range should see the description of French 201). Three sections are offered, with the required texts for each of the three sections being the same. Required of all majors, but not limited to them. A fee is charged for a number of short texts distributed by the instructor.


Study of the classic literature of seventeenth-century France (Corneille, Racine, Moliere, Madame de Lafayette) and its immediate forebears (Montaigne) and successors in the Enlightenment (Voltaire, Rousseau, Diderot, Beaumarchais).


Two of the leading postwar French philosophers, Jean-Paul Sartre and Jacques Derrida, have devoted an important part of their work to the study of an author whose plays, autobiographical fictions, and critical essays seem very removed from abstract, theoretical concerns. This course will focus primarily on reading closely the works of Genet but will include regular discussions of excerpts from Sartre’s Saint Genet and Derrida’s Glas.


[358] French Writings from 1515 to 1562  Fall. 4 credits. Prerequisite: French 202 or permission of instructor. Lectures in French; class discussions in French and English. Papers may be written in French or English.


[360] Camus and His Contemporaries  Fall. 4 credits. Not offered 1983–84. S. Tarrow.


[395] Mystical and His Contemporaries  Fall. 4 credits.

[396] The Aesthetics of Coincidence (also Comparative Literature 498)  Fall. 4 credits. Prerequisite: for those taking it in French, French 201 or equivalent. Taught in English.

[409] Special Topics in French Literature 4 credits each term. Prerequisite: permission of instructor. Staff. Guided independent study.

[410] Honors Work in French 4 credits each term, with permission of the advisor. Open to juniors and seniors. Consult the director of the honors program, E. Morris.

[447] Medieval Literature 447, fall; 448, spring. 4 credits each term. Prerequisite: French 201 or permission of instructor. First term not prerequisite to the second.

[448] French Literature 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 is the primary goal of this course.


[483] Feminism and French Literature (also Women’s Studies 483) Not offered 1983–84.


[493] French Feminisms (also Women’s Studies 493) Spring. 4 credits. Taught in English.


[561] A Dozen Molieres Plays and Some Lingering Dramatic Problems (also Comparative Literature 561) Fall. 4 credits. Prerequisite: if counted as French (readings in French), at least one French course at 300 level. Taught in English.


[564] Modern Languages, Literatures, and Linguistics 155


[565] French Feminisms (also Women’s Studies 493) Spring. 4 credits. Taught in English.


[572] Special Topics in French Literature 639, fall; 640, spring. 4 credits each term. Staff. Guided independent study for graduate students.


[576] Medieval Seminar: La Roman de la Rose  Spring. 4 credits.

[666 Seventeenth-Century Seminar: Morailities in Fiction: The Classical Moment (also Comparative Literature 566) Not offered 1983–84 ]
[667 Seventeenth-Century Seminar: Illusion and Representation Not offered 1983–84 ]
P. Lewis.]

[683 Lacan (also Comparative Literature 607) Not offered 1983–84.]

689 Gerard de Nerval Spring 4 credits. W 2:30–4:25 E. Morris. Admired by contemporaries like Gautier and Baudelaire, the works of Nerval dropped into general oblivion after the writer's death in 1855, only to resurface in the 1960's (indeed Lacousted), after the Second World War. The course will attempt to account for those happenings and to reread Nerval's writings in the light of recent reinterpretations of romanticism (Beguin, De Man), madness (Foucault), the autobiographical project (Lejeune, Beaujour, E. Burt), and the work of Freud (Schur, Derrida).

[689 Bohemians and Dandies Not offered 1983–84.]

[694 Six Critics In Search of an Author: Sartre, Criticism, Critics (also Comparative Literature 604) Not offered 1983–84.]


Related Courses in Other Departments

The European Novel (Comparative Literature 363–364)
Grammar in the Middle Ages (Society for the Humanities 420)
The Rhetoric of Renaissance Humanism (Society for the Humanities 421–422)
Feminist Theory: Franco-American Currents (Society for the Humanities 419)
Petrarch, Ronsard, and Donne (Comparative Literature 658)
Baudelaire and Hugo (Comparative Literature 671)
The Language(s) of Politics in the Renaissance (Society for the Humanities 425–426)

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 a 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 department(s) and programs such as Comparative Literature, History, History of Art, Government, Music, 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. 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, theatre arts, or other suitable subjects. These students will select a committee of two or more faculty members to help them design a program which will supervise their progress. One committee member must be from the German faculty of either the Department of Modern Languages and Linguistics or the Department of German Literature. The other member(s) should represent the student's main area of interest.

The student majoring in German area studies is expected to become competent in the German language. Such competence is normally demonstrated by successful completion of German 304. A minimum of six area courses above the 200 level is required for the major. Students coming to Cornell with advanced standing in German and/or another subject often find it possible to complete two majors. Recent double majors have combined history and German, psychology and German, chemistry and German, and biology and German.

Honor. The honors program in German is open to superior students who wish to work independently in an area of their own choice. Students are free to select any faculty member of the Field of Germanic Studies (in the case of area studies majors, the appropriate member of their committee) to assist them in designing their honors program, to supervise their work, and to help them select a suitable topic for an honors essay. The independent study courses, German 451 and 452, may form part of the program.

Freshman Seminar Requirement

The following courses will satisfy the Freshman Seminar requirement. German 109, 151, 211, and 312. For details students should consult the instructors.

Fees. Depending on the course, a small fee may be charges for photocopied texts for course work.

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 560 after German 121–122 attain qualification and may enter the 200-level sequence; otherwise German 123 is required for qualification. (Lec. T 9:05, 11:15, or 125, drills, M W R F B, 9:05, 10:10, 11:15, 12:20, 1:25, or 2:30. H. L. Kufer. A thorough grounding in all the language skills is given: listening, speaking, reading, and writing. Language practice in small groups. Lectures cover grammar, reading, and cultural information.)

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.


203 Intermediate Composition and Conversation Fall or spring. 3 credits. Prerequisite: qualification in German.


204 Intermediate Composition and Conversation Fall or spring. 3 credits. Prerequisite: German 203 or permission of instructor.

Fall: M W F 11:15. Spring: M W F 10:10 or 11:15. Staff.

303–304 Advanced Composition and Conversation 303, fall; 304, spring. 4 credits each term. Prerequisite for German 303. German 204 or equivalent. Prerequisite for German 303. German 303 or equivalent.

M W F 11:15 or 1:25. Staff. Emphasis is on increasing the student's oral and written command of German. Detailed study of present-day syntax and different levels of style.

306 Zeitungsaufsetzaufsetzen Spring. 4 credits. Prerequisite: German 304 or equivalent. M W F 11:15. E. Augsberger.

[401 Introduction to Germanic Linguistics Fall. 4 credits. Prerequisite: Linguistics 101 or permission of instructor. Not offered 1983–84. Hours to be arranged. W. E. Harbert. Survey of major issues in Germanic linguistics, with emphasis on historical and dialectal problems.]

[402 History of the German Language Spring. 4 credits. Prerequisite: German 204 and Linguistics 101 or permission of instructor. Offered alternate years. Not offered 1983–84. Hours to be arranged. F. van Coetsen. Phonological, syntactic, and semantic developments from pre-Old High German times to the present.]

[403 Modern German Phonology Fall. 4 credits. Prerequisites: German 304 or equivalent, and Linguistics 101, 111, or 301. Not offered 1983–84. Hours to be arranged. F. van Coetsen. The phonological system of German is viewed from various theoretical approaches.]

[404 Modern German Syntax Spring. 4 credits. Prerequisites: German 304 or equivalent, and Linguistics 101 or 303. Hours to be arranged. W. E. Harbert. An application of selected theoretical syntactic models to problems in the syntax of modern German.]

[405 German Dialectology Fall. 4 credits. Prerequisite: German 304 or equivalent, and Linguistics 101 or equivalent. Not offered 1983–84. H. L. Kufner. Survey of German dialects, the work done at the Sprachkabinett, and a discussion of modern approaches to dialectology.]
406 Runology Fall. 4 credits. Prerequisite: German 401. Not offered 1983–84. 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. Prerequisite: German 204 and Linguistics 101–102, or permission of instructor. Not offered 1983–84. Hours to be arranged. 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 1983–84. Hours to be arranged. W. E. Harbert. A descriptive analysis of present-day German, with emphasis on phonology and syntax.

602 Gothic Spring. 4 credits. Prerequisite: Linguistics 101. Not offered 1983–84. Hours to be arranged. F. van Coetsem. Linguistic structure of Gothic, with extensive readings of Gothic texts.

604 Old Low Franconian, Old Frisian Fall. 4 credits. Prerequisite: Linguistics 102. Offered in alternate years. Not offered 1983–84. Hours to be arranged. F. van Coetsem.

605 Structure of Old English Fall. 4 credits. Prerequisite: German 401. Not offered 1983–84. 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 1983–84. Hours to be arranged. J. Jasanoﬀ. The Germanic verbal system and its Indo-European origins.

607 Topics in Historical Germanic Morphology Spring. 4 credits. Prerequisite: German 401. Not offered 1983–84. Hours to be arranged. J. Jasanoﬀ. A diachronic and comparative investigation of syntactic processes in the older Germanic languages.

609–610 Old Norse 609, fall. 610, spring. 4 credits each term. Hours to be arranged. V. Bjørn. 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 1983–84. 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 (Oftrid, Talian, Heland) as well as representative shorter works such as Hildebrandslied, Muspil, and Genesis.

612 Germanic Tribal History Spring. 4 credits. Prerequisite: German 401. Not offered 1983–84. 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 branches.

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.

M W F 4:30 or T R 1:25–4:20. I. Kovary. 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. Not offered 1983–84. Hours to be arranged. W. E. Harbert.

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 1983–84. Hours to be arranged. Staff. Topics include phonology, morphology, syntax, and dialectology of the older Germanic languages.

730 Seminar in German Linguistics Fall or spring, subject to the needs of students and to the limitations of staff time. 4 credits. Not offered 1983–84. Hours to be arranged. Staff. Selected topics including the history, structure, and dialects of German.

740 Seminar in Dutch Linguistics Spring, subject to the needs of students and to the limitations of staff time. 4 credits. Not offered 1983–84. 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. M W F 8 or T R 8:40–9:55. I. Ezeriga 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, Hesse, Brecht, and Mann 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, Siddhartha, Death in Venice, The Metamorphosis, Mother Courage, Galileo, and others), the emphasis of the course will be on improving writing skills. We will meet twice a week for lectures and discussion. In lieu of a third class meeting there will be regular conferences between students and their instructors to discuss the papers.

Courses Offered in German

201 Introduction to German Literature I Fall and spring. 3 or 4 credits each term. Prerequisite: qualification in German or permission of instructor. Taught in German. Fulfills both the language qualification, tools of literary analysis, and expansion of vocabulary. Grammar review included. Readings from major twentieth-century authors, including Brecht, Duerrenmatt, Frisch, Aichinger, Bachmann, Musil, and Kafka.

202 Introduction to German Literature II Fall and spring. 3 or 4 credits each term. Prerequisite: German 201 or permission of instructor. Taught in German. Fall: M W F 1:25. Spring: M W F 12:20 or T R 12:20–1:35. P. W. Nutting and staff. An intermediate course emphasizing skills in reading and interpreting German literature, using representative texts of major nineteenth-century authors. Included will be discussions of the drama (Kleist, Buechner), lyric poetry (Goethe, Heiderlin, the Romantics, Heine), the essay (Kleist, Heine, Marx), and the novella (Kleist, Buechner, Keller, Moerike).

211 Intensive Workshop in Germanic Studies for Freshmen I Fall. 6 credits. Intended for entering freshmen with extensive training in the German language (CPT achievement score of 650 or comparable evidence; please consult instructor). Taught in German. Satisfies the language and distribution requirements or the Freshman Seminar requirement. T R 2:30–4:30. H. Deinert.

212 Intensive Workshop in Germanic Studies for Freshmen II Fall and spring. 6 credits. Taught in German. T R 10:10–11:25. P. W. Nutting. Introduction to the history of postwar Germany, the development of the two Germanies, and their societies. The emphasis is on cultural and social institutions such as mass media, educational systems, and political parties. Students will have the opportunity to practice their spoken and written German.

305 Modern Germany Fall. 4 credits. Prerequisite: German 202 or equivalent. Taught in German. T R 10:10–11:25. P. W. Nutting. Taught in German. Satisfies the language and distribution requirements or the Freshman Seminar requirement. T R 2:30–4:30. H. Deinert. Designed primarily as a sequel to German 211. Emphasis is on German literature since 1900 (T. Mann, Hesse, Kafka, Brecht, Duerrenmatt, Peter Weiss, Plenzdorf, Rilke, Benn, Celan). Supplementary reading from contemporary philosophy, psychology, sociology, and political theory.

354 Schiller Fall. 4 credits. Prerequisite: German 201, 202 or permission of instructor. Taught in German. W 2:30–4:30. H. Deinert. A discussion of Schiller's dramas, selected poetry, and philosophical and aesthetic writings against the political and intellectual background of eighteenth-century Europe.


357 Heinrich von Kleist Not offered 1983–84.

359 Fin de Siecle Vienna Spring. 4 credits. Prerequisite: German 201, 202, or permission of instructor. Taught in German. T R 12:20–1:35. S. L. Gilman. At the close of the last century, artists, intellectuals, and literati in Austria were aware that they stood at the end of one age and at the beginning of another. The Vienna fin de siecle is the resulting decade-long revolt against tradition and search to define the modern. This course will focus on short works of Kraus, Hoffmannthal, Freud, Schnitzler. Lectures in German on the intellectual background of the period.
An exploration of the relationship between Naturalism and the "woman question" as it was posed and approached in Naturalist and feminist literature at the end of the nineteenth century. We will consider representations of gender and sexuality in well-known Naturalist works, the role and writings of women within Naturalist circles, and the analyses of women's positions in Wilhelminian society by some of the leading feminists of the period. Readings will include but not be limited to Ibsen's Nora, Holz/Schloss, Die Familie Selcke, Hauptmann's Emsame Menschen, Vor Sonnenaufgang, Die Weber, Gabriele Reuter's Das Tränensal, and selected poems and short essays of Lou Andreas-Salome, Laura Marholm, Gertrud Baumer, Helene Stocker, Marie von Ebner-Eschenbach, and others.

Familie Selicke; and the "woman question" as it was posed and approached in Naturalist and feminist literature at the end of the nineteenth century. Taught in German.

Das Tranenhaus, Kafka and Prague: Bohemia in the early twentieth century. We will consider close reading and discussion of Kafka's journals, Naturalist works, the role and writings of women in Wilhelminian society by some of the leading feminists of the period. Readings will include but not be limited to Ibsen's Nora, Holz/Schloss, Die Familie Selcke, Hauptmann's Emsame Menschen, Vor Sonnenaufgang, Die Weber, Gabriele Reuter's Das Tränensal, and selected poems and short essays of Lou Andreas-Salome, Laura Marholm, Gertrud Baumer, Helene Stocker, Marie von Ebner-Eschenbach, and others.

Kafka and Prague: Bohemia in the early twentieth century. Taught in German.

An overall survey of the moods, modes, and forms of the German Novel in the period of its rise to prominence. Prerequisite: good reading knowledge of German. Open to undergraduate and graduate students. No final examination or term paper; short written papers at intervals during the semester. M 1:25−3:25, E. A. Blackall. A short study of Hoffmann's achievements as a writer of novellas, with special reference to the collection entitled Die Serapionsbruder. Analysis and discussion in class.

German Drama after 1945: Spring. 4 credits. Prerequisite: permission of instructor.

Reading of selected plays by post-World War II East and West German playwrights such as Durrenmatt, Frisch, Handke, and Heiner Muller.

Independent Study: 451, fall; 452, spring. 1−4 credits each term. Prerequisite: permission of instructor. Hours to be arranged. Staff.

Note: For complete descriptions of courses numbered 600 or above consult the appropriate instructor.

Seminar in Old Icelandic Literature I (also English 602): Fall. 4 credits. Hours to be announced. J. C. Harris.

Seminar in Old Icelandic Literature II (also English 612): Spring. 4 credits. Hours to be announced. J. C. Harris.


Seminar in Medieval German Literature II: Not offered 1983−84.

The Northern Renaissance and Reformation: Fall. 4 credits. T 1:25−3:25, S. L. Gilman.

Baroque: Not offered 1983−84.

The Enlightenment: Not offered 1983−84.

From Wilhelm Meister to Buddenbrooks: Not offered 1983−84.

The Age of Goethe: Not offered 1983−84.


Backgrounds of German Realism: Not offered 1983−84.

Nineteenth-Century Drama: Grillparzer and Hebbel: Not offered 1983−84.

Seminar in Realism: Die Novelle: Spring. 4 credits. Prerequisite: permission of instructor. W 3:35−5:35, H. Deinert.

Contemporary German Women Writers: Fall. 4 credits. P 3:35−5:35, E. A. Blackall. A close examination of selected writings, prose and poetry, by some prominent female authors in East and West Germany after World War II. Though the emphasis will be on comparing texts, the conditions for their creation and some antecedents will be surveyed. Among the authors to be considered are Christa Wolf, Ingeborg Bachmann, Gabriele Wohmann, Irtrunord Morgin, Karin Struck, and Verena Stefan.

Modern Lyric Poetry: Not offered 1983−84.

The Modern German Novel: Not offered 1983−84.

Graduate Seminar in Medieval Literature (also English 710): Not offered 1983−84.

The Enlightenment: A Reading of Being and Time: Spring. 4 credits. Prerequisite: permission of instructor.

A reading of Being and Time that tries to reproduce the book’s own logic (constructive criticism), to unveil the implicit but clear references to Marx, Husserl, Freud, etc. (instrumental criticism), and to present the relevance of the book for a literary epistemology.

Tutorial in German Literature: Fall and spring. 1−4 credits per term. Prerequisite: permission of instructor.

Hours to be arranged. Fall, P. W. Nutting; spring, staff. Topic for fall: Kafka and Kafka criticism.
Related Courses in Other Departments

America in the World Economy (Government 354)
Survey of German History, 1648−1890 (History 357)
The European Novel (Comparative Literature 363−364)
Marx after 100 Years (Government 376)
Freud (Government 379)
Seminar in European Imperialism (History 450)
Foreign Economic Policies of Advanced Industrial States (Government 480)

Modern Greek
See listings under Classics.

Modern Hebrew
See listings under Near Eastern Studies.

Hindi-Urdu

101−102 Hindi-Urdu Elementary Course: Fall, 102, spring. 6 credits each term. Prerequisite for Hindi 102: Hindi 101 or equivalent.

M−F 9:05. G. Kelley.
A semi-intensive course for beginners. A thorough grounding in all the language skills is given: listening, speaking, reading, and writing.

201−202 Hindi Reading: Fall 201, fall, 202, spring. 3 credits each term. Prerequisites: for Hindi 201, qualification in Hindi; for Hindi 202, Hindi 201 or permission of instructor.

Hours to be arranged. G. Kelley.
203–204 Composition and Conversation 203: Fall, 204: Spring. 3 credits each term. Prerequisites: for Hindi 203, qualification in Hindi; for Hindi 204, Hindi 203 or permission of instructor. Hours to be arranged. G. Kelley.

301–302 Readings in Hindi Literature 301: Fall; 302: Spring. 4 credits each term. Prerequisites: for Hindi 301, Hindi 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. Not offered 1983–84. 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 Indonesian 102. Not offered 1983–84. Hours to be arranged. G. Kelley.] Note: For complete descriptions of courses numbered 600 and above, consult the appropriate instructor.

[700 Seminar in Hindi Linguistics Fall or Spring. 3 credits. Prerequisite: permission of instructor. Not offered 1983–84. Hours to be arranged. J. W. Gair and G. Kelley.]

Indonesian

101–102 Elementary Course 101, Fall; 102, Spring. 6 credits each term. Prerequisite for Indonesian 102: Indonesian 101. M–F, plus 2 more 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.

300 Linguistic Structure of Indonesian Fall or Spring. 4 credits. Prerequisites: Indonesian 101–102 or equivalent, and Linguistics 101. 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.

FALCON

161–162 Intensive Course 161, Fall; 162, Spring. 16 credits each term. Prerequisite: permission of instructor. M–F, 6 hours each day. J. U. Wolff and staff.

Related Course

Malayo-Polynesian Linguistics (Linguistics 655–656)

Italian

A. Grossvogel, director of undergraduate studies

G. Mazzotta (on leave 1983–84), C. Rosen


History of the Italian Language

Note: Students placed in 200-level courses also have the option of taking courses in introductory literature; see separate listings under Italian 200, 201, and 202 for descriptions of these courses, any of which may be taken concurrently with the Italian 203–204 language courses described above. The introductory literature courses are offered by the respective literature departments, and the 203–204 language courses by the Department of Modern Languages and Linguistics.

300 Advanced Italian: Language in Italian Culture Spring. 3 credits. Prerequisite: Italian 204 or equivalent or permission of instructor.

Ms. W 12:20 or 1:25. C. Rosen and staff.

Further development of all skills, with emphasis on self-expression. Readings center on two themes: (1) contemporary Italian life, its trials and joys, as seen by the satirical columnist Luca Goldoni and others; (2) the Italian language, its origins, development and present state, including the role of the dialects. Emphasis on vocabulary building and awareness of stylistic levels.

402 History of the Italian Language Spring. 4 credits. Prerequisite: Linguistics 101 (or equivalent), and qualification in Italian, or permission of instructor. Not offered 1983–84.

403 Linguistic Structure of Italian Fall. 4 credits. Prerequisite: Linguistics 102 and qualification in any Romance language. Offered alternate years. MWF 2:30. C. Rosen.

Survey of Italian grammar in the light of current linguistic theories. Emphasis is on syntax. Selected topics in phonology, word formation, and semantics.

432 Italian Dialectology Spring, according to demand. 4 credits. Not offered 1983–84. C. Rosen.

Seminar in Italian Linguistics Offered according to demand. 4 credits. Not offered 1983–84. C. Rosen.
Literature

201 Introduction to Medieval and Renaissance Literature 3 credits. Prerequisite: reading knowledge of Italian. M W F 12:20. A. Grossvogel and staff.

The course will focus on the major figures and texts of medieval and Renaissance literature with an eye on the wider cultural context of Italy. We will begin with readings and discussions of the poems of the Sweet New Style (Guinizzelli, Cavalcanti, and Dante) and selections from Petrarch’s Canzoniere and Boccaccio’s Decameron. Finally we shall look at some poems of Michelangelo, one canto from Ariosto’s Orlando Furioso, and Machiavelli’s The Prince.

202 Introduction to Modern Italian Literature 3 credits. Prerequisite: reading knowledge of Italian. M W F 12:20. A. Grossvogel and staff.

A reading of masterpieces of modern Italian literature with attention to the context in which they arose. Highlights of Galileo and Vico’s writing. Selections from the poetry of Michelangelo, one canto from Boccaccio’s La Divina Commedia, and selections from Petrarch’s Canzoniere and Boccaccio’s Decameron. Finally we shall look at some poems of Michelangelo, one canto from Ariosto’s Orlando Furioso, and Machiavelli’s The Prince.

387 Nineteenth Century Poetry: Leopardi Not offered 1983–84]

390 Contemporary Narrative in Italy Not offered 1983–84]

393 Narrative and Ideology in Contemporary Italian Literature (also Italian 593 and Comparative Literature 393) Fall. 4 credits. The course will be taught either in English or Italian, according to demand. T R 10:10–11:25. A. V. Grossvogel. The social, political, and economic frustrations of the south and the alienating effects of industrialization in the north, as reflected in postwar Italian narrative. Works by Calvino, Sciascia, Pavese, Vittorini, Levi, Volponi, Baeasti, Gadda, and Moravia will be read. Most of the texts are available in translation.

395 Literature to Cinema, Cinema to Literature (also Comparative Literature 392) Fall. 4 credits T R 12:20–1:35. A. V. Grossvogel. A study of the ways literary language has influenced Italian cinema and the ways film language has had an impact on contemporary poetry and prose fiction. The films to be screened will be by Antonioni, Bertolucci, Boglioni, De Sica, Fellini, Pasolini, Soldati, Sciamma, Valletta, Zeffirelli, and Zuddini. The works of literature to be read in conjunction with these films will include selections from Boccaccio’s Decameron and from the narrative works by Verga, Fogazzaro, D’Annunzio, Pirandello, Pavese, Pratolini, Moravia, Bassani, Calvino, Buzzati, and Ledda.

419–420 Special Topics in Italian Literature 419, fall 420, spring. 2–4 credits each term. Prerequisite: permission of instructor. 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. The theater of Goldoni and Pirandello. Poetry from Leopardi to Montale.

437 Petrarch: Canzoniere Not offered 1983–84]

472 Eighteenth-Century Theater Not offered 1983–84]

485 The Nineteenth Century: I promessi sposi Not offered 1983–84]

486 Futurism in Italy and Europe Spring. 4 credits. T R 2:30–3:45. A. V. Grossvogel. The narrative, poetic, and dramatic works of the Italian Futurists will be compared and contrasted with their manifestos, critical writings, and propaganda. The literary production of the Futurists will be considered within the wider scope and resonance of the concomitant manifestations in the visual arts. Attention will be given to the attempts of the time to reach a new synthesis of artistic expression involving not only literature but also painting, sculpture, photography, cinematography, architecture, and stage settings. Finally the movement would be seen within the context of European avant-garde: Cubism, Cubo-futurismo, Orphism, and Cercitismo.

527 Dante: La Divina Commedia Not offered 1983–84]

593 Narrative and Ideology in Contemporary Literature (also Italian 393 and Comparative Literature 393) Fall. T R 10:10–11:25. A. V. Grossvogel. For description see Italian 393.

635 Boccaccio Not offered 1983–84]

639–640 Special Topics in Italian Literature 639, fall 640, spring. 4 credits each term. Staff.

656 Medieval Italian Lyric Spring. 4 credits. Prerequisite: reading knowledge of Italian. M 2:30–4:25. R. Jacoff. A study of the origins and development of early Italian lyric, with particular attention to the “Sicilian” poets, Bonagunta da Lucca, Guittone d’Arezzo, Guido Guinizelli, and Guido Cavalcanti. We will look closely at the development of forms such as the sonnet and the canzone and at the poetic debates that took place during this period. We will end by reading the Vita Nuova as a commentary on the lyric tradition.


Related Courses in Other Departments

Studies in the Lyric: Dante, Svevo, and Yeats (Comparative Literature 411/611)

The Rhetoric of Renaissance Humanism (Society for the Humanities 421–422)

Japanese

Language and Linguistics

101–102 Elementary Course 101, fall; 102, spring. 6 credits each term. Prerequisite for Japanese 101: Japanese 101 or permission of instructor. Intended for beginners or for those who have been placed in the course by examination. Lecs, M W F 10:10; drills, M–F 9:05, 11:15, 12:20, or 2:30 E. H. Jorden and staff.

A thorough grounding is given in all the language skills: listening, speaking, reading, and writing.

123 Accelerated Introductory Japanese Fall. 6 credits. Prerequisite: permission of instructor. Lecs, M W F 10:10 (with Japanese 101); drills, M W F 12:20. E. H. Jorden and 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.

141–142 Introductory Japanese for Business Purposes 141, fall; 142, spring. 4 credits each term. Prerequisite for Japanese 142: Japanese 141 or permission of instructor. (For undergraduate only; Graduates, see Japanese 541–542.) M–F 1:25. E. H. Jorden and staff.

Introductory Japanese for students interested in international business and economics.

201–202 Intermediate Japanese I 201, fall; 202, spring. 3 credits each term. Prerequisites: for Japanese 201: Japanese 201 or permission of instructor. for Japanese 202, Japanese 201 and 203 or 204 or permission of instructor. Lecs, M W F 1:25. drill, W 10:10 or 2:30 (with Japanese 205–206). Staff. Reading of elementary texts with emphasis on expository style.
203–204 Japanese Conversation 203, fall, 204, spring. 4 credits each term. Prerequisites: for Japanese 203, Japanese 102 or permission of instructor; for Japanese 204, Japanese 203 or 205 or permission of instructor. Lect, M W 1:25; drills, T R F 10:10 or 2:30 (with Japanese 203). Staff. A combination of Japanese 201–202 and 203–204, for students interested in developing both written and oral skills.

241–242 Intermediate Japanese for Business Purposes 241, fall, 242 spring. 4 credits each term. Prerequisites: for Japanese 241, Japanese 142 or permission of instructor; for Japanese 242, Japanese 241 or permission of instructor. (For undergraduates only. Graduates, see Japanese 543–544.) Hours to be arranged. E. H. Jorden and staff. Intermediate Japanese for students in international business and economics.

301–302 Intermediate Japanese II 301, fall; 302, spring. 4 credits each term. Prerequisites: for Japanese 301, Japanese 202 or 206 or permission of instructor; for Japanese 302, Japanese 301 or permission of instructor. M W F 2:30; lec to be arranged. Staff. Reading of selected modern texts with emphasis on the expository style.

303–304 Communicative Competence 303, fall; 304, spring. 3 credits each term. May be repeated for credit. Prerequisite for Japanese 303, Japanese 204 or 206 or permission of instructor; for Japanese 304, Japanese 303 or permission of instructor. M W F 1:25; E. H. Jorden and staff. Drill in the use of spoken Japanese within the constraints set by Japanese social settings.

401–402 Advanced Japanese 401, fall; 402, spring. 4 credits each term. Prerequisites: for Japanese 401, Japanese 302 or permission of instructor; for Japanese 402, Japanese 401 or permission of instructor. M W F 2:30; lec to be arranged. Staff. Reading of selected modern texts with emphasis on expository style.

[404 Linguistic Structure of Japanese Spring. 4 credits. Prerequisites: Japanese 102 or permission of instructor, and Linguistics 101. Not offered 1983–84. Hours to be arranged. E. H. Jorden.]

407–408 Oral Narration and Public Speaking 407, fall, 408, spring. 2 credits each term. May be repeated for credit. Prerequisite for 408, Japanese 407 or permission of instructor; for 407, Japanese 304 or permission of instructor. T R 1:25. Staff. Instruction in storytelling, lecturing, and speechmaking, with emphasis on both the construction of discourse and Japanese patterns of oral delivery.

421–422 Directed Readings 421, fall; 422, spring. Credit to be arranged. Prerequisite: permission of instructor. Hours to be arranged. Staff. Topics are selected on the basis of students' needs.


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 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 enrolled 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.

There are two introductory course sequences in linguistics: 111–112, which stresses the relationship of linguistics to other disciplines in the humanities and social sciences, and 101–102, which is designed for language majors, linguistics majors, and others who think that they may wish to do further work in the subject. 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 three prerequisites: (1) completion of Linguistics 101–102; (2) a qualification in two languages, one from the familiar European group (Latin, Greek, French, Italian, Portuguese, Spanish, German, Russian) and one from the other languages offered at Cornell; and (3) 6 credits of coursework beyond qualification in the languages studied. 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. Linguistics 301, 310, and 303:
2. A course at or beyond the 300 level in the structure of English or some other language or a typological or comparative structure course such as Linguistics 401;
3. A course in historical method, such as Linguistics 404, 410, or the history of a specific language or family;
4. A minimum of 8 additional credits in linguistics chosen in consultation with the student's adviser. With the adviser's approval, 4 such credits may be in a course in a related discipline with a significant linguistic component, such as psycholinguistics, language acquisition, or anthropological linguistics.

Prospective majors should see Professor Gar. 407 Porrill Hall. For other courses relevant to linguistics, see anthropology, psychology, human development and family studies, computer science, and philosophy.

Honors. Applications for honors should be made during the junior year. Candidates for admission must have a 3.0 (B) average overall and should have a 3.2 average in linguistics courses. In addition to the regular requirements of the major, the candidate for honors will complete an honors thesis and take a final oral examination in defense of it. The thesis is usually written during the senior year but may be begun in the second term of the junior year when the student's program so warrants. The oral examination will be
conducted by the honors committee, consisting of the thesis adviser and at least one other faculty member in linguistics. Members of other departments may serve as additional members if the topic makes this advisable. Linguistics 493 and 494 may be taken in conjunction with thesis research and writing but are not required.

**Distribution Requirement**

The distribution requirement in the social sciences may be satisfied by taking either Linguistics 101 or 111 and (1) any other course in linguistics or (2) any other course offered by the Department of Modern Languages and Linguistics for which one of these introductory linguistics courses is a prerequisite.

See also Modern Languages, Literatures, and Linguistics, pp. 151–152.

### 100 Traditional English Grammar for Foreign Language Students

Fall. 1 credit. Open only to students linguistically enrolled in a foreign language course. S-U grades only.

W 12:20 or R 9:05. 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 exams; 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. Staff. An introductory course designed primarily for those who intend to major in a language or in general linguistics. (See Linguistics 111–112 for a course designed for nonmajors.) 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.)

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. This course together with any other linguistics course other than 101 satisfies the social science distribution requirement.

### 113–114 Hispanic Bilingualism

113, fall; 114, spring. 3 credits each term. Linguistics 113 is not a prerequisite for 114. Freshman Seminar. M W F 1:25. I. Alimirad-Padamar. D. F. Solà. An introductory sociolinguistics course on the English language as used in Spanish-English bilingual communities. Fall semester topics concentrate on variation in the use of Spanish and English in the different Hispanic communities established in the United States.

### 201 Phonetics

Fall. 3 credits.


### 202 Instrumental Phonetics

Spring. 3 credits.

Prerequisite: Linguistics 101 or 201.


### 205 Understanding the Language of Television Images

Fall. 4 credits. Not offered 1983–84.

T R 9:05, M 2–30. L. Waugh and R. Goldsen. TV images convey connotative and denotive meanings that are widely understood. How do we read these images? What is the underlying, grammar-like structure that arranges them as signs and symbols in a shared meaning system? Using the techniques and concepts of content analysis (from sociology and semiotics, from linguistics), we will decode images in product commercials.

### 244 Language and the Sexes (also Women's Studies 244)

Spring. 4 credits. Prerequisites: Linguistics 101 or 111, or Psychology 215, or permission of instructor.

M W F 1:25. Staff.

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, language acquisition, processing models, theories of mental representation and universal grammar, language and cognition.

### 300 Multilingual Societies and Cultural Policy

Spring. 4 credits.


An interdisciplinary analysis of the impact of bilingualism on society, particularly in education and communication arts. The FLEX model is used to suggest a method of evaluating policy and program alternatives.

### 301–302 Phonology I–II

301, fall; 302, spring. 4 credits each term. Prerequisite for 302: Linguistics 301.


A general survey of phonemics and of Jakobsonian distinctive feature theory, as well as selected other topics in autonomic phonology.

### 303–304 Syntax I, II

303, fall; 304, spring. 4 credits each term. Prerequisite for 304: Linguistics 303.


303 introduces the theory of syntax within a generative-transformational framework. 304 is an advanced course on syntax and the relation of syntax to semantics.

### 306 Functional Syntax

Fall. 4 credits. Prerequisite: Linguistics 102 or permission of instructor.


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.

Hours to be arranged. Staff. Methods and procedures of dialectological study with introduction to the major dialect areas.

### 310 Morphology

Spring. 4 credits. Prerequisite: Linguistics 101 or 111 or the equivalent.


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. Prerequisites: for Linguistics 311, Linguistics 102 or permission of instructor; for Linguistics 312, Linguistics 311 or permission of instructor.


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.


A course in modern English for teachers of nonnative speakers. An analysis of the phonetics, grammar, and semantics of the language in terms applicable to both classroom teaching and materials development.

### 314 Teaching English as a Foreign Language

Spring. 4 credits. Prerequisites: Linguistics 313.


A course in modern English for teachers of nonnative speakers. An analysis of the phonetics, grammar, and semantics of the language in terms applicable to both classroom teaching and materials development.

### 341 India as a Linguistic Area

Fall. 4 credits. Prerequisite: Linguistics 102 or permission of instructor.

Hours to be arranged. J. W. Gair, G. Kelley. Cross-familly influences in an area of interaction over a long time span are considered. No knowledge of Indian languages is expected.

### 400 Semiotics and Language

Fall. 4 credits. Prerequisite: a background in linguistics, anthropology, or literary theory, or permission of instructor.


An introduction to the study of semiotics in general and to particular semiotic theories (for example, those of Sausure, Perrie, Jakobson) and to language as a semiotic system.

### 401 Language Typology

Fall. 4 credits. Prerequisite: Linguistics 101–102 or equivalent.

M W F 11:15. C. Rosen.

Study of a basic question of contemporary linguistics: in what ways do languages differ, and in what ways are they all alike? Efforts to characterize the total repertory of constructions available to natural languages. Common morphological devices and their syntactic correlates. Emphasis on two approaches to universals: (1) relational grammar; (2) the work of Joseph Greenberg.

### 402 Languages In Contact

Fall. 4 credits. Prerequisite: Linguistics 101–102 or permission of instructor. Offered alternate years.

M W F 9:05. H. L. Kufner.

Examination of a variety of areas where languages exhibit interference phenomena: diglossia, bilingualism, dialects, second-language acquisition.

### 403 Applied Linguistics and Second-Language Acquisition

Spring. 4 credits. Prerequisite: a course in the structure of a language at the 400 level.


Examination of the theoretical bases of applied linguistics, including 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.

### 405–406 Sociolinguistics

405, fall; 406, spring. 4 credits each term. Prerequisites: Linguistics 101–102 or 111–112 or permission of instructor.

Linguistics 405 is not a prerequisite to 406. Not offered 1983–84.


Social influences (ethnic, socioeconomic, educational) on linguistic behavior, shifts in register, style, dialect, or language in different speech situations.
410 Historical Linguistics: Methods and Approaches Spring. 4 credits. Linguistics 102 or permission of instructor.
T R 12:10-3:10, J. Jasanoff.
A survey of the basic mechanisms of linguistic change, with special attention to comparative and internal reconstruction.

415–416 Social Functions of Language 415, fall; 416, spring. 4 credits each term. Prerequisites: Linguistics 101 or 111, or permission of instructor. Hours to be arranged. G. Kelley.
The function of language in society; social constraints on linguistic behavior, including taboos, jargons, registers, social and socially perceived dialects.

417 History of the English Language Fall. 4 credits. Prerequisite: permission of instructor. M W F 1:25, G. Kelley.
Development of modern English: external history, phonological, grammatical, and lexical change. The English language in America.

421 Linguistic Semantics Spring. 4 credits. S. McConnell-Ginet.

[436 Language Development (also Psychology 436 and Human Development and Family Studies 436) Spring. 3 or 4 credits. Prerequisites: at least one course in cognitive psychology, cognitive development, or linguistics. Offered alternate years. Not offered 1983–84, next offered 1984–85. T R 10:10–12:05, B. Lust.
A survey of basic literature development. Major theoretical positions in the field are considered in the light of studies in first-language acquisition of phonology, syntax, and semantics from infancy onward. The fundamental issue of relations between language and cognition will be discussed. The acquisition of communication systems in nonhuman species such as chimps, and problems of language pathology will also be addressed, but main emphasis will be on normal language development in the child.]

[440 Dravidian Structures Fall or spring, according to demand. 4 credits. Prerequisite: Linguistics 102. Hours to be arranged. G. Kelley.
A comparative and contrastive analysis of the structures of several Dravidian languages.]

442 Indo-Aryan Structures Fall or spring, according to demand. 4 credits. Prerequisite: Linguistics 102. Hours to be arranged. J. W. Gair.
Typological discussion of the languages of the subfamily, phonology and grammar.

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. G. N. Clements, F. E. Huffman.
Elicitation, recording, and analysis of data from a native speaker of a language not generally known to students.

602 Proseminar: Introduction to Graduate Study in Linguistics Spring. 4 credits. Prerequisites: Linguistics 100 or 200. 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. T R 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 1983–84. Hours to be arranged. J. E. Grimes.
Readings and descriptions of major contemporary schools of linguistic thought in the twentieth century.]

608 Discourse Analysis Spring. 4 credits. Prerequisite: permission of instructor. Hours to be arranged. J. E. Grimes.
Linguistic theory applied to relationships beyond the sentence.

610 Topics in Transformational Grammar Fall or spring. 3 credits. Prerequisite: permission of instructor. Hours to be arranged. J. S. Bowers.
A survey of the development and current state of generative grammatical theory.

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. Hours to be arranged. J. Jasanoff.
Fall: Introduction to phonology; branches of the family. Spring: Grammar.

631–632 Comparative Indo-European Linguistics 631, fall; 632, spring. 4 credits each term. Prerequisites: for Linguistics 631, permission of instructor; for Linguistics 632, Linguistics 631 or permission of instructor. Not offered 1983–84. J. Jasanoff.
Fall: Historical linguistics; introduction to phonology and semantics of languages.

640 Elementary Pall Fall or spring, according to demand. 3 credits. Hours to be arranged. J. W. Gair.
An introduction to the language of the canonical texts of Theravada Buddhism. Reading of authentic texts, with emphasis on both content and grammatical structure.

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 Malay-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 Malay-Polynesian languages.

667–698 Seminar in Austroasiatic Linguistics 667, fall; 668, spring. 4 credits each term. Prerequisites: Linguistics 102 and permission of instructor. Hours to be arranged. F. E. Huffman.
Descriptive and comparative studies of Austroasiatic 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 archaic 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-Burman branch and historical study of Burmese.

Pall
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 1983–84. M W F 9:05. Staff.]

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

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. M–F 10:10 or 11:15. Staff.
A thorough grounding is given in all the language skills: listening, speaking, reading, and writing.

203–204 Intermediate Composition and Conversation 203, fall; 204, spring. 3 credits each term. Prerequisites: for Portuguese 203, qualification in Portuguese; for Portuguese 204, Portuguese 203 or permission of instructor. M W F 12:20, Staff.
Conversational grammar review with special attention to pronunciation and the development of accurate and idiomatic oral expression. Includes readings in contemporary Portuguese and Brazilian prose and writing practice.
[303–304 Advanced Composition and Conversation 303, fall; 304, spring. 4 credits each term. Prerequisite: for Portuguese 303, Portuguese 204 or equivalent; for Portuguese 304, Portuguese 303 or equivalent. Not offered 1983–84. M W F 11:15. Staff.]

305–306 Readings in Luso-Brazilian Culture 305, fall; 306, spring. 4 credits each term. Prerequisites: Portuguese 204 or equivalent or permission of instructor. M W F 2:30. Staff.

[700 Seminar in Portuguese Linguistics Fall or spring. Credit is arranged. Prerequisite: permission of instructor. M W F 2:30. Staff.]

Selected problems in the structure of Portuguese]

Quechua

131–132 Elementary Course 131, fall; 132, spring. 3 credits each term. Prerequisite: qualification in Spanish.


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. Soló. An intermediate conversation and reading course. Study of the Huarochari manuscript.

700 Seminar in Quechua Linguistics Fall or spring. Credit is arranged. Prerequisite: permission of instructor. Hours to be arranged. D. F. Soló.

Romance Linguistics and Literature

Linguistics


Diachronic development of the Romance languages from Latin, with emphasis on Spanish, French, Italian, and Romanian. 321 concentrates on external history and phonological changes; 322 concentrates on morphological and syntactic developments.]

323 Comparative Romance Linguistics Spring. 4 credits. Prerequisite: Linguistics 101 (or equivalent) and qualification in any Romance language.

Hours to be arranged. C. Rosen.

Basic characteristics of the Romance language family. Salient features of eight Romance languages; broad and localized trends in phonology, syntax, and the lexicon; elements of dialectology.

[620 Area Topics in Romance Linguistics Spring. 4 credits. May be repeated for credit. Not offered 1983–84, next offered 1984–85. Hours to be arranged. J. S. Nobleit.]

621 Problems and Methods in Romance Linguistics Spring. 4 credits. Prerequisite: Linguistics 401 or permission of instructor. Not offered 1983–84. 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 1983–84. Diachronic and synchronic survey of dialects of the Romance language areas. See also Classics 423 (Vulgar Latin).]

Literature


[303 Iams: General Concepts in Modern Cultural History (also Comparative Literature 303) Not offered 1983–84.]

355 The Picaresque Novel in a European Perspective (also Comparative Literature 355) Not offered 1983–84.

459 Being, God, Mind: Key Terms of Western Thought from Plato to Vico (also Comparative Literature 359) Not offered 1983–84.


Related Course in Another Department

The Hermeneutic Tradition (Comparative Literature 699)

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

L. H. Babby, E. W. Browne, P. Carden, C. Emerson, G. Gibian, R. L. Lead (director of undergraduate studies [language], 302 Morrill Hall, 256-2322), N. Perina, P. Schmid, S. Senderovich (director of undergraduate studies [literature], 194 Goldwin Smith Hall, 256-4047), I. Serman, A. Zhokovsky

The Russian Major

Russian majors study Russian language, literature, and linguistics, emphasizing their specific interests. It is desirable, although not necessary, for prospective majors to complete Russian 101–102, 201–202, and 203–204 as freshmen and sophomores. Since these courses are prerequisites to most of the junior and senior courses that count toward the major. Students may be admitted to the major upon satisfactory completion of Russian 102 or the equivalent. Students who elect to major in Russian should consult both Professor Senderovich and Professor Lead 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 Russian literature in the original language.

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, and 105.

Russian and Soviet Studies Major

See Special Programs and Interdisciplinary Studies, which follows the department listings.

Language and Linguistics

101–102 Elementary Courses 101, fall; 102, spring. 6 credits each term. Prerequisite for Russian 102: Russian 101 or equivalent. Intended for beginners or students placed by examination and those who wish to obtain qualification within two semesters or who wish to enter the 200-level sequence the following fall semester.

Lecs, T R 11:15 or T R 2:30; drills M F 9:05, 12:20, or 1:25. R. L. Lead 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. Students who obtain a CPT achievement score of 560 after Russian 121–122 attain qualification and may enter the 200-level sequence; otherwise Russian 123 is required for qualification.

Lecs, T 7:30–9:30; drills, M W F 8 or 2:30. 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. M–F 3:30. Staff.

A prequalification course designed to prepare students for study at the 200 level. Passing this course is equivalent to qualification.

203–204 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 W R F 11:15 or 2:30. J. Bosky.

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. Prerequisite: for Russian 303, Russian 204 or equivalent; for Russian 304, Russian 303 or equivalent.


305–306 Directed Individual Study 305, fall; 306, spring. 2 credits. Prerequisites: for Russian 305, Russian 303–304 or equivalent; for Russian 306, Russian 305.

Hours to be arranged. J. Bosky.

This is a practical language course on an advanced level and is designed to improve oral control of colloquial Russian.

[401–402 History of the Russian Language 401, fall; 402, spring. 4 credits each term. Prerequisites: for Russian 401, qualification in Russian; for Russian 402, Russian 401 or equivalent. Offered alternate years. Not offered 1983–84.]

Hours to be arranged. L. H. Babby.

Phonological, morphological, and syntactic developments from Proto-Slavic to modern Russian.]

164 Arts and Sciences
403-404 Linguistic Structure of Russian 403, fall; 404, spring. 4 credits each term. Prerequisite for Russian 403: qualification in Russian, Linguistics 101-103 recommended. Prerequisite for Russian 404: Russian 403 or equivalent. Offered alternate years. Hours to be arranged. L. H. Babby.

A synchronic study and analysis of Russian linguistic structure. Russian 403 deals primarily with phonology and morphology and 404 with syntax.

[405-406 Advanced Russian Morphology and Syntax 405, fall; 406, spring. 4 credits each term. Prerequisites: for Russian 405, Russian 304 or permission of instructor; for Russian 406, Russian 404. Not offered 1983-84.

Hours to be arranged. L. H. Babby.

This course is intended primarily to increase the student's active command of difficult Russian syntactic structures. Special attention is paid to word order; impersonal sentences, negation, participles, gerunds, and also to building active vocabulary.]

601 Old Church Slavonic Fall. 4 credits. This course is prerequisite to Russian 602. Offered alternate years. E. W. Browne.

Grammar and reading of basic texts.

602 Old Russian Spring. 4 credits. Prerequisite: Russian 601. Offered alternate years. H. Babby.

Structural analysis of Old Russian and close reading of texts.

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 prehistoric common Slavic; main historical developments leading to the modern languages.

700 Seminar in Slavic Linguistics Offered according to demand. Variable credit.

Staff.

Topics chosen according to the interests of staff and students.

Literature

103 Freshman Seminar: Classics of Russian Thought and Literature Fall and spring. 3 credits each term.

T R 12:20-1:35. Staff.

Emphasis is on connections between Russian literary masterpieces and their historical background. The seminar covers both nineteenth- and twentieth-century works. Readings in English translation of Dostoevsky, Solzhenitsyn, and others.

104 Freshman Seminar: Nineteenth-Century Russian Literary Masterpieces Fall and spring. 3 credits each term.


Readings in English translation of works by Dostoevsky, Turgenev, and others; limited to nineteenth-century authors. A slightly more literary and less historical course than Russian 103.

105 Freshman Seminar: Twentieth-Century Russian Literary Masterpieces Fall and spring. 3 credits each term.

T R 2:30-3:45. Staff.

Readings in English translation of works by Babel, Pasternak, Solzhenitsyn, and others, studied against the background of Soviet social and political developments.

[106 Freshman Seminar: Revolution In the Russian Arts Not offered 1983-84.

201-202 Readings in Russian Literature 201, fall; 202, spring. 3 credits each term. Prerequisite: qualification in Russian. Open to freshmen. Formal requirements: daily homework sheets, occasional quizzes on vocabulary with questions on the texts in Russian and English, a final exam, and one semester paper (10-12 pages) to be written in English on a topic of the student's choice.

M W F 10:10. Staff; fall; C. Emerson, spring.

Designed as the first literature course taken entirely in Russian—both readings and class discussions. But daily assignments are short and considerably guidance is provided; there is no presumption of fluency. The goals of the course are to introduce students to major genres (lyric poetry, fairy tale, drama, narrative prose), to sample widely-differing literary styles, and to accomplish both without recourse to English in class. Readings from the nineteenth century masters: Pushkin, Gogol, Tolstoy, Dostoevsky, supplemented by twentieth-century poetry. Whenever possible, selected texts are also studied in "transposed" form—first the original, then an illustrated film strip, poetic reading, musical setting, or excerpt from an opera libretto. (Mussorgsky's Boris Godunov, Rimsky-Korsakov's Tsar Saltan, Prokofiev's War and Peace).

[307 Themes from Russian Culture Not offered 1983-84]

308 Themes from Russian Culture Spring. 4 credits. Requirements: regular attendance and class participation; two in-class midterms; one final exam; written paper (10-12 pages) to be written in English on a topic of the student's choice.

M W F 1:25. C. Emerson.

The major themes of Russian realism: how have Russian and Soviet writers, in the last one hundred years, attempted to tell the truth through art? Readings by Tolstoy (nineteenth-century realism), Chekhov, to be supplemented by Bulgakov (fantastic realism), Sholokhov and Gladkov (realist realism), and Solzhenitsyn. Supporting themes include the liberating (and later enslaving) effect of the Revolution, the politicization of Russian literature, and various competing theories of realism as a mode of art. Background lectures on social and political history provided.

[314 Intellectual Background of Russian Literature 1825-1930 Not offered 1983-84.


T R 2:30-3:45. G. Gibian, M. Rush, G. Staller.

Interdisciplinary survey of the USSR since the Revolution, with emphasis on contemporary developments.

[331 Russian Poetry Not offered 1983-84.

332 Russian Theatre and Drama Not offered 1983-84.

334 The Russian Short Story Spring. 4 credits. There may be a section for Russian majors. A variety of approaches will be employed: informal lectures and discussions.

[369 Dostoevsky Not offered 1983-84.

379 The Russian Connection (also Comparative Literature 379) Not offered 1983-84.

388 Politics and the Novel (also Comparative Literature 388) Fall. 4 credits.

M W F 9:05. G. Gibian.

From the French Revolution to the present. Literary representations of conflicts between political ideologies (ideals of revolution, justice, nationalism) and private needs (art, nature, love, order). Marx, Stendhal, Dostoevsky, Conrad, Henry James, Trotsky, Lenin, W. S. Naipaul, Solzhenitsyn, Kundera. Some poetry will also be included. Yeats, Mayakovsky, Auden. Lectures and discussions.

[389 Modern Literature in Poland, Czechoslovakia, and Yugoslavia (also Comparative Literature 389) Not offered 1983-84.

393 Honors Essay Tutorial Fall or spring. 4 credits. Hours to be arranged. Staff.

[415 Fairy tale and Narrative (also Comparative Literature 415) Not offered 1983-84.

431 Short Russian Prose Not offered 1983-84.

432 Pushkin Not offered 1983-84.

491 Reading Course: Russian Literature in the Original Language Fall or spring. 1 credit 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.

492 Supervised Reading in Russian Literature Fall or spring. 1-4 credits each term. Hours to be arranged. Staff.

Topic for Fall: Translating modern Russian poetry. 1 credit. P. Schmidt. An analysis of four Russian modernist poets, Khlebnikov, Mayakovsky, Tsvetaeva, and Akhmatova, using the process of translation as a tool of critical analysis. The class will meet for six seminar sessions, each two hours long, over a period of two weeks. Each student will work on a translation project as part of the course work and Mr. Schmidt will be available to individual students for consultation.

T R 9:05 plus one hour to be arranged. G. Gibian.

Study of the major Russian prose writers of the nineteenth and twentieth centuries. Novels and short stories by Gogol, Turgenev, Tolstoy, Dostoevsky, Chekhov, Solzhenitsyn, and others.

380 Soviet Literature Fall. 4 credits. Also open to graduate students. There will be a special section for those able to read Russian.


Selected works of Russian literature, 1917 to date, examined primarily as works of art, with some attention to their social, political, and historical importance. Mayakovsky, Babel, Pasternak, Solzhenitsyn, and others. In English translation.

[369 Dostoevsky Not offered 1983-84.]

373 Chekhov (in English Translation) 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 for the Russian major.

T R 2:30-3:45. S. Senderovich.

Reading and discussion of Chekhov's works, with main emphasis on the short story. The course is designed for nonspecialists as well as literature majors. A variety of approaches will be employed: informal lectures and discussions.

[379 The Russian Connection (also Comparative Literature 379) Not offered 1983-84.

388 Politics and the Novel (also Comparative Literature 388) Fall. 4 credits.

M W F 9:05. G. Gibian.

From the French Revolution to the present. Literary representations of conflicts between political ideologies (ideals of revolution, justice, nationalism) and private needs (art, nature, love, order). Marx, Stendhal, Dostoevsky, Conrad, Henry James, Trotsky, Lenin, W. S. Naipaul, Solzhenitsyn, Kundera. Some poetry will also be included. Yeats, Mayakovsky, Auden. Lectures and discussions.

[389 Modern Literature in Poland, Czechoslovakia, and Yugoslavia (also Comparative Literature 389) Not offered 1983-84.

393 Honors Essay Tutorial Fall or spring. 4 credits. Hours to be arranged. Staff.

[415 Fairy Tale and Narrative (also Comparative Literature 415) Not offered 1983-84.

431 Short Russian Prose Not offered 1983-84.

432 Pushkin Not offered 1983-84.

491 Reading Course: Russian Literature in the Original Language Fall or spring. 1 credit 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.

492 Supervised Reading in Russian Literature Fall or spring. 1-4 credits each term. Hours to be arranged. Staff.

Topic for Fall: Translating modern Russian poetry. 1 credit. P. Schmidt. An analysis of four Russian modernist poets, Khlebnikov, Mayakovsky, Tsvetaeva, and Akhmatova, using the process of translation as a tool of critical analysis. The class will meet for six seminar sessions, each two hours long, over a period of two weeks. Each student will work on a translation project as part of the course work and Mr. Schmidt will be available to individual students for consultation.
493 Tolstoy's War and Peace and Children's Stories: Thematic Invariance and Plot Structure Not offered 1983–84

494 Early Literary Semiotics, East and West Not offered 1983–84

498 The Age of Symbolism Not offered 1983–84

499 Russian Modernism Not offered 1983–84

Graduate Seminars

611 Supervised Reading and Research Fall or spring. 2–4 credits. Prerequisite: permission of the department. Hours to be arranged. Staff.

617 Russian Stylistics I Not offered 1983–84.

618 Russian Stylistics II Spring. 4 credits. Open to advanced undergraduates. Conducted in Russian. R 4–6. S. Senderovich. Introduction to the diversity of styles of modern Russian and training in stylistically coherent writing.


621 Russian Literature from the Beginnings to 1700 Not offered 1983–84.


625 Russian Realism Not offered 1983–84.


701 Proseminar: Methods in Research and Criticism Not offered 1983–84.

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

308 Themes from Russian Culture

330 The Soviet Union: Politics, Economics, and Culture (also Economics and Government 330)

334 The Russian Short Story

367 The Russian Novel

368 Soviet Literature

373 Chekhov

388 Politics and the Novel (also Comparative Literature 388)

Courses in Russian

201–202 Readings in Russian Literature

491 Reading Course: Russian Literature in the Original Language

492 Supervised Reading in Russian Literature

611 Supervised Reading and Research

618 Russian Stylistics II

624 Russian Romanticism

671 Seminar in Nineteenth-Century Russian Literature

Sanskrit

See Linguistics 641–642.

Serbo-Croatian

131–132 Elementary Courses 131, fall; 132, spring. 3 credits each term. Prerequisites for Serbo-Croatian 132: Serbo-Croatian 131 or equivalent. Hours to be arranged. E. W. Browne.

[133–134 Intermediate Course II 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 1983–84. 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

U. J. DeWinter, J. W. Kronik, C. Moron-Arroyo, C. Piera, M. Randal (director of undergraduate studies [literature], 291 Goldwin Smith Hall, 256-4766); E. M. Sanfil, M. Suhler (director of undergraduate studies [language], 218 Morrill Hall, 256-3384); J. Tittel, K. Vernon

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 the director of undergraduate studies in Spanish, Professor Randel (291 Goldwin Smith Hall), who will admit them to the major, and choose an adviser from the Spanish faculty of either the Department of Romance Studies or the Department of Modern Languages and Linguistics. Spanish majors will then work out a plan of study in consultation with their advisers. Previous training and interests as well as vocational goals will be taken into account when the student's program of courses is determined.

Spanish 201 and 204 or 212 (or equivalent) are prerequisite to entering the major in Spanish. All majors will normally include the following core courses in their programs:

1) two literature courses of the 315–316–317 series.
2) 311 and 312 (or equivalent).

Spanish majors have great flexibility in devising their programs of study and areas of concentration. Some typical options of the major are:

1) Spanish literature, for which the program of study normally includes at least 24 credits of Spanish literature beyond the core courses. Literature majors are strongly urged to include in their programs courses in all the major periods of Hispanic literature.

2) Spanish linguistics for which the program normally includes 401, 407, 408, and at least 12 additional credits in general or Spanish linguistics. (Linguistics 101–102 are recommended before entering this program.) Students interested in including linguistics in their programs should consult with the coordinator of Spanish for the Department of Modern Languages and Linguistics (Professor M. Suhler).

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 on one of the study-abroad programs organized by American universities that allow the transfer of grades and credits. 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).

Fees. Depending on the course, a small fee may be charged for copies of texts for course work.
Language and Linguistics

121-122 Elementary Course Fall, 122, spring. 4 credits each. 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 Advanced Composition and Conversation Fall or spring. 4 credits. Continuation of Spanish 311 but may be taken separately. Required of Spanish majors.

311 Advanced Composition and Conversation (formerly 303) Fall. 4 credits. Prerequisite: Spanish 204 or equivalent.

312 Advanced Composition and Conversation Spring. 4 credits. Continuation of Spanish 311 but may be taken separately. Required of Spanish majors.

401-402 History of the Spanish Language Fall or spring, 3 credits. Prerequisite: qualification in Spanish.

408 The Grammatical Structure of Spanish Spring. 4 credits. Prerequisites: qualification in Spanish and Linguistics 101 or permission of instructor.

601 Hispanic Dialectology Fall, according to demand. Survey of the salient morphological and syntactic characteristics of contemporary Spanish.

602 Linguistic Structure of Ibero-Romance Fall or spring, according to demand. Prerequisites: qualification in Spanish and Linguistics 101 or permission of instructor.

603 Contemporary Theories of Spanish Phonology Fall or spring, according to demand. Variable credit.

604 Contemporary Theories of Spanish Grammar Fall or spring, according to demand. Variable credit.

700 Seminar in Spanish Linguistics Fall or spring, according to demand. Variable credit.

Literature

201 Introduction to Hispanic Literature Fall or spring. 3 credits. Prerequisite: qualification in Spanish or permission of instructor. Conducted mainly in Spanish. (The literature course that normally follows Spanish 201 is 315, 316, or 317.)

313 Spanish Civilization: Spain after Franco Fall. 4 credits. Prerequisite: qualification in Spanish.

435 The Contemporary Spanish-American Novel Fall. 4 credits. Conducted in Spanish.

436 Popular Culture in Contemporary Spanish-American Prose Fiction Not offered 1983-84.

200 Introduction to Hispanic Literature Fall or spring. 3 credits. Prerequisites: qualification in Spanish or permission of instructor. Conducted mainly in Spanish. (The literature course that normally follows Spanish 201 is 315, 316, or 317.)

401-402 History of the Spanish Language Fall or spring, 3 credits. Prerequisites: qualification in Spanish or permission of instructor. Conducted mainly in Spanish. (The literature course that normally follows Spanish 201 is 315, 316, or 317.)

407 Applied Linguistics: Spanish Fall. 4 credits. Prerequisites: qualification in Spanish and Linguistics 101, or permission of instructor.

408 The Grammatical Structure of Spanish Spring. 4 credits. Prerequisites: qualification in Spanish and Linguistics 101 or permission of instructor.

409 The Sounds of Spanish Analyzed according to Generative Theory Fall or spring, according to demand. 4 credits.
Reading and discussion of selected works of narrative fiction by today's leading authors: Cabrera Infante, Coríaz, Donoso, Fuentes, García Márquez, Vargas Llosa, and others.

346 Hispanic Caribbean Culture and Literature
An introduction to the history, culture, and literature of the Hispanic Caribbean, with major emphasis on Cuba, Santo Domingo, and Puerto Rico. Analysis of the cultural and social peculiarities of the Caribbean area and its expression in art. Plantation and slave societies; the African influence in literature and popular music; emigration, and revolution are among the topics we will explore in the works of Marti, Hoetos, Ortiz, Guifó, Palet Moló, Carpenter, Bosch, Arenas, Sánchez, and others.

[351] Spanish Drama of the Golden Age
Not offered 1983-84.

[355] Cervantes: Don Quijote
Fall. 4 credits. Taught in Spanish. MWF 10:10-10:30. M. Randel.
Close reading of Cervantes’s masterpiece. Discussions will consider the text as a mirror of its historical moment, of its self-conscious author, of its readers’ search for meaning.

[356] Spanish Lyric Poetry of the Golden Age

[358] The Birth of the Novel in Spain: Toward Don Quixote
Not offered 1983-84.

375 The Picaroscopic Novel in a European Perspective
A study of picaroesque novels from the sixteenth to the eighteenth centuries. Discussions will focus on fictional representations of the antiheroic rogue and the seamy side of life as evidence of social consciousness and as an ongoing series of experiments in the writing of prose fiction. Spanish texts of Lazarillo de Tormes, Alemán, Cervantes, Quevedo, Cela and others will be supplemented by readings in other European Picaroesque (in translation as necessary).

376 The Contemporary Spanish Novel

[386] The Nineteenth-Century Spanish Novel
Not offered 1983-84.

389 The Generation of 1898
Fall. 4 credits. T R 12:30-1:35. J. DeWinter.
In 1898 a generation of writers brought about a major transformation of the artistic, intellectual, and historical climate of Spain. We will discuss novels, essays, poems, and plays by Unamuno, Valle-Inclán, Baroja, Azorín, Machado, Benavente (Nobel Prize in 1922), Juan Ramón Jiménez (Nobel Prize in 1956), and Pérez de Ayala. This cosmopolitan group of writers broke with the conventional literary genres of the nineteenth century: they introduced a new intimate and existentialist novel; they created a new poetic language, and they integrated the main artistic and philosophical movements of Europe and America, including symbolism, modernism, irrationalism, and vitalism.

[390] Sociology and Literature in Twentieth-Century Spain
Not offered 1983-84.

[391] The Post-Civil War Drama in Spain
Not offered 1983-84.

[392] Valle-Inclán and the Twentieth-Century Vanguard Theatre in Spain
Spring. 4 credits. Not offered 1983-84. J. Kronik.

[393] The Reader in the Novel (also Comparative Literature 369)
Fall. 4 credits. Not offered 1983-84. K. Vernon.

[394] Art and Politics in Latin America
Not offered 1983-84.

[395] The Novel in Spain after the Civil War
Fall. 4 credits. Not offered 1983-84. J. Kronik.

[396] Modern Latin American Poetry in Translation (also Comparative Literature 396)
Not offered 1983-84.

[398] Modern Hispanic Poetry
Not offered 1983-84.

399 Spanish Film
Spring. 4 credits. T R 2:30-3:45. Students should also reserve W afternoons and evenings for some film viewing. K. Vernon.
A course devoted to the appreciation and analysis of recent Spanish cinema. Beginning with the works of its best-known directors, Bunuel and Saura, we will focus on Spanish film as a narrative response to Spanish reality, both artistic (in the filmic translation of other media, such as novel and ballet) and historical (in particular, the Spanish Civil War and its consequences).

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.

[439] Medieval Literature
Not offered 1983-84.

440 Medieval Spanish Literature to 1400
Spring. 4 credits. Open to majors. Taught in Spanish. T R 2:30-3:45. C. M. Arroyo.
A study of the major works of medieval Spanish literature in light of contemporary scholarship and methodologies. Readings include Mio Cid, Libro de Buen Amor, Conde Lucanor. Excerpts from Alfonso X’s Chronicle, and an anthology of medieval lyrics.

[441] Medieval Literature 1300-1508
Not offered 1983-84.

445 The Early Spanish Love Lyric: Origins to 1700

456 Figurative Landscapes in Spanish-American Fiction
Not offered 1983-84.

[457] Readings from Don Quijote’s Library (also Comparative Literature 358)
Not offered 1983-84.

459 Being, God, Mind: Key Terms of Western Thought from Plato to Vico (also Romance Studies 459 and Comparative Literature 359)
Fall. Not offered 1983-84. C. M. Arroyo.

[461] The Rhetoric of Honor
Not offered 1983-84.

[466] Cervantes: Don Quijote
Not offered 1983-84.

[479] Colonial Spanish-American Literature
Not offered 1983-84.

[481] Eighteenth- and Nineteenth-Century Spanish Drama
Not offered 1983-84.

[486] Realism and Naturalism in Spain: Clarín, Pardo Bazán, Blasco Ibáñez
Spring. 4 credits. Not offered 1983-84. J. Kronik.

[489] Hispanic Romanticism
This course will focus on the development of modern Spanish poetry from Becquer to the present. Readings will include texts by Becquer, Machado, Lorca, Jiménez, Guillén, and others as well as poetic and theoretical works designed to help us situate Spanish poetry with respect to such contemporary European esthetics as romanticism, symbolism, and post-symbolism.

639-640 Special Topics in Hispanic Literature
639, fall; 640, spring. 4 credits each term. To be taken by all new graduate students. Staff.

[647] Studies in the Literature of Fifteenth-Century Spain
Fall. 4 credits. Not offered 1983-84. C. M. Arroyo.

[649] Carlos Fuentes
Spring. Not offered 1983-84.

[690] Graduate Seminar: Baroque and Neobaroque

693 Ortega y Gasset
Fall. 4 credits. Taught in Spanish. T 2:30-4:25. C. M. Arroyo.
A detailed study of Ortega’s writings on metaphor (1914), the novel (1914-1925), and the Dehumanization of Art (1925) in comparison with some poems and novels, and with Lukács’s Theory of the Novel and Heidegger’s The Origin of the Work of Art.

695 Graduate seminar: Gabriel García Márquez
A detailed study of García Márquez’s Cien años de soledad and El otoño del patriarca and of the criticism to which these acclaimed novels have given rise. An attempt will be made to assess the Nobel laureate’s place in Colombian, Spanish-American, and Western literature.

[696] The Contemporary Spanish-American Novel
Not offered 1983-84.

[699] Ortega y Gasset’s The Dehumanization of Art and Ideas of the Novel (1925) (also Comparative Literature 690)
Not offered 1983-84.

Related Course in Another Department
The European Novel (Comparative Literature 363-364)

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. Not offered 1983-84. Hours to be arranged. J. U. Wolff.
Tagalog Reading 201, fall; 202, spring. 3 credits each term. Prerequisites: for Tagalog 201, Tagalog 102 or equivalent; for Tagalog 202, Tagalog 201 or equivalent. Hours to be arranged. J. U. Wolff.

[300] Linguistic Structure of Tagalog Fall or spring. 4 credits. Prerequisite: Linguistics 101. Not offered 1983–84. Hours to be arranged. J. U. Wolff.

Tamil

101–102 Elementary Course 101, fall, 102, spring. 6 credits each term. Offered according to demand. Prerequisite for Tamil 102. Tamil 101 or equivalent. Hours to be arranged. J. W. Gait.

Telugu

101–102 Elementary Course 101, fall, 102, spring. 6 credits each term. Prerequisite for Telugu 102. Telugu 101 or equivalent. Hours to be arranged. G. Kelley.

201–202 Telugu Reading 201, fall, 202, spring. 3 credits each term. Prerequisites: for Telugu 201: qualification in Telugu; for Telugu 202, Telugu 201 or equivalent. Not offered 1983–84. G. Kelley.] See also Linguistics 341, 440.

Thai

101–102 Elementary Course 101, fall, 102, spring. 6 credits each term. Prerequisite for Thai 102: Thai 101 or equivalent. Intended for beginners or students placed by examination. Lect., T R 11:15; drills, M–F 10:10. R. B. Jones. A thorough grounding is given in all the language skills: listening, speaking, reading, and writing.

201–202 Thai Reading 201, fall, 202, spring. 3 credits each term. Prerequisites: for Thai 201, qualification in Thai; for Thai 202, Thai 201 or equivalent. M W F 2:30. R. B. Jones.

203–204 Composition and Conversation 203, fall; 204, spring. 3 credits each term. Prerequisites: for Thai 203, qualification in Thai; for Thai 204, Thai 203. Hours to be arranged. R. B. Jones.

301–302 Advanced Thai 301, fall, 302, spring. 4 credits each term. Prerequisite: Thai 201–202 or equivalent. M W F 12:20. R. B. Jones. Selected readings in Thai writings in various fields.

303–304 Thai Literature 303, fall; 304, spring. 4 credits each term. Prerequisite: Thai 301–302 or equivalent. Hours to be arranged. R. B. Jones. Reading of significant novels, short stories, and poetry written since 1850.

401–402 Directed Individual Study 401, fall; 402, spring. 4 credits each term. For advanced students. Prerequisite: permission of instructor. Hours to be arranged. R. B. Jones.

Turkish

131–132 Introduction to the Turkish Language 131, fall; 132, spring. 3 credits each term. Not offered 1983–84. Hours to be arranged. L. Babby.

Music

Music 169

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 prerequisite 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 (256-4975), 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 in none of them; and the passing of a simple piano examination (details are available from the department office). Students must apply to the major in music under Option I comprise the following:

1) in music theory:
   a) Music 251–252, 351, and 352.
   b) passing of a simple literacy test in music, normally by the end of the junior year (details are available in the department office).

2) in music history:
   a) at least one course each in music history, sixteen credits in courses numbered at the 300 level or above listed under Music History. At least two of these courses must be drawn from the three-course sequence Music 381–383.
   b) in performance:
   c) four semesters of participation in a musical organization or ensemble sponsored by the Department of Music.
Option II presupposes considerable musical study before entering Cornell. Prerequisites for admission into the Option II program are previous acceptance as an Option I major and satisfactory completion of Music 252, normally by the end of the sophomore year. Students enrolled in 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 senior year.

The requirements for the Bachelor of Arts degree with a major in music under Option II are:

1) completion of all the requirements for Option I, except as noted below, and

2) in addition:
   a) in performance,
      (1) the requirement for four semesters of participation in a musical organization or ensemble is waived (but such majors are expected to participate actively in chamber and other ensembles sponsored by the department);
      (2) sixteen credits in individual instruction in the student’s major instrument, or voice, earned by taking Music 391–392 throughout the junior and senior years;
   b) in theory and composition or in history:
      (1) for two of the four semesters of participation in a musical organization or ensemble, Music 462 or 463 may be substituted;
      (2) twelve additional credits in the area of concentration at the 300 level or above, of which either four may be earned in Music 301 or 302 when taken once for four credits, or eight may be earned in Music 401–402.

Honors. The honors program in music is intended to provide special distinction for the department’s ablest undergraduate majors. To become a candidate for honors in music, a student must be invited by the faculty at the beginning of the second semester of the junior year. In the spring of that year, the student will form a committee of three faculty members to guide and evaluate the honors work. In the senior year the candidate will enroll in Music 401–402, with the chairperson of the honors committee as instructor. Candidates will be encouraged to formulate programs that will allow them to demonstrate their total musical ability. The level of honors conferred will be based on the whole range of the independent work in this program, of which a major part will culminate in an honors thesis, composition, or recital to be presented not later than April 1 of the senior year, and a comprehensive examination to be held not later than May 1.

Distribution Requirement

The distribution requirement in the expressive arts may be satisfied with 6 credits in music, except Freshman Seminars and Music 122. A maximum of 4 credits in Music 321–322 and a maximum of 3 credits in Music 331 through 338 and 441 through 450 may be used to satisfy this requirement.

Facilities

Music Library. The Music Library, in Lincoln Hall, has an excellent collection of the standard research tools. Its holdings consist of approximately ninety thousand books, and one thousand records. Particularly noteworthy are the collections of opera scores, libretti, and recordings from all periods; twentieth-century scores and recordings; and the large miscellaneous resources, 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 Chalis harpsichord and clavichord are available for practice; a Dowd harpsichord, a Hubbard harpsichord, and replicas of a Stein fortepiano and a Graf fortepiano are reserved for advanced students and concerts. Among the recital pianos available for use are Steinway and Mason & Hamlin concert grands and a Boult Pedlars Imperial. There is an American-Skinner organ in Sage Chapel, a Schlicker organ at Barnes Hall, and a Helmuth Wolf organ in Anatole Taylor Chapel. A studio for electronic music is housed in Lincoln Hall.

Freshman Seminars

111 Sound, Sense, and Ideas Fall or spring. 3 credits. Each student studies a prerequisite: students do not need to have studied music. May not be counted for the distribution requirement in the expressive arts.

112 Introductory Courses

101 The Art of Music Fall. 3 credits. T R 11:15; 1-disc hour to be arranged. W W. Austin.

Explorations, chiefly through study of phonograph records, designed to speed up the continuous development of various independent tastes. Each student chooses individually what to study from among diverse styles of music, instructors help refine these choices through the term, everyone studies a few assigned works, especially by J. S. Bach, Ludwig van Beethoven, and Béla Bartók, to provide a common focus for tracing and discussing historical continuities and changes. Diversity is represented in the lectures by live performances as well as records. The lectures are oriented to survey melody, rhythms, chords, and musical forms, suggesting ways to study any music—beyond the course as well as within it.

102 History of Music Fall. 2 credits. T R 9:05; 1-disc hour to be arranged. M. Hatch.

The ingredients of music as they present themselves in folk, popular, and art musics, both in the West and in other cultural areas, especially Africa and Southeast Asia. Topics include pitch, scale, rhythm, meter, timbre, and forms of instrumental and vocal play with sound. Listening to and analyzing live and recorded music.

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.

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. Required for Music 152. 151 or equivalent.

Introduction for students expecting to major in music. Intended for students majoring in music and other qualified students. Required for admission to the music major. All students intending 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; 2 disc hours 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 chorale 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. Prerequisite: concurrent enrollment in Music 445 or 446, and permission of instructor. Music 245 is not a prerequisite to 246.

M W 12:30; 3 disc hours to be arranged. M. Hatch.

Readings, listening, and concentrated instruction in the literature, recordings, repertoire, and practices of the Southeast Asian gamelan. Required as an introduction to the content of—drama, dance, literature, and oral poetry—will be studied in their influence on music practice. 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. 2 disc hours to be arranged. 251. J. Feigin; 252, D. R. M. Paterson.

Introduction to counterpoint: free two-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 harmony. Students are expected to write several short pieces in eighteenth- and nineteenth-century styles and forms, such as two-part inventions and minuets scored for string quartet. Continuation of analysis and composition with emphasis on large forms, e.g., sonata form. Ear training, keyboard harmony, figured bass, sight singing, dictation, and score reading.

351 Advanced Tonal Theory Fall. 4 credits. Prerequisite: Music 252 or equivalent. M W F 9:05. Staff.

Inventions, chromatic harmony, analysis of larger forms and nineteenth-century music, ear training, score reading, and advanced keyboard studies, including figured bass.

352 Materials of Twentieth-Century Music Spring. 4 credits. Prerequisite: Music 351. M W F 9:05. W. Austin.

Introduction to some 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 1983–84.]


456 Orchestration Fall. 4 credits. Prerequisite: Music 252 or permission of instructor. T 10:10–12:05. K. Husa.

A study of the instruments of the orchestra and their use in representative works from 1700 to the present. Scoring for various instrumental groups, including large orchestra. Students will occasionally attend rehearsals of Cornell musical organizations and ensembles.


[463 Choral Conducting Spring. 2 credits. Prerequisite: Music 252 or permission of instructor. Not offered 1983–84. F 9:30–10:40. T. A. Sokol.]

[464 Choral Style Spring. 2 credits. Prerequisite: Music 252 or permission of instructor. Not offered 1983–84. F 9:30–10:40. T. A. Sokol.]

Music History

218 Chopin, Chalkovski, Musorgski 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.

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.

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, Chalkovski, Musorgski Spring. 1 credit. Prerequisite: reading knowledge of Russian. Limited to students concurrently enrolled in Music 218.

Seminar to be arranged. For description see Music 218.

[221 Popular Music Spring. 3 credits. No previous formal training in music is required. Not offered 1983–84. M W F 12:10. Staff.]

222 History of Jazz Spring. 3 credits. No previous formal training in music is required.

M W 11:15; 1 disc hour to be arranged. B. Kernfeld.

Lecture course to be devoted to a musical survey of jazz from around 1900 to the 1970s. Sections will emphasize progressive exercises in the fundamental rhythm, harmonic, and tone-coloristic aspects of jazz. Focus: the recorded anthology Smithsonian Collection of Classical Jazz.

274 Opera Fall. 3 credits. M W 12:20. A. Groos, R. Parker, S. Williams.

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, German Literature 374, and Theater Arts 337.)

[277 Baroque Instrumental Music Fall. 3 credits. Prerequisite: Any 3- or 4-credit course in music, or permission of instructor. Not offered 1983–84.]

[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. Not offered 1983–84.]

[282 Music of the Classical Period Fall or spring. every third semester. 3 credits. Prerequisite: any 3- or 4-credit course in music, or permission of instructor. Not offered 1983–84.]

[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. Not offered 1983–84.]

[284 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. Not offered 1983–84.]

[285 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. Not offered 1983–84.]

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) Fall. 4 credits. Not offered 1983–84. D. Randel, E. P. Morris.]

[374 Opera Fall. 4 credits. Prerequisite: Music 152 or equivalent.

M W 12:20 plus 1 disc to be arranged. A. Groos, R. Parker, S. Williams.

The same as Music 274, but with one additional meeting a week devoted to technical discussion of individual works.]

[377 Mozart: His Life, Works, and Times (also German 387) Fall or spring. 4 credits. Not offered 1983–84. N. Zaslav, S. L. Gilman.]

[381 Music of the Baroque Period Fall or spring. every third semester. 4 credits. Prerequisite: Music 152 or equivalent. Not offered 1983–84. M 1:25, W 2:30–4:25. N. Zaslav.]

[382 Music of the Classical Period Fall or spring. every third semester. 4 credits. Prerequisite: Music 152 or equivalent. Fall 1983: M 1:25, W 2:30–4:25. J. Webster. The week devoted to technical discussion of individual works, in place of one hour of 282.]

[383 Music of the Romantic Era Fall or spring. every third semester. 4 credits. Prerequisite: Music 152 or equivalent. M 1:25, W 2:30–4:25. R. Parker. The same as Music 283, but with two hours each week devoted to technical discussion of individual works, in place of one hour of 283.]

[389 The Study of Non-Western Musics Fall or spring. 4 credits. Prerequisite: Music 152 or permission of instructor. Not offered 1983–84. M. Hatch.]


[481 Music In Western Europe to Jozquin des Prez Fall. 4 credits. Prerequisite: Music 381, 382, or 383, or permission of instructor. Not offered 1983–84. T 10:10–11:25. D. Randel.]


Independent Study

301 – 302 Independent Study in Music Fall, 301; spring. Credit to be arranged. Prerequisite: departmental approval. Hours to be arranged. Staff.

The 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-room fees for six hours weekly, without credit, for a room with a piano: $7 for a room without a piano: $45 for use of a pipe organ.

Lessons for credit (Music 321–322): Advanced students, at the sole discretion of the instructor, may earn 2 credits each term for a one-hour lesson (or two half-hour lessons) weekly accompanied by an appropriate practice schedule. The student must have earned, or currently be earning, at least 3 credits in Music courses (not including Freshman Seminars, Music 122, 321–322, 331 through 338, 391–392, or 441 through 450). The fee for a one-hour lesson (or two half-hour lessons) weekly, for credit, during the term is $135. Practice-room fees for twelve hours weekly, $33 per term for a room with a piano; $10 for a room without a piano; $67.50 for use of a pipe organ.

Fees are non-refundable once lessons begin, even if the course is subsequently dropped.

Music majors receive a scholarship equal to the lesson fee listed above. Members of department-sponsored performance ensembles and organizations may, with permission of the director of the organization, receive a scholarship of up to one-half the Cornell fee for the type of lessons chosen during the term. (These scholarships are intended for lessons in the student's primary performing medium.) Under certain conditions students may earn credit for lessons taken outside Cornell (Music 321n–322n). Arrangements must be made through the Department of Music office. Lesson-fee scholarships apply, when awarded, in the same amounts as those for lessons taken at Cornell.

321a–322a Individual Instruction in Voice 321a, fall; 322a, spring; 2 credits each term.

321b–322b Individual Instruction in Organ 321b, fall; 322b, spring; 2 credits each term.

321c–322c Individual Instruction in Piano 321c, fall; 322c, spring; 1–2 credits each term.

321d–322d Individual Instruction in Harpsichord 321d, fall; 322d, spring; 2 credits each term.

321e–322e Individual Instruction in Violin or Viola 321e, fall; 322e, spring; 2 credits each term.

321f–322f Individual Instruction in Cello or Viola da Gamba 321f, fall; 322f, spring; 2 credits each term.

321g–322g Individual Instruction in Bass 321g, fall; 322g, spring; 2 credits each term.

321h–322h Individual Instruction outside Cornell 321h, fall; 322h, spring; 2 credits each term.

322a–g. Prior approval by a member of the faculty in the department is required. For information and a list of approved teachers, consult the department office, 125 Lincoln Hall.

391–392 Advanced Individual Instruction 391, fall; 392, spring; 4 credits each term. Open only to juniors and seniors majoring in music under Option II with concentration in performance and to graduate students. Option II majors whose lessons must be taken outside Cornell may apply to the department for financial assistance towards the cost of lessons. Music 391 is not a prerequisite to 392.

331–332 Sage Chapel Choir 331, fall; 332, spring; 1 credit. No audition for admission.

333–334 Cornell Chorus or Glee Club 333, fall; 334, spring; 1 credit. Prerequisite: permission of instructor.

335–336 Cornell Orchestra 335, fall; 336, spring; 1 credit. Prerequisite: permission of instructor.

337–338 University Bands 337, fall; 338, spring; 1 credit. Prerequisite: permission of instructor.

411–441 Chamber Music Ensemble 411, fall; 441, spring; 1 credit. Prerequisite: permission of instructor.

442–444 Chamber Singers 442, fall; 444, spring; 1 credit. Prerequisite: permission of instructor.

445–446 Cornell Gamelan Ensemble 445, fall; 446, spring; 1 credit. No previous knowledge of music notation or experience in music performance necessary. Attendance at all full rehearsals and one small group lesson per week required for credit.

337–338 University Bands 337, fall; 338, spring; 1 credit.

459–460 Eighteenth-Century Orchestra 1 credit. Prerequisite: permission of instructor. Not offered 1983–84.

601 Introduction to Bibliography and Research Fall. 4 credits. M 1:30–4:25. L. Coral.


669 Debussy to the Present Fall. 4 credits each term. 669. W W F 11:15; 1 disc hour to be arranged.


677 Mozart: His Life, Works, and Times (also German 757) Fall. 4 credits. Not offered 1983–84. N. Zaslav, S. L. Gilman.

680 Introduction to Ethnomusicology Fall. 4 credits. Open to graduate students in anthropology, linguistics, psychology, sociology, and other cognate fields with permission of instructor.

699 Lectures and discussion of Music 369, supplemented by analytical and bibliographical studies appropriate for graduate students. 670. A continuation of Music 669, but with emphasis on analysis of individual works of recent music. No single or systematic analytical method is essayed; rather, each work studied is approached in its own terms, with opportunity to explore a variety of analytical techniques.


677 Mozart: His Life, Works, and Times (also German 757) Fall. 4 credits. Not offered 1983–84. N. Zaslav, S. L. Gilman.

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680 Introduction to Ethnomusicology Fall. 4 credits. Open to graduate students in anthropology, linguistics, psychology, sociology, and other cognate fields with permission of instructor.
The precise sequence and combination of courses chosen to fulfill the major is selected in consultation with the adviser, all majors, however, must satisfy the following requirements (S-U options not allowed):

1) Qualification in one of the languages offered by the department.
2) Eight NES courses (which may include intermediate and advanced language courses).
3) Four courses in subjects related to the student's concentration, which may, in some cases, be taken outside the department.

Prospective majors should discuss their plans with the director of underclassmen, before enrolling in the department. To qualify as a major, a cumulative grade average of C or better is required.

**Study abroad**

Near Eastern studies majors may choose to study in the Near East in their junior year. There are various academic programs in Israel and Egypt that are recognized by the Department of Near Eastern Studies and that allow for the transfer of credits.

**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 the curriculum. 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, p. 210.

**Freshman Seminars**

[125 Freshman Seminar in Biblical Literature: Heroes and Heroines of the Bible  Fall 3 credits. Not offered 1983–84.]

**Arabs**

Arabs through a prism of Western bias and prejudice. Arabs see themselves as heirs to, and bearers of, a glorious cultural tradition, but they also see themselves as nationally fragmented and politically, economically, and philosophically unable to control their own destinies. Why? Our seminar explores the "Arab predicament" through the writings of major Arab authors. Reading them we may become more sensitive to another people and to our own modes of understanding the world.

**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.

Sec. 1, M–F 9–10:30; Sec. 2, M–F 10:30–12; Sec. 3, M–F 12:30–1:30. N. Scharf.

Intended for beginners (section 1 for students without any previous background). A thorough grounding is given in all the language skills, emphasizing reading, writing, grammar, listening, and speaking.

103 Elementary Modern Hebrew: Second Semester  Summer. 4 credits. Prerequisite: one semester of college Hebrew or permission of instructor.


Fundamentals of grammar, syntax, and vocabulary as applied to both conversation and written Hebrew in the modern idiom. Satisfactory completion of this course and a passing grade on a special section of the final examination fulfills the qualification portion of the language requirement.

[111–112 Elementary Arabic 111, fall; 112, spring. 6 credits each term. Prerequisite for NES 112: 111 or permission of instructor. Not offered 1983–84.]

121–122 Elementary Classical Hebrew 121, fall; 122, spring. 4 credits each term. Prerequisite for NES 122: 121 or equivalent with permission of instructor.

M W F 2:30. Staff.

An introduction to Biblical Hebrew that focuses on acquisition of basic language structures and vocabulary and on fluency in reading and translating. In the second term, readings include the Book of Ruth and selections from the Book of Genesis. This course provides the basis for understanding the role of Biblical Hebrew in shaping Modern Hebrew and for the study of the historical development of the Hebrew language.

[131–132 Introduction to the Turkish Language (also Turkish 131–132) 131, fall; 132, spring. 3 credits each term. Not offered 1983–84.]

[171–172 Elementary Yiddish 171, fall; 172, spring. 4 credits each term. Not offered 1983–84.]

183–184 A Self-instructional Language Course for Beginners: Elementary Persian 183, fall; 184, spring. 6 credits each term. No prerequisites.

Staff. (Contact P. Molan for information.) Students work on their own for five hours per week and with a native informant for two hours of drill per week. Tests are periodically administered by faculty-level examiners. The goal is to achieve a sound grounding in all language skills, but a high level of self-motivation and discipline is required. The course is offered only if there is sufficient enrollment.

201–202 Intermediate Modern Hebrew I and II 201, fall; 202, spring. 3 credits each term.

Prerequisite for NES 202. 201 or permission of instructor. Satisfactory completion of NES 202 fulfills the proficiency portion of the language requirement.

M W F 12:30. N. Scharf.
Second-year modern Hebrew. Continued development of reading, writing, composition, listening, and speaking skills.

211-212 Intermediate Arabic 211, fall, 212, spring. 3 credits each term. Prerequisite for NES 211: one year of Arabic or permission of instructor. Prerequisite for NES 212: 211 or permission of instructor. Fall: M W F 9:05, P. D. Molan. Spring: T R 10:10, D. S. Powers. The basic structures of literary Arabic are reviewed and reinforced. An appreciation for syntax will be developed through readings in classical and modern texts.

213 Introduction to Egyptian Arabic and to Problems of Arabic Dialectology Fall 6 credits No prerequisites. All texts in Roman alphabet. M-F 10-10:15, 10:45-12. D. I. Owen. Students learn the basic structures of Egyptian spoken Arabic, probably the most widely known of Arabic dialects and a major vehicle for popular Arabic culture. One hour per week will be devoted to the history and development of the Arabic language with special reference to the problem of the relationship between "classical" and dialectal Arabic. The impact of European languages on modern Arabic will be assessed and some comparisons with modern Hebrew will be drawn.

[238 Aramaic Spring. 3 credits. Not offered 1983–84 ]

301–302 Advanced Modern Hebrew I and II 301, fall; 302, spring. 4 credits each term. Entire sequence may be repeated for credit. Prerequisite for NES 301: 202 or equivalent with permission of instructor. Prerequisite for NES 302: 301 or equivalent with permission of instructor. This sequence may be used as a literature to fulfill the humanities distribution requirement. Material varies from one year to the next. TR 10:10–11:25, C. Kronfeld. Advanced study of Hebrew through the analysis of literary texts and expository prose. This course employs a double perspective: the language is viewed through the literature and the literature through the language. Students will develop composition skills by studying language structures, idioms, and various registers of style.

[311 Advanced Arabic: The Short Story Fall. 4 credits. Prerequisite: NES 212 or permission of instructor. Not offered 1983–84 ]

[312 Advanced Arabic: Qur’an and Tefafir Spring. 4 credits. Not offered 1983–84 ]

333–334 Elementary Akkadian 333, fall; 334, spring. 4 credits each term. Hours to be arranged. Staff. An introduction to the Semitic language of the Akkadians and Babylonians of ancient Mesopotamia. Utilizing the inductive method, students are rapidly introduced to the grammar and the cuneiform writing system of Akkadian through selected readings in the Code of Hammurapi, the Descent of Ishtar, and the Argument of Sumer and Akkad. Secondary readings on the history and culture of Mesopotamia provide the background for the study of the language. Knowledge of another Semitic language helpful but not essential.

[335–336 Readings in Akkadian Texts 335, fall; 336, spring. 3 credits. Prerequisite: NES 333–334. Hours to be arranged. D. I. Owen. Selected readings in Akkadian texts.

[337 Ugaritic Fall. 3 credits. Not offered 1983–84 ]

Archaeology

[243 The History and Archaeology of Ancient Israel to 450 B.C.E. Spring. 4 credits. Not offered 1983–84 ]

261 Ancient Seafaring (also Archaeology 275) Summer, 3 credits. M-F 9–10:15, 10:45–12. D. I. Owen. Surveys the history and development of archaeology under the sea. Focuses on the role of nautical technology and seafaring and the development of the sailing ship at the maritime peoples of the ancient Mediterranean world and the riverine cultures of Egypt, Mesopotamia, and the Indus Valley. Archaeological and literary evidence for maritime trade, economics, exploration, and colonization as well as the role of the sea in religion and mythology is discussed.

[262 Mediterranean Archaeology (also Classics 200) Fall. 3 credits. Not offered 1983–84 ]

[263 Introduction to Biblical Archaeology Summer. 3 credits. Not offered 1983–84 ]

[361 Interconnections in the Eastern Mediterranean World In Antiquity Fall. 4 credits. Not offered 1983–84.]

262 The History and Archaeology of Ebla Spring. 4 credits. Prerequisite: Archaeology 100 or any introductory course in ancient history or archaeology. T R 12:20–1:35, D. I. Owen. A detailed survey of the history and archaeology of the newly discovered civilization of Ebla, based on the latest archaeological and textual publications. The position of Ebla in the history and archaeology of the third millennium as a bridge between Mesopotamia and Egypt will be emphasized. Significant texts in Eblaite and Sumerian will be read in translation.

364 Introduction to Field Archaeology in Israel Summer, 6 credits. D. I. Owen. An introduction to archaeological fieldwork—excavation techniques, pottery analysis, and recording. Materials studied will range from the early Bronze Age to the Roman period. Emphasis also on the role archaeology plays in the reconstruction of biblical history and the various approaches used to achieve that reconstruction. On-site supervision will be supplemented by regular lectures on the history, culture, and literature of the peoples whose remains will be exposed. Requirements include regularly assigned readings and two papers. Graduate credit by special arrangement.

365 The History and Archaeology of the Divided Monarchy from the Death of Solomon to the Destruction of Jerusalem, 922–586 B.C.E. Fall. 4 credits. D. I. Owen. The political history of the monarchies of Israel and Judah is one of the best-documented periods in the history of ancient Israel. This course will examine in detail the complex textual and external archaeological evidence for this period, focusing on the political, cultural, and religious rivalries that beset Israel and Judah within the context of their respective relationships with the Phoenicians, Egyptians, Assyrians, and Babylonians.

366 The History and Archaeology of the Ancient Near East (also Archaeology 310) Fall. 4 credits. Prerequisite: Archaeology 100 or permission of instructor. T R 12:20–1:35, D. I. Owen. A survey of the history and archaeology of the major civilizations of the Near East from the Persian Gulf to Syria and covering the time span from the prehistoric period to the Persian conquest. Sumerian, Akkadian, Elamite, Eblaite, West Semitic, Assyrian, Babylonian, and Persian cultures will be discussed with emphasis on indigenous development as well as cross-cultural contacts.

[377 The History and Archaeology of Ancient Egypt Fall. 4 credits. Not offered 1983–84 ]

[461 Seminar in Syro-Palestinian Archaeology: The Israelite Conquest of Canaan Fall. 4 credits. Not offered 1983–84 ]

History

[151 Islamic Civilization Fall. 3 credits. Not offered 1983–84 ]

[152 Islam in the Modern World Spring. 3 credits. Not offered 1983–84 ]

241 The Holocaust: European Jewry, 1933–45 Summer. 3 credits. M-F 1:30–2:35, G. Kornan. An examination of the process of European Jewry 1933–45, focusing on the dynamics of European and Nazi anti-Semitism as well as on the character of the European Jewish community. Topics include regional variations in policy toward Jews in Nazi-occupied Europe, the Allied response, Jewish resistance, and the Jewish Councils. Readings of primary sources in English translation are stressed.

[243 History of Ancient Israel to 450 B.C.E. Spring. 4 credits. Not offered 1983–84 ]

[245 The Emergence of the Modern Jew, 1648–1948 Spring. 4 credits. Not offered 1983–84 ]

[252 Islamic Law and Society Spring. 3 credits. Not offered 1983–84 ]

[258 Islamic History 600–1050 Spring. 3 credits. Not offered 1983–84 ]

261 Ancient Seafaring (also Archaeology 275) For description see under Near Eastern Archaeology, above.

294 Modern History of the Middle East: Changing Politics, Society, and Ideas (also Government 358) Fall. 4 credits. Fall: M W F 1:25, summer: M–F 1–2:25, U. Dann. An introduction to the history of Turkey, the Arab lands, Israel, and Iran since the beginnings of modernization at the end of the eighteenth century to the present. The main focus is on the clash between traditional society and the West, and the changing social patterns, political systems, and ideologies in this context.

[343 The Jewish Community throughout History Spring. 4 credits. Not offered 1983–84 ]

346 Jews of Arab Lands Spring. 3 credits. W 25–3:25, D. S. Powers. The continuing conflict in the Middle East has made the topic of the historical relations between Jews and Arabs one of urgent significance. The present course seeks to explore the nature of the Jewish experience under Arab rule from the advent of Islam and the Arab conquests (when the majority of world Jewry came under Muslim rule), through the flourishing of Jewish culture during the Islamic High Middle Ages, to the decay of the Muslim world and the rise of the West. Topics to be considered will include the contribution of Judaism to the formation of Islamic civilization; the social, economic, and legal status of Jews living in Arab countries; Judaism-Islamic culture; and mutual perceptions of Arabs and Jews in modern times.

[361 Interconnections in the Eastern Mediterranean World in Antiquity Fall. 4 credits. Not offered 1983–84 ]

362 The History and Archaeology of Ebla Spring. 4 credits. Prerequisite: Archaeology 100 or any introductory course in ancient history or archaeology. T R 12:20–1:35, D. I. Owen. A detailed survey of the history and archaeology of the newly discovered civilization of Ebla, based on the latest archaeological and textual publications. The position of Ebla in the history and archaeology of the third millennium as a bridge between Mesopotamia and Egypt will be emphasized. Significant texts in Eblaite and Sumerian will be read in translation.

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366 The History and Archaeology of the Ancient Near East (also Archaeology 310) Fall. 4 credits. Prerequisite: Archaeology 100 or permission of instructor. T R 12:20–1:35, D. I. Owen. A survey of the history and archaeology of the major civilizations of the Near East from the Persian Gulf to Syria and covering the time span from the prehistoric period to the Persian conquest. Sumerian, Akkadian, Elamite, Eblaite, West Semitic, Assyrian, Babylonian, and Persian cultures will be discussed with emphasis on indigenous development as well as cross-cultural contacts.

[377 The History and Archaeology of Ancient Egypt Fall. 4 credits. Not offered 1983–84 ]
### Literature

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>205</td>
<td>Masterpieces of Jewish Literature (also Comparative Literature 205)</td>
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<tr>
<td></td>
<td>4 credits. No prerequisites.</td>
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<tr>
<td></td>
<td>T 2:30 – 5. C. Kronfeld. A reading of the major works of Hebrew and Yiddish literature in English translation, as well as a selection from Sephardi literature in Jewish languages such as Ladino and Judeo-Arabic. The course combines a historical and a comparative perspective and offers both a close reading of the literary works and an examination of the context in which they were produced. Readings span a variety of genres and periods from the Bible to Agnon and Amichai, from Mendele and Sholem Aleichem to Manger and Bashevis-Singer. Students will have the option of reading the texts in the original Hebrew and/or Yiddish.</td>
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<tr>
<td>207</td>
<td>Modern Hebrew Literature in Translation: Modern Hebrew Poetry</td>
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<td></td>
<td>Fall. 3 credits. Open to freshmen. Not offered 1983–84.</td>
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<tr>
<td>208</td>
<td>Modern Hebrew Literature in Translation: The Modern Hebrew Short Story</td>
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<td>Spring. 3 credits Open to freshmen. Not offered 1983–84.</td>
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<tr>
<td>221–222</td>
<td>Readings in Classical Hebrew Literature: The Art of Biblical Narrative</td>
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<td></td>
<td>221, fall, 222, spring. 3 credits each term. Not offered 1983–84.</td>
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<tr>
<td>225</td>
<td>Judaic Literature in Late Antiquity: Dead Sea Scrolls and Sectarian Literature</td>
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<td>Spring. 3 credits. Not offered 1983–84.</td>
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<tr>
<td>251</td>
<td>Studies in the Popular and Courtly Literatures of the Islamic Middle East</td>
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<td></td>
<td>Fall. 3 credits. Not offered 1983–84.</td>
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<tr>
<td>254</td>
<td>Society, Politics, and the Modern Arabic Novel</td>
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<td>Fall. 3 credits. Not offered 1983–84.</td>
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<tr>
<td>256</td>
<td>The Arabian Nights In the East and the West</td>
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<td>Spring. 3 credits. Not offered 1983–84.</td>
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<tr>
<td>291</td>
<td>Tradition and the Literary Imagination</td>
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<td>Fall. 3 credits. Not offered 1983–84.</td>
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<tr>
<td>292</td>
<td>The Hebrew Literary Imagination</td>
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<td>Spring. 3 credits. Not offered 1983–84.</td>
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<tr>
<td>303</td>
<td>Seminar in Modern Hebrew Literature: The Short Story</td>
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<td>Fall. 4 credits. Not offered 1983–84.</td>
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<td>304</td>
<td>Seminar in Modern Hebrew Literature: The Novel</td>
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<td>Spring. 4 credits. Not offered 1983–84.</td>
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<tr>
<td>308</td>
<td>Agnon and Hazaz</td>
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<tr>
<td>322</td>
<td>Undergraduate Seminar in Biblical Literature: Prophecy in Ancient Israel</td>
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<td></td>
<td>Spring. 4 credits. Prerequisite: one course in Bible or literature. Not offered 1983–84.</td>
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<tr>
<td>332</td>
<td>Ancient Near Eastern Literature</td>
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<td></td>
<td>Spring. 4 credits. T R 2:30–3:45. D. I. Owen. Readings in translation from major and minor literary works of the Sumerians, Egyptians, Akkadians, Babylonians, Hittites, Canaanites, Hebrews, and Egyptians. Selections from epical, religious, magical, and historical genres. Discussion of epic themes, mythological systems, and a comparison of literary and mythological motifs with later biblical and Greek literature.</td>
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### Special Topics and Independent Study

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>341–342</td>
<td>Special Topics in Near Eastern Studies 4 credits. Limited to 25 students; preference will be determined by class standing and prior enrollment in Near Eastern Studies. Himans hours to be arranged. Staff. An examination of especially significant subjects in the field of Near Eastern studies. The course will be taught by one or more members of the department, enriched by visiting lecturers, and usually require a tutorial relationship between participating faculty members and one to five students.</td>
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### Independent Studies

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<tr>
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<tbody>
<tr>
<td>491–492</td>
<td>Independent Study, Undergraduate Level fall or spring. Variable credit. Prerequisite: permission of instructor.</td>
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<tr>
<td>691–692</td>
<td>Independent Study, Graduate Level fall or spring. Variable credit. Prerequisite: permission of instructor.</td>
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</tbody>
</table>

### Related Courses in Other Departments

<table>
<thead>
<tr>
<th>Department</th>
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<tbody>
<tr>
<td>Archaeology</td>
<td>Freshman Seminar in Classical Archaeology (Classics 121)</td>
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<td></td>
<td>Introduction to Classical Archaeology (Classics 220)</td>
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<td></td>
<td>Introduction to Classical Archaeology (Art History 220)</td>
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<tr>
<td>Aegean Dendrochronology (Classics 309)</td>
<td>[The Archaeology of Cyprus (Classics 321) Not offered 1983–84.</td>
</tr>
<tr>
<td>[Problems in Minoan-Mycenaean Archaeology (Classics 629)</td>
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<tr>
<td>Comparative Economics (Economics 368) Spring.</td>
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<tr>
<td>Government and Politics of the Soviet Union (Government 333)</td>
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### Special Topics in Near Eastern Studies

<table>
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<tr>
<td>307</td>
<td>Special Topics in Near Eastern Studies 4 credits. Limited to 25 students; preference will be determined by class standing and prior enrollment in Near Eastern Studies. Himans hours to be arranged. Staff. An examination of especially significant subjects in the field of Near Eastern studies. The course will be taught by one or more members of the department, enriched by visiting lecturers, and usually require a tutorial relationship between participating faculty members and one to five students.</td>
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### Near Eastern Studies 175

- Archaeology
- Special Topics and Independent Study
- Independent Studies
- Related Courses in Other Departments
they provide ample opportunity for discussion.

Students who want a broad introduction to philosophy may take Philosophy 101, Philosophical Classics, which focuses on recognized classics in the principal areas of philosophy. Philosophy 101, Logic, Evidence and Argument, deals with the analysis and evaluation of arguments of all sorts. It is not a general introduction to philosophy, but the skills it develops are useful in all areas of study, including philosophy. Many students with special interests find that a brief 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 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, at least one course in the history of philosophy other than ancient philosophy, and a minimum of three courses numbered above 300, at least one of which must be numbered above 400 (with the exception of 490).

A course in mathematical logic (either Philosophy 231 or 331), while not required, is strongly 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 aides, working with faculty members familiar with their work.

Honors. A candidate for honors in philosophy must be a philosophy major with a B- or better for all work in the College of Arts and Sciences and an average of B or better for all work in philosophy. In either or both terms of the senior year a candidate for honors enrolls in Philosophy 490 and undertakes research leading to the writing of an honors essay by the end of the final term. Prospective candidates should apply at the Department of Philosophy 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. 3 credits. Limited to freshmen who have not taken Philosophy 101. Independent sections, each limited to 18 students. Letter grade only.

Fall: M W F 9:05, staff; M W F 11:15, R. Stainaker; M W F 12:20, 1:25, or 2:30, staff; T R 10:10, C. Ginet; T R 12:20-1:35, N. L. Sturgeon, A. W. Wood

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 (twenty students at most), they provide ample opportunity for discussion. Students who want a broad introduction to philosophy may take Philosophy 101, Philosophical Classics, which focuses on recognized classics in the principal areas of philosophy. Philosophy 101, Logic, Evidence and Argument, deals with the analysis and evaluation of arguments of all sorts. It is not a general introduction to philosophy, but the skills it develops are useful in all areas of study, including philosophy. Many students with special interests find that a brief 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.

201 Philosophy Problems Spring. 4 credits. Not offered 1983–84.

211 Ancient Philosophy Fall. 4 credits. No prerequisites.

TR 12:20–1:35, G. Fine

A survey of the central theories of ancient Greek and Roman philosophical thought from its beginnings with the pre-Socratics through its development in Socrates, Plato, and Aristotle, and the Stoics, Epicureans, and Sceptics. Topics to be considered include knowledge and reality, the nature of the cosmos; happiness, justice, and the function of man.

212 Modern Philosophy Spring. 4 credits.

TR 12:20–1:35, G. Fine

A survey of some major philosophical problems in the rationalists, empiricists, and Kant. Typical problems include the nature and limits of knowledge, perception; the existence of God; free will and determinism; mind and body. Readings from Descartes, Spinoza, Locke, Berkeley, Hume, and Kant.

213 Existentialism Not offered 1983–84.


215 Medieval Philosophy Not offered 1983–84.

231 Formal Logic Spring. 4 credits.

MWF 11:15, 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 for students unsure of their mathematical aptitude or without mathematical background.)

241 Ethics Fall 4 credits.

MWF 10:10, D. Lyons

Introduction to the philosophical study of moral problems and ethical theories through both historical and contemporary sources. Topics typically include relativism and scepticism, egoism and utilitarianism, and one or more specific moral issues such as the enforcement of morals and obedience to law.

242 Social and Political Theory Fall. 4 credits.

MWF 12:20, J. Bennett

A historical survey of philosophical thinking about the nature and norms of human society, including such questions as the nature and limits of liberty, the function and justification of state authority, the origins of inequality, and the rationale for revolution. Classic works in social and political theory will be discussed in detail in an effort to analyze their main arguments, determining the views of psychology, society, and ethics on which they rest.


244 Philosophy and Literature Spring. 4 credits.

MWF 12:20, T. H. Irwin

What can literature contribute to the understanding of philosophical issues, and what can philosophy contribute to the understanding of literature? Issues to be discussed include morality, self and others; egoism and altruism; character and freedom; duty and inclination; utilitarianism and personal integrity. Readings include Sophocles’ Antigone, Ajax, Philoctetes; Ekel’s Mill on the Floss, Middlemarch, Tolstoy’s Anna Karenina, Dickens’ Hard Times.

245 Biomedical Ethics (also Biological Sciences 205) Fall. 3 credits. Limited to 100 students.

Primarily for sophomores, juniors, and seniors; permission of instructor required for graduate students.

MWF 12:20, C. Hughes

Critical analysis 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 infanticide; euthanasia and suicide; the allocation of scarce medical resources; physician-patient relationships; and health care systems.
consciousness? Is there a conflict between free will and determinism? Can thoughts and feelings be explained in terms of the brain's physical processes? What is the nature of free will? Is it possible to have free will in a deterministic universe?

An examination of attempts in the biological and social sciences to offer scientific theories of human nature and human potential and to apply such theories to explain important social and psychological phenomena. Topics vary and may include issues in psychology such as behaviorism, Freudianism, and artificial intelligence or issues in the foundations of historical theory, such as methodological individualism and economic determinism, as well as relevant issues in the biological sciences. Topic for 1983–84: Darwin, social Darwinism, and sociobiology.

Intermediate Courses

Some of these courses have prerequisites.

309 Plato Fall. 4 credits. Prerequisite: At least one previous course in philosophy or permission of instructor.
   TR 2:30. G. Fine.
   A systematic survey of Plato's thought, from his earlier dialogues through the Republic and his later dialogues. Topics to be considered include knowledge and reality, the Theory of Forms; the nature of the soul, justice, and happiness. No knowledge of Greek or of Greek philosophy is presupposed.

310 Aristotle Spring. 4 credits. Prerequisites: At least one previous course in philosophy, or permission of instructor.
   TR 2:30. G. Fine.
   A systematic survey of Aristotle's thought, primarily in metaphysics. Topics to be considered include substance, forms, matter, essence and necessity, actuality and potentiality, explanation, teleology and functionalism. Special attention will be given to the Organon, Physics, and Metaphysics. No knowledge of Greek or of Greek philosophy is presupposed.

311 Modern Rationalism Spring. 4 credits.
   MWF 2:30. C. Ginzel.

312 Modern Empiricism Fall. 4 credits.
   MWF 9:05. N. Stalnaker.
   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.

313 Topics in Ancient Philosophy Not offered 1983–84.

315 Special Topics in the History of Philosophy Not offered 1983–84.

316 Kant Spring. 4 credits.
   MWF 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 and the basis of empirical knowledge; the nature of space and time and our knowledge of them; the proof of the existence of an objective world (has Kant answered scepticism?); why events must have causes, and how we know they must have them, scientific law, determinism, and the possibility of free will; free will, reason, and the basis of morality.

317 Hegel Not offered 1983–84.

318 Twentieth-Century Philosophy Spring. 4 credits.
   MWF 1:15. S. Shoemaker.

319 Philosophy of Marx Not offered 1983–84.

321 Introduction to Formal Logic Fall. 4 credits.
   MWF 11:15. H. Hodes.
   Sentential logic and first-order quantification theory. Covers the same material as Philosophy 231 but in more depth and with additional metatheory. This is the recommended course, of the two, for students with good mathematical background or aptitude.

322 Semantics Fall. 4 credits. Prerequisite: at least one philosophy course, some background in logic.
   MWF 1:25. R. Stalnaker.
   Introduction to the philosophy of language. Discussion of the nature of representation and communication, alternative conceptions of meaning, the analysis of speech acts, and the relation between logic and natural language.

324 Law, Society, and Morality (also Law 666) Spring. 4 credits.
   MWF 2:30. J. Bennett.
   An introduction to legal philosophy, concentrating on the nature of law. Law has been conceived as divine command, as command of an earthly sovereign, as exercise of power by the state, as rule-governed social behavior, and as the process of discovering the moral relations between citizens. The course looks at these views as expressed in the writings of Thomas Aquinas, Jeremy Bentham, John Austin, John Gray, Oliver Wendell Holmes, H. L. A. Hart, and Ronald Dworkin.

341 Ethical Theory Not offered 1983–84.

342 Law, Society, and Morality (also Law 666) Spring. 4 credits.
   MWF 2:30. J. Bennett.
   An introduction to legal philosophy, concentrating on the nature of law. Law has been conceived as divine command, as command of an earthly sovereign, as exercise of power by the state, as rule-governed social behavior, and as the process of discovering the moral relations between citizens. The course looks at these views as expressed in the writings of Thomas Aquinas, Jeremy Bentham, John Austin, John Gray, Oliver Wendell Holmes, H. L. A. Hart, and Ronald Dworkin.

341 Ethical Theory Not offered 1983–84.

342 Law, Society, and Morality (also Law 666) Spring. 4 credits.
   MWF 2:30. J. Bennett.
   An introduction to legal philosophy, concentrating on the nature of law. Law has been conceived as divine command, as command of an earthly sovereign, as exercise of power by the state, as rule-governed social behavior, and as the process of discovering the moral relations between citizens. The course looks at these views as expressed in the writings of Thomas Aquinas, Jeremy Bentham, John Austin, John Gray, Oliver Wendell Holmes, H. L. A. Hart, and Ronald Dworkin.

344 Contemporary Legal Theory (also Law 720) Not offered 1983–84.

344 Contemporary Legal Theory (also Law 720) Not offered 1983–84.

346 Intensional Logic Spring. 4 credits.
   Prerequisite: Philosophy 231 or equivalent.
   MWF 1:25. R. Stalnaker.
   Formal semantics for, and philosophical applications of, various modal and intensional logic.

347 Problems in the Philosophy of Language Not offered 1983–84.

411 Contemporary Ethical Theory Fall. 4 credits.
   MWF 2:30. N. Sturgeon.

442 Ethics and the Philosophy of Mind Not offered 1983–84.

443 Philosophy of Logic Not offered 1983–84.

444 Contemporary Aesthetics Not offered 1983–84.


446 Topics in Social and Political Philosophy Spring. 4 credits.
   TR 1. J. Bennett.

461 Metaphysics Spring. 4 credits.
   MWF 3:45. C. Hughes.
   Topic for 1983–84: Philosophy of Christianity.
462 Theory of Knowledge Fall 4 credits
T R 1 S. Shoemaker
Topic for 1983–84: The Self. An examination of
philosophical problems about self-consciousness,
self-reference, and the nature of mind.
[481 Problems in the Philosophy of Science Not offered 1983–84]

490 Special Studies in Philosophy Fall or spring.
4 credits each term. Open only to honors students
in their senior year. Start.

611 Ancient Philosophy Fall. 4 credits.
M 3:45–5:40. T. Irwin
Topic for 1983–84: Aristotle and Stoicism. Topics
include categories, language and ontology, natural
law and teleology, causation and free will, mind
and body; morality and happiness.
[512 Medieval Philosophy Not offered 1983–84]

[513 Modern Philosophers Not offered 1983–84]

519 History of Philosophy Not offered 1983–
84.]

[631 Logic Not offered 1983–84]

633 Philosophy of Language Spring. 4 credits.
R 3:45–5:40. H. Hodes.
This seminar will be on various contemporary
approaches to the theory of linguistic meaning.
Topics will probably include semantic paradoxes;
Tarski’s definition of truth; Davidson’s program for
basing a theory of meaning on a theory of truth; the
Fregean notion of sense; Dummett’s criticism of
Tarski’s definition of truth; Davidson’s program for
theories of linguistic meaning.

The Aristotelian Tradition in the Middle Ages (Society for the Humanities 418) Spring.
J. Murdoch.

Grammar in the Middle Ages (Society for the
Humanities 420) Spring.
C. Brouseau.

The Rhetoric of Justice (Society for the
Humanities 427–428) Fall or spring.
J. Kofler.

Physics
D. F. Holcomb, chairman and director of
undergraduate studies (109 Clark Hall, 256-7561).
V. Ambegaokar, N. W. Ashcroft, K. Berkelman,
H. A. Bethe (emeritus), D. G. Cassel, G. V. Chester,
B. Cooper, R. M. Cotts, J. W. DeWeire,
M. J. Feigenbaum, M. E. Fisher, D. B. Flitchen,
C. P. Franck, R. Galik, M. Glichriese, B. Gittelman,
K. Gottfried, S. Gregory, K. Greisen, L. N. Hand,
D. L. Hartill, W. Ho, T. Kinoshiba, J. A. Krumhansl,
D. M. Lee, O. P. Lax, R. M. Lidauer,
B. D. McDaniel, N. D. Mennin, J. Orear, R. O. Pohl,
J. D. Reppy, R. C. Richardson, E. E. Salpeter,
R. H. Siemann, A. J. Sievers, E. Siggia, R. H. Silsbee,
A. Shivelman, P. C. Stein, R. M. Talman,
S. A. Teukolsky, M. Tigner, J. W. Wilkins, K. G. Wilson,
T. M. Yan, D. Yennie.
The Department of Physics offers a full range of
undergraduate-level work in physics, from general
education courses for nonscience majors 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
operates large research efforts in condensed-matter physics
and in low-temperature physics. LNS operates a major high-energy particle
physics research facility at Wilson Laboratory, the
Cornell electron-positron storage ring, called CESR.

Theoretical work is carried out in many fields of
physics, including astrophysics. There is a full
weekly schedule of 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
In addition, there is a cluster of general-
education courses, Physics 200 through 206, and
209. Physics 101–102, a self-paced autotutorial
course, is designed for students who do not intend to
take further physics courses and who do not have
preparation in calculus. Physics 112 and 207 both
require calculus (Mathematics 191 or 111),
and additional mathematics is required for subsequent
courses in sequence. Physics 101–102 or 207–208
may be taken as terminal physics courses. The three-
or four-term sequence 112–213–214–(215) is
recommended for physics majors and engineers.

Courses beyond the introductory level that might be
of interest to nonscience majors 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. Pursuing a physics concentration as
preparation for professional or graduate work
should complete Physics 112–213–214 or 112–
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. In either case, it is
necessary to complete a concurrent sequence of
mathematics courses.

Mathematics 191–192–293–294 are usually
recommended, except for students especially
interested in continuing the study of mathematics, for
whom Mathematics 111–112, 221–222 (or
equivalent) may be preferred.

Prospective majors are urged to make an early
appointment at the physics office for advice in
planning their programs. Acceptance into the major
is normally granted after completion of a year of
physics and mathematics at a satisfactory level; the
student should propose a tentative plan for
completing his or her graduation requirements as
well as those for the major. The plan may change
from time to time, but it must be approved by the
major adviser. The major requirements have two
components—a core and concentration.

Core requirements for the major include:
1) Physics 112–213–214 or 112–217–214 or 207–
208.
2) an intermediate physics course in each of four
areas: (a) mechanics—Physics 315 or 431, (b)
electricity and magnetism—Physics 325 or 432,
(c) modern physics—Physics 315 or 443, and (d)
laboratory physics—Physics 310 (when not taken
as substitute for laboratory work in 214 or 218),
330, 360, or 410.

Mathematics courses prerequisite for these physics
courses are also necessary. The choice of core is
influenced by the intended concentration. For a
concentration in physics, Physics 112–217–218 (or
112–213–214), 315, 318, 325, and any 300-level
laboratory course is appropriate, while for
concentrations outside physics, part (2) of the core
might consist of, for example, Physics 315, 360, 431,
432.

The concentration reflects the student’s interest in
some area related to physics; the array of courses
must have internal coherence and be approved by
the major adviser. The concentration must include
at least 15 credits, with at least 8 credits in courses
numbered above 300. Students have chosen to
concentrate in such closely related disciplines as
astronomy, astrophysics, chemical physics,
astrophysics, geophysics, natural sciences,
history and philosophy of science, computational
physics, or physics with economics or business.
A combined biology-chemistry concentration is
recommended for premedical students or those who
wish to prepare for work in biophysics. The
concentration in natural science is particularly
appropriate for teacher preparation.

The concentration in physics is recommended as
preparation for professional or graduate work in
physics or a closely related discipline. Twelve of the
15 concentration credits must be selected from
physics courses numbered above 300 (in addition to
those selected for part (2) of the core); the program
must include Physics 410. The following courses are
strongly recommended: Physics 443, Mathematics
421, 422, and 423, and at least one of Physics 341,
444, 454; Applied and Engineering Physics 401,
Astronomy 431–432, or Geological Sciences 485.

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.

Distribution Requirement
The requirement in physical sciences is met by any
two sequential courses such as Physics 101–102 or
207–208 or by any two general-education courses
from the group 200–206, 209.
Course Prerequisites

Prerequisites are specified in physics course descriptions to illustrate the materials that students should have mastered. Students who wish to plan a program of study suggested by the prerequisite 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.

Courses

101—102 General Physics 101, fall, except by special permission; 102, spring (may also be offered during summer session). 4 credits each term. Prerequisites: three years of high school mathematics, including trigonometry for Physics 102. Physics 101 or 207. Includes more modern physics and less mathematical analysis than Physics 207—208 or 112—213—214, but more mathematics than Physics 202 to 205. Students planning to major in a physical science should elect Physics 207—208 or 112—213—214. A self-paced, mastery-oriented autotutorial format; students work in a learning center at hours of their own choosing. Repeated tests on each unit are given until mastery is demonstrated.

One large orientation meeting on R. Sept. 1, or T Jan. 24, 7:30 p.m. Start.

Basic concepts treated quantitatively but without calculus. Major topics for 101. Particle structure of matter, kinematics; forces and fields (including electric fields); momentum, angular momentum, energy (including nuclear energy); relatively, sound waves. 102: Electricity and magnetism; optics; thermal physics; quantum physics. Laboratory emphasizes instrumentation, measurement and interpretation of data. Text: Physics for College Students—Applications to the Life Sciences, by Tilley and Thumm.

112 Physics I: Mechanics and Heat Fall or spring (may also be offered during summer session). 4 credits. Primarily for students of engineering and for prospective physics majors. Prerequisite: coregistration in Mathematics 192 (or 194 or 112, or substantial previous contact with introductory calculus, combined with coregistration in Mathematics 191 or 193 or 113).

Lecs. MWF 10:00 or 12:20; 2 recs each week; one 2-hour lab alternate weeks. Evening exams: fall, Oct. 13, Nov. 29; spring, Mar. 1, Apr. 5, Fall. D. Fitchen; spring, R. Littauer.


201—202 Energy: An Introduction to Physics 201, fall; 202, spring. 3 credits. Intended for nonscientists; does not serve as a prerequisite to 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. Richardson; spring, staff.

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 thinking 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.
Projects in Experimental Physics Fall or spring. 1-3 credits. To be supervised by faculty member. Students must advise department coordinator of faculty member responsible for their grade. Prerequisite: Physics 510.

Projects of modern topical interest that involve some independent development work by student. Opportunity for more initiative in experimental work than is possible in Physics 510.

551 Classical Mechanics Fall. 3 credits. Prerequisites: A good knowledge of mechanics at the level of the books by K. Symon or J. B. Marion and familiarity with modern mathematics at the level of Mathematics 515–516.


Classical mechanics, with an introduction to dynamical systems, at the level of VI. Arnold's text, Mathematical Methods of Classical Mechanics. In addition to the standard treatments of Lagrangian methods and rotating systems, periodically forced systems are treated by means of period-1 maps. The various routes of coherence and chaos are integrated with general methods for solving partial differential equations by characteristics. The notions of integrability, ergodicity, and mixing will be covered. Some discussion of Kolmogorov-Arnold-Moser theory will conduct the course. The necessary mathematics of manifolds and differential forms is developed in the course.

553–554 General Relativity (also Astronomy 509–510) Fall. 553, fall; 554, spring, 4 credits. Prerequisite: knowledge of special relativity at the level of Classical Mechanics, by Goldstein. Offered alternate years. Not offered 1983–84.

Fall: lec. T R 1:25–2:40. Spring: lec, T R ]


Maxwell's equations, electromagnetic potentials, electrodynamic of continuous media (selected topics), special relativity, radiation theory. 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.


Thermodynamic ensembles; Legendre transformation. Ergodic and information theory ideas. Ensemble averages and fluctuating functions; equivalences and fluctuations. Indistinguishability. Thermodynamic properties of ideal gases and crystals; Third Law, chemical equilibria. Imperfect gases, correlation functions and their applications. Ideal quantal gases; Bose-Einstein condensation. Ideal paramagnets; ising-models and lattice gases. At the level of Kubo's Statistical Mechanics.

572 Quantum Mechanics I Fall or spring. 4 credits.


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 Lifschitz. Familiarity with elementary aspects of the Schroedinger equation is assumed, including its application to simple systems such as the hydrogen atom.


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.

612 Atomic and Solid-State Physics Fall. 3 credits. Not offered 1983–84. Lectures on techniques and design principles. Examples of topics are signal detection, X-ray and processing, low-temperature techniques and devices. correlation and Fourier transform spectroscopy

614 Experimental High-Energy Physics Spring. 3 credits. Lecs to be arranged. Staff.

Design principles of high-energy apparatus, including beam transport and detection systems, with examples of their applications. Practice in use of relativistic kinematics. Statistical analysis in design and interpretation of experiments.


635 Solid-State Physics I Fall. 3 credits. First semester of a two-semester sequence of solid-state physics for graduate students who have had the equivalent of Physics 572 and 562 and some prior exposure to solid-state physics, such as Physics 454.


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 transport 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.


Introduction to the quantum world of nucleons and mesons. Strong, electromagnetic, and weak interactions. Relevance of symmetry laws to particle physics. Introduction to the quark model. Unification of weak and electromagnetic interactions. At the level of Introduction to High Energy Physics, by Perkins.

646 High-Energy Particle Physics Spring. 3 credits.


Topics of current interest, including hadron electroproduction, electron positron annihilation, and high-energy neutrino interactions. 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.


Relativistic quantum mechanics with emphasis on perturbation techniques. Extensive applications to quantum electrodynamics. Introduction to renormalization theory. At the level of Relativistic Quantum Mechanics, by Bjorken and Drell.

652 Quantum Field Theory Spring. 3 credits.


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 Izykson and Zuber.

653 Statistical Physics Fall. 3 credits. Normally taken by students in their second or later years.

Prerequisites: competence in the basic principles of quantum mechanics, statistical mechanics, and thermodynamics.


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; phenomenological Fermi liquid theory and hydrodynamics; theories of inhomogeneous systems; scaling theories and phase transitions. The contents of the course vary with the current interests of the instructor. There is rarely any set text, though Statistical Physics, by Landau and Lifshitz, or Statistical Mechanics, by Huang, give an idea of the level.

654 Theory of Many-Particle Systems Spring. 3 credits. Prerequisites: Physics 562, 574, 635, 636, and 652.


Equilibrium and transport properties of microscopic systems of many particles studied at zero and finite temperatures. Thermodynamic Green's function techniques introduced and applied to such topics as normal and superconducting Fermi systems, superfluidity, magnetism, insulating crystals.

661 High-Energy Phenomena Fall. 3 credits.


Topics vary at the discretion of the instructor.

655 Topics in Theoretical Astrophysics (also Astronomy 555) Fall. 4 credits. Not offered 1983–84.


Usually concentrates on the theory of the interstellar medium.

667 Theory of Stellar Structure and Evolution (also Astronomy 560) Fall. 4 credits. Usually offered odd calendar years.


Summary of observational facts on stars; dimensional analysis; nuclear reactions and energy transport in stellar interiors; models for static and evolving stars. At the level of Principles of Stellar Energy and Nucleosynthesis, by Clayton.

681–689 Special Topics

Offerings are announced each term. Typical topics are group theory, analyticity in particle physics, weak interactions, superfluids, stellar evolution, plasma physics, cosmic rays, general relativity, low-temperature physics, X-ray spectroscopy or detection, magnetic resonance, phase transitions, and the renormalization group.

690 Independent Study in Physics Fall or spring. Variable credit.

Special graduate study in some branch of physics, either theoretical or experimental, under the direction of any professional member of the staff.
The Major

Requirements 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 brought in during the basic 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 area the basic processes in psychology (laboratory and/or field experience is recommended); and  
2) demonstration of proficiency in statistics through a comprehensive examination in psychology. Students with 30 or more credits of college-level psychology may be designated as part of the biopsychology area other than 123 all have 123 and/ or introductory biology among their prerequisites.

The Major adviser determines to which group, if any, the following courses may be applied:

4) Other courses:

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 term.

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 following ways:

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 325. 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 examination exemption. 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 the biological science can elect to specialize in biopsychology. Students in this concentration must meet all of the general requirements for the major in psychology and must also demonstrate a solid background in introductory biology; the physical sciences, including at least introductory chemistry; and mathematics.

Students will design with their advisers an integrated program of study 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, organic chemistry, biochemistry, organic chemistry, neurobiology, and behavioral biology may be designated as part of the biopsychology 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 Social Psychology. 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 this concentration will be permitted to include in the major courses in psychology 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 this concentration may take advanced seminars, with the permission of the instructor.

Honor. This program is intended to give students an opportunity to examine selected problems in depth and to carry out independent research under the direction of a faculty member. During the spring term of the senior year, an honors student will enroll in Psychology 494 and will develop a proposal and begin work on a research project. The student will arrange a meeting with an honors adviser and a faculty sponsor. At the end of the spring term, a report of the semester's work will be submitted for consideration.

By the fall term of the senior year, honors students will have begun work in their final research projects. They will also enroll in a senior honors seminar, Psychology 498, in which research projects will be discussed. This research will be evaluated with enrollment in Psychology 499. Senior Honors Dissertation. Final honors standing is based on a written thesis and an oral defense of the thesis as well as on general academic performance.

Prospective applicants are advised to file applications early each year in the fall term of their junior year. Students planning this option should discuss it in advance with Professor Gilovich. Sample examination questions are posted outside of 278 Uris Hall.

Distribution Requirement. The distribution requirement in the social sciences is satisfied by any two courses in psychology with the exception of Psychology 123, 322, 324, 328, 350, 361, 396, 422, 425, 451, 471, 472, 473, 476, 477, 478, 481, and 693.

Courses

101 Introduction to Psychology: The Frontiers of Psychological Inquiry Fall. 3 credits. Students who have not received credit for either Psychology 101 and Education 110. Students who would like to take a discussion seminar should also enroll in Psychology 103.

M W F 10-10. J. Maas. The study of human behavior. Topics include brain functioning and mind control, psychophysiology of sleep and dreaming, psychological testing, perception, learning, motivation, personality, abnormal behavior, psychopharmacology, social psychology, and other aspects of applied psychology. Emphasis is on understanding the cognitive processes of normal human functioning and problem solving.

103 Introductory Psychology Seminars Fall. 1 credit. Limited to 400 students. Prerequisites: concurrent enrollment in Psychology 101. Hours to be arranged; 32 different time options.

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. Involved in the discussion of recent research papers on the seminar topic. Choice of seminar topics and meeting times will be available at the second lecture of Psychology 101.

123 Introduction to Psychology: Biopsychology Fall. 3 credits. May 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 Portuguese
An introduction to psychology, emphasizing the development, cross-cultural perspectives, and thinking. Topics include introspective accounts of the concepts underlying the measurement of intelligence and the problems involved in interpreting such measurements 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 the concept of intelligence, reliability and validity of tests, heritability of intelligence, and recent relevant research.

Introduction to Psychology as a Laboratory Science Fall. 3 credits. Prerequisite: one course in psychology normally Psychology 101, 123, or 150. High school credit in psychology may meet this prerequisite with permission of instructor. Not offered 1983–84. Staff.

Perception Fall. 3 credits. Limited to 50 students. Open to first-year students. Not offered 1983–84; next offered 1984–85. T R 12:20–2:15. 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.

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 1983–84. T 12:20, R 12:20–2. Staff. The principles of psychology applied to industrial and business systems; personnel selection; placement and training; problems of people at work, including, evaluation, motivation, efficiency, and fatigue, and the social psychology of the work organization.

Motivation Theory: Contemporary Approaches and Applications Spring. 4 credits. Prerequisite: an introductory psychology course. Not offered 1983–84. M W F 11:15. Staff. Models and research in human motivation are examined and integrated. Traditional approaches are used as departure points for the study of more current themes, such as intrinsic motivation and achievement. Attention is given to how pertinent various themes are to real-life behavioral settings.

Developmental Psychology Spring 4 credits. Prerequisite: an introductory psychology course. T R 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.

Introduction to Cognitive Psychology Spring. 3 credits. Prerequisite: one course in psychology. T R 12:20–1:35. K. Rock. 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. Techniques for investigating problems in these areas are discussed.

Language and Communication Spring. 3 or 4 credits; the 4-credit option involves a term paper or project. Limited to 40 students. Open to first-year students. M W F 1:25. J. Freyd. 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.

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 10:10–11:30; sec. to be arranged. Staff. 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.

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. Not offered 1983–84; next offered 1984–85. T R 2:30–4. S. Bern. The course addresses the question of why and how individual and social contexts come to differ in their overall life styles, work and family roles, personality patterns, cognitive abilities, etc. This broad question is examined from five perspectives: (a) the psychoanalytic perspective, (b) the biological perspective, (c) the social-psychological and contemporaneous perspective. Each of these perspectives is of interest in the way it explains phenomena relating to the psychology of sex roles, including psychological androgyny, women's conflict over achievement, the male sex role, gender, androgyny, androgyny, gender-liberated child-rearing, female sexuality, homosexuality, and transsexualism.

Introduction to Social Psychology (also Sociology 280) Spring. 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 10:10–11:25. T. Gollwitzer. An introduction to research and theory in social psychology. Topics include human processing of social information; social interaction, persuasion, and attitude change; social interaction and group phenomena. The application of social psychological knowledge to current social problems will also be discussed.

Social-Psychological Theories and Applications (also Sociology 284) Fall. 3 credits. Not offered 1983–84. M W F 2:45–3:35. Staff. Emphasis is given to the study of social and psychological reasoning processes which have led to effective social applications of the group. Theoretical perspectives discussed will include the social psychological and/or sociological perspectives on social psychology.

Visual Perception Spring. 3 or 4 credits, depending on whether the student elects to do an independent laboratory project. Prerequisite: Psychology 205 or permission of instructor. Not offered 1983–84; next offered 1984–85. T R 10:10. C. Krumhansl.

Psychology 183 A detailed examination of theories and processes in visual perception. Topics include the perception of color, space, and motion; perceptual constancies; adaptation; pattern perception; and aspects of perceptual learning and development.

Chemosensory Perception Fall or 3 credits; the optional (or fourth) credit is for an independent laboratory project. T R 9:05. B. J. D'aprimon. An examination of basic theory, data, and processes for perception of the chemosensory environment. Students will read, analyze, and discuss difficult original literature in the areas covered. Topics include psychophysical methods for human and nonhuman animals, stimulus control, chemosensory function and development in neonates, role of chemosensory function in food choices, chemosensory communication, effects of pollution of the chemosensory environment, possible consequences of chemosensory dysfunctions, and use of chemosensory systems as neural models.

Perceptual Learning Fall. 3 credits. Prerequisite: Psychology 205, 209, 305, or permission of instructor. Not offered 1983–84.

Development of Perception and Attention Fall. 3 credits. Prerequisite: Psychology 205, 209, 214, 305, or permission of instructor. M W F 10:10. J. Freyd. An ecological view of perceptual development: perception of objects, events, the spatial layout, pictures, and symbols. The level of the course is that of E. J. Gibson, Perceptual Learning and Development.

The Psychology of Reading Spring. 4 credits. Prerequisite: an introductory psychology course or permission of instructor: a course in cognitive psychology is recommended. Hours to be announced. J. Freyd. The course will introduce the major areas of psychological investigation on cognitive processes used in reading. Topics to be covered include the role of eye movements, printed and handwritten letter perception and theories of pattern recognition, alphabets and other writing systems, word perception, context effects in letter and word recognition, psycholinguistic concepts applied to reading, the role of speech in reading, sentence comprehension, spelling, learning to read, dyslexia and other reading disabilities, speed-reading, and text understanding.

Perceptual and Cognitive Processes Fall. 3 credits. Prerequisite: Psychology 205 or 214, or permission of instructor. M W F 9:05. D. Irwin. Survey of research and theory in the area of perceptual and higher mental processes. Emphasis is on the human as an information-processing system. Topics include visual information processing, pattern recognition, cognition, memory, and artificial intelligence.

The Social Psychology of Language Spring. 4 credits. Prerequisite: a course in linguistics or psycholinguistics and in social or personality psychology, or permission of instructor. T R 2:30–4:25. H. Levin. We are aware that one talks differently to children than to adults, to foreigners than to native speakers, to people we like than to those we detest, to people whose intelligence we respect compared to those we think are idiots. Speech varies by social setting, by formality, by other people's role in the conversation, by the relationship between people, by order of presentation, by functional role, by the role of the speaker, by purpose of communication, deception, persuasion, propaganda, etc. What are the rules of social language? How do we acquire the abilities to vary language appropriately and to understand the meanings of such variations? We will attend not only to what is said but to the style of the language: for example, to paralanguage (e.g., intonation, hesitations, etc.) and to the structure (grammar and semantics) of speech.
328 Continuing Fieldwork in Psychopathology and the Helping Relationship. Fall or spring. 2 credits each term. Prerequisite: Psychology 325, 327, and permission of instructor. S-U grades only. May not be taken more than twice. Students are not enrolled in advance for this course. Students in Psychology 327 should inform their teaching assistant before the end of the semester of their desire to take Psychology 328. They must 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 should contact the instructor before the end of the semester of their desire to take Psychology 328. Students who have been fieldwork as part of Psychology 327 to continue their fieldwork placements under supervision and for academic credit. A limited number of students may be allowed to begin their fieldwork with Psychology 328 but only with permission of the instructor.

345 Psychological Research and Afro-American (also African Studies 345) Spring. 4 credits. Prerequisite: one course in introductory psychology or African Studies and Research Center 171. M W F 11:15-12:05, L. Fitzgerald.

In this course we will examine psychological issues that have implications for Afro-Americans. The emphasis of the research topics to be covered will be on the following themes: (1) the assessment of intelligence and personality, (2) cognitive and motivational factors in stereotype and racism, (3) the social and psychological implications of stigmatization. Course requirements include student participation in discussion, an in-class presentation, a midterm paper, and a final group project.

379 Social Cognition Fall. 4 credits. Prerequisite: a course in social psychology or personality, or one in psychology and one course in sociology, or permission of instructor. Not offered 1983–84.

M W F 1:25, L. Melzer.

An intermediate course in social psychology. Attitudes are viewed as emotionally charged beliefs that underlie ideologies, values, interpersonal feelings, and religion. The seminar 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; (2) the balance theory of Fritz Heider and his many derivatives; and (3) the functional theories in psychology (Daniel Katz), cultural anthropology (Marvin Harris). Students will read original source material rather than textbooks.

383 Person Perception and Expression (also Sociology 381) 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 1983–84.

M W F 1:25, L. Melzer.

An intermediate course in social psychology, focusing on people's constructions of others and 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.

385 Theories of Personality (also Sociology 385). Fall. 4 credits. Prerequisite: Psychology 101, 214, or 275, or permission of instructor.

Fall. 1–2:15, 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.

386 Introduction to Sensory Systems (also Biological Sciences 396). Spring. 3 or 4 credits (4 credits with discussion and term paper).

The focus of this course is on experimental research that applies cognitive principles to the study of social psychological phenomena. With an orientation toward examining knowledge structures and cognitive processes underlying person perception and social judgment, the following themes are emphasized: (a) cognitive organization and representation of social information, (b) perceiving the causes of social behavior, and (c) assessing the adequacy of social information processing.
neurophysiology, behavior, and chemistry. S-U grades optional for graduate students only.

M W F 9:05. B. P. Heppner.
The course may 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 the mind which are common across living organisms and those sensory properties that represent adaptations of animals to particular habitats or environments. The principles and limitations of methods used to examine sensory systems will be considered. For spring 1984, general principles of sensory systems, and auditory, visual, and somesthetic systems will be 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 Neurons without Impulses, edited by Roberts and Bush, and Recognition of Complex Acoustic Signals, edited by Bullock.

402 Current Research on Psychopathology
Fall or spring. 2 credits. Prerequisite: Psychology 225.
T R 12:20–2:15; sec to be arranged. K. Keil
Current research and theory on the nature and etiology of schizophrenia, the affective disorders, and psychopathy. Approaches from various disciplines are considered. Minimal attention to psychotherapy.

410 Undergraduate Seminar in Psychology
Fall or spring. 2 credits. Written permission of section instructor required for registration. Nonmajors may be admitted, but psychology majors are given priority.
Hours to be arranged. Staff.
Information on specific sections for each term, including instructor, prerequisites, and time and place may be obtained from the Department of Psychology office, 211 Urs Hall.

411 Memory and Human Nature
Fall. 4 credits.
Limited to 20 students. Prerequisite: several courses in psychology or permission of instructor. Non–psychology majors with backgrounds in literature or anthropology are encouraged to apply.
T R 2:30–4. Staff.
The human activity of remembering is considered from various perspectives: personal, developmental, experimental, cross-cultural, etc. The focus is on the nature and context of memory; laboratory studies are considered when they help clarify ordinary remembering. Specific topics include memory for remote events and childhood; for controversies in the field, there is a focus on how to select appropriate material; for stories and conversations and events: individual, developmental, and cultural differences in remembering and thinking, mnemonics and memarists. Class periods are devoted to seminar discussions.

416 Psychology of Language
Fall. 4 credits.
Prerequisite: Psychology 215 or permission of instructor.
T R 12:20–1:45. F. 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 (comprehension, memory and knowledge, thought and action, communication), and language acquisition.

420 Human Factors
Spring. 4 credits.
Prerequisite: Psychology 205 or 313, or permission of instructor.
M W F 11:15. D. Irwin.
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
Spring. 4 credits.
Prerequisites: a course in introductory biology and a course in biopsychology or neurobiology (such as Psychology 123 or Biological Sciences 221). Not offered 1983–84; next offered 1985.
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 brains are generated, find targets, and establish connections; the emergence of reflexive and complex behavior; how experience affects the developing brain; evolutionary perspectives on the development of perception, memory, and communication systems; and abnormal development.

425 Brain and Behavior
Fall. 3 or 4 credits (4-credit option includes a discussion section and requires an additional paper). Prerequisite: a course in introductory biology and a course in biopsychology or neurobiology (such as Psychology 123 or Biological Sciences 221). Not offered 1983–84; next offered 1984–85.
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, the organization of motor activity, emotion and motivation, psychosurgery, and memory and language.

426 Seminar and Practicum In Psychopathology
Spring. 4 credits. Limited to 16 students.
Prerequisite: Psychology 325; permission of instructor required in all cases. Students should apply to the course during preregistration in fall semester; acceptance will be announced before the end of the fall semester.
T R 2:30–4:25; fieldwork to be arranged. R. Mack.
A seminar and fieldwork course for advanced students who have mastered the fundamental concepts of personality and psychopathology. An opportunity to explore in depth the various forms of psychopathology, etiology, and treatment, to discuss these in seminar; and to work with mental health professionals and those who seek their help. The course includes an exponential component that will be described when applying for the course.

436 Language Development (also Human Development and Family Studies 436)
Spring. 3 or 4 credits. Prerequisite: Cognitive Psychology 215; at least one course in cognitive psychology, cognitive development, or linguistics. Offered in alternate years. Not offered 1983–84; next offered 1984–85.
A survey of basic literature in language development. Major theoretical positions in the field are considered in the light of studies in first-language acquisition of phonology, syntax, and semantics from infancy onward. The fundamental issue of relations between language and cognition will be discussed. The acquisition of communication systems in nonhuman species such as chimps, and problems of language pathology will also be considered; particular emphasis will be on normal language development in the child.

440 Sleep and Dreaming
Spring. 4 credits. Limited to 15 students.
Prerequisite: Psychology 325 or equivalent, and permission of instructor. Not offered 1983–84; next offered 1984–85.
A seminar on the nature of psychotherapy. Issues related to the therapeutic goals, differing views of the nature of man, ethical concerns, and research problems also are considered. Presentations by therapists of differing orientations and experiential and role-play exercises may be an integral part of the seminar experience.

450 Undergraduate Research In Psychology
Fall or spring. 1–4 credits. S-U grades optional. Written 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 the therapeutic goals, differing views of the nature of man, ethical concerns, and research problems also are considered. Presentations by therapists of differing orientations and experiential and role-play exercises may be an integral part of the seminar experience.

451 Quasi Experimentation
Spring, first seven weeks only. 1 credit. Prerequisite: Psychology 350 or equivalent. Offered in odd-numbered years. Not offered 1983–84; next offered 1984–85.
Methods for approximating the rigor of laboratory experiments in field settings.

455 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.
T R 10:10–11:40. Staff.
Mathematical approaches to psychological theory are discussed. Possible topics include choice and decision, signal detectability, measurement theory, scaling, stochastic models, and computer simulation.

467 Seminar: The Examined Self—A Psychohistorical View
Spring. 4 credits.
Prerequisites: 9 credits of psychology including Psychology 325 or equivalent, and permission of instructor for advanced credit enrollment. Not offered 1983–84; next offered 1984–85.
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 1983–84; next offered 1984–85.
The seminar will be devoted to an analysis of insanity as a psychological and historical phenomenon. Selected writings by the mentally ill and their definers will be studied.

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 the therapeutic goals, differing views of the nature of man, ethical concerns, and research problems also are considered. Presentations by therapists of differing orientations and experiential and role-play exercises may be an integral part of the seminar experience.

471 Statistical Methods in Psychology I
Fall. 4 credits.
Prerequisite: Psychology 201 or equivalent, or permission of instructor. Not offered 1983–84; next offered 1984–85.
M W F 11:15. Staff.
Basic probability, descriptive and inferential statistics. Topics include parametric and nonparametric tests of significance, Bayesian inference, correlation, and simple linear regression. The level of the course is that of W. L. Hays, Statistics for Psychologists.
472 Statistical Methods in Psychology II Spring. Limited to 50 students. Prerequisite: Psychology 471 or permission of instructor. 
M W F 1:10-2:05 J. Cunningham. Analysis of variance, experimental design, and related topics. The level of the course is that of G. Keppel, Design and Analysis: A Researcher's Handbook.

473 Statistical Methods in Psychology III Spring. Limited to 50 students. Prerequisite: Psychology 472 or permission of instructor. First day of class, March 12. 
M W F 10-11 J. Cunningham. Multiple regression, at the level of Multiple Regression in Behavioral Research, by F. Kerlinger and E. Pedhazur.

475 Analysis of Nonexperimental Data Fall. Fall. Limited to 20 students. Prerequisite: Psychology 473 or permission of instructor. Not offered 1983—84 T R 10-12. Staff. Factor analysis and other multivariate correlation methods.

476 Representation of Structure in Data Fall. Limited to 20 students. Prerequisite: one year of college mathematics (finite mathematics or calculus) and a course in the social sciences. 
T R 10-11:40 J. Cunningham. Representations of preferences, dominance data, psychological distances, and similarities will be discussed. Topics include unidimensional and multidimensional scaling, unfolding, individual differences scaling, hierarchical clustering, and graph-theoretic analysis.

477 The General Linear Model Fall. Limited to 25 upperclass students. Prerequisite: two courses in psychology or related fields or permission of instructor. 
T R 10-12:05 J. Cunningham. Applications of multiple regression to problems in analysis of variance, analysis of covariance, and nonlinear relationships.

478 Psychometric Theory Fall. Intended for juniors, seniors, and graduate students, majors and nonmajors. Prerequisites: at least three courses in psychology or related fields or permission of instructor. 

479 Multisample Secondary Analysis Fall. Limited to 15 students. Prerequisite: Psychology 473 or permission of instructor. Not offered 1984—85 T R 10-12:05 R. Darlington. Multivariate statistical methods are applied to problems in analysis of variance, analysis of covariance, and nonlinear relationships.

481 Advanced Social Psychology (also Sociology 481) Fall. Limited to 20 students. Prerequisite: a course in social psychology or permission of instructor. 
T R 2-3:45 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, social and cognitive dissonance, attribution processes, interpersonal attraction, and research methods in social psychology.

482 Death and Dying Spring. Limited to 40 juniors and seniors. Prerequisites: 6 credits in psychology or sociology. 
T R 2-3:45 W. Collins. Issues of death and dying in modern American society are explored from the perspectives of psychology, sociology, and the health-related professions. Possible inadequacies in current practice are examined and alternatives discussed.

483 Socialization and Maturity (also Sociology 483) Spring. Limited to 20 students. Prerequisite: one course in psychology, sociology, and anthropology. Prerequisite: two courses in psychology or related fields or permission of instructor. 

486 Interpersonal and Social Stress and Coping (also Sociology 486) Spring. Limited to 15 students. Prerequisite: Psychology 471 or 350 or permission of instructor. 
T R 2:30-3:45 W. W. Lambert. A critical review of work in intrapersonal, interpersonal, situational, and sociocultural sources of stress and the major psychophysiological concomitants of such stress: resultant coping strategies and aids to coping. Data from laboratory, industry, and other cultures will be analyzed.

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.

[502 Professional Writing in Psychology Spring. Limited to 15 students. Prerequisite: permission of instructor. Not offered 1983—84; next offered 1984—85. 
R 2:30—4:25 D. Bamm. A practicum for advanced undergraduate and graduate students in writing reports in psychology and other behavioral and social sciences, with the emphasis on the reporting of empirical research in journal format.]

510—511 Perception

512—514 Visual Perception

513 Learning

515 Motivation

517 Language and Thinking

518 Psycholinguistics

519—520 Cognition

521 Psychobiology

522 Topics in Perception and Cognition

523 Physiological Psychology

525 Mathematical Psychology

531 History of Psychology

535 Animal Behavior

541 Statistical Methods

543 Psychological Tests

544 Topics in Psychopathology and Personality

545 Methods in Social Psychology

547 Methods of Child Study

561 Human Development and Behavior

571 Proseminar in Human Experimental Psychology Fall or spring. Limited to 15 students. Prerequisite: Psychology 473 or permission of instructor. Not offered 1983—84. 
T R 10-12:05 J. Cutting.

The course aims to acquaint students with the recent history of experimental psychology and to help them to identify important trends and underlying assumptions in contemporary writings. After a discussion of the development of psychology, the course examines selected theories of psychology. Knowledge of lower-division introductory psychology is required. The level of the course is that of Aidley's The Psychology of Excitable Cells. The course requires a final comprehensive examination.
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.

572 Proseminar in Social and Personality Psychology Spring. 4 credits. W. 2:30–4, F. 12:15–1:45. D. Regan and others. 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.

573 Proseminar in Biopsychology Fall or spring. 4 credits. Offered every 11th year. Not offered 1983–84; next offered 1984–85. Hours to be arranged. Staff. Survey of research and thought on the evolution and mechanisms of behavior.

580 Experimental Social Psychology (also Sociology 580)
582 Sociocultural Stress, Personality, and Somatic Pathology (also Sociology 582)
583–584 Proseminar in Social Psychology (also Sociology 583–584)
585 Social Structure and Personality (also Sociology 585)
586 Interpersonal Interaction (also Sociology 586)
587 Personality (also Sociology 587)
588 Social Change, Personality, and Modernization (also Sociology 588)
591 Educational Psychology
595 Teaching of Psychology
596 Improvement of College Teaching

600 General Research Seminar No credit.

613 Seminar on Obesity and Weight Regulation (also Nutritional Sciences 613) Spring. 3 credits. Prerequisite: a fundamental knowledge of psychology, physiology, and nutrition is essential. Offered in alternate years. T R 1:30–3. D. Levitsky. This lecture-seminar surveys the literature on feeding behavior, weight regulation, and eating disorders. The course attempts to cover the biological, psychological, and sociological factors involved in human feeding behavior and people's concern about their body weight.

682 Social Psychology (also Sociology 682)
683 Seminar in Interaction (also Sociology 683)
684 Seminar: Self and Identity (also Sociology 684)
685 Sex Differences and Sex Roles (also Sociology 685 and Women's Studies 685) Not offered 1983–84; next offered spring 1985. Hours to be arranged. S. Bern.

690 Nutrition and Behavior (also Nutritional Sciences 690) Spring. 3 credits. Prerequisite: a fundamental knowledge of psychology, physiology, and nutrition is essential. Offered alternate years. Not offered 1983–84; next offered 1984–85. T.R 1:30–3. D. Levitsky. This lecture-seminar surveys the literature of the possible role nutrition may play as a determinant of human behavior. Topics covered include hypoglycemia, food additives and hyperkinesis, ketogenic diets, malnutrition and intellectual development, megavitamin therapy, choline and memory. Emphasis is placed on the analysis of the arguments raised, their history, and review of studies advocating and refuting claims.

700 Research in Biopsychology
710 Research in Human Experimental Psychology
720 Research in Social Psychology and Personality
730 Research in Clinical Neuropsychology Limited to Clinical Neuropsychology Program trainees.

800 Master's Thesis Research in Biopsychology
810 Master's Thesis Research in Human Experimental Psychology
820 Master's Thesis Research in Social Psychology and Personality
900 Doctoral Thesis Research in Biopsychology
910 Doctoral Thesis Research in Human Experimental Psychology
920 Doctoral Thesis Research in Social Psychology and Personality

Summer Session Courses
The following courses are also frequently offered in the summer session, though not necessarily by the same instructor as during the academic year. Not all of these courses will be offered in a particular summer. Information regarding these courses and additional summer session offerings in psychology is available from the department before the end of the fall semester.

101 Introduction to Psychology: The Frontiers of Psychological Inquiry
124 Introduction to Psychology: The Cognitive Approach
128 Introduction to Psychology: Personality and Social Behavior
209 Developmental Psychology
215 Introduction to Linguistics and Psychology
281 Interpersonal Relations and Small Groups (also Sociology 281)
286 Nonverbal Behavior and Communication (also Sociology 286)
325 Introductory Psychopathology
381 Social Psychology
385 Theories of Personality
469 Psychotherapy: Its Nature and Influence
543 Psychological Testing

Quechua
See Modern Languages, Literatures, and Linguistics, p. 164

Romance Studies
The Department of Romance Studies (J. Béreau, chairman) offers courses in French literature, Italian 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, p. 164, for further information about majors and courses.

Romanian
See Modern Languages, Literatures, and Linguistics, p. 164.

Russian Literature
P. Carden, C. Emerson, G. Gibian (chairperson and director of undergraduate studies), 194 Goldwin Smith Hall, 256-4047, P. Schmidt, S. Senderovich, I. Seran, A. Zhokovsky

The Department of Russian Literature offers a variety of courses: some with readings in English translation, others in the original Russian, or both. The connection between Russian history, society, and literature is particularly close, so instruction and discussion in class often include a variety of topics, such as culture and intellectual history, as well as literature. Several courses are interdisciplinary, cosponsored with the departments of History, Economics, Government, Comparative Literature, etc. Students interested in majoring in Russian are strongly urged to take Russian 101–102 as soon as possible, preferably in their first year, or by their second at the latest. Russian 203–204, offered by the Department of Modern Languages and Linguistics, and Russian 201–202, offered by the Department of Russian Literature, complete basic language instruction and introduce students to literature. A further sequence of literature courses in Russian follows Russian 202.

For further information about courses and majors, see Modern Languages, Literatures, and Linguistics, p. 164.

Sanskrit
See Modern Languages, Literatures, and Linguistics, p. 163.

Serbo-Croatian
See Modern Languages, Literatures, and Linguistics, p. 166.

Sinhala
See Modern Languages, Literatures, and Linguistics, p. 166.
degree with honors in sociology a student must maintain a cumulative average of at least B+ in all sociology courses and earn a grade of cum laude or higher on the honors essay.

**Freshman Seminars**

100.2 The Social Order In Detective Fiction

Spring. 3 credits

M W 8:40–9:55. S. Caldwell

That fiction and social science are two ways of commenting on human behavior is well known, but less familiar are the specific ways in which these two approaches intersect and diverge. Our seminar will address this issue by drawing upon that vivid American literary phenomenon, the "hard-boiled" detective story. Students will read stories by the classical authors—Dashiel Hammett, Cornell Woolrich, James M. Cain, and Raymond Chandler, as well as by more contemporary authors such as Ross Macdonald, Stephen Greenleaf, Jerome Charyn, Robert Parker, and James Crumley. Sociological works, for example, studies of actual detectives and of urban crime, will be used together with the fictional accounts.

100.3 Sociology of Organizations

Spring. 3 credits

M W 9:05. D. Fish

This seminar will explore a ubiquitous but often misunderstood phenomenon: organizations. Sociological insights will frame our inquiry into the structure and function of formal organizations. Essays will be written to deepen student appreciation of the expanding role of organizations in modern society.

100.4 The Family

Spring 3 credits

T R 8:40–9:55. S. Ross

Cross-cultural and historical study of the family, focusing on such issues as government intervention in the family and family violence. Weekly writing assignments with option of rewriting papers.

100.5 Hard Choices (also Biology and Society 102)

Fall

M W 11:15. 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 band ends? Are restrictions then appropriate? What form should they take? Who should decide? We will examine how such questions challenge the scientist with a record that contains infinite dilemmas for science, medicine, engineering, universities, and society. Discussion will be based on readings in drama, fiction, philosophy, and debate over such issues as genetic engineering.

105 Mass Media and Society

Fall. 3 credits

T R 8:40–9:55. R. Goldsen

The unifying topic of the seminar is the societal impact of television. The focus of attention is how to observe and decode the medium's distinctive languages, such as imagery, drama, music, sound, and costume; in color, and context. Televisual texts are analyzed concerning social problems such as urbanization, social differences, racial conflict, gender identity, expanding populations, and high rates of crime.

[205 Understanding the Language of Television (also Linguistics 205)

Fall. 3 credits.

T R 9:05 and M W 2:30. L. Waugh, R. Goldsen

Images coming to us through the television screen convey connotative and denotative meanings that are widely understood, quite apart from the verbal language of dialogue and narration. 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? The course addresses these questions, using the techniques and concepts of content analysis (from sociology) and semiotics (from linguistics) to decode images in television's most ubiquitous, repetitive, and stylized context—product commercials. Readings include works in semiotics as well as in the social sciences. Lectures include video demonstrations. Students submit biweekly essays and prepare a class project.

109 Social Change

Fall. 3 credits

T R 2:30–3:45. B. Rubin

In sociology the study of social change is both theoretical and historical. History provides sociologists with a record that contains infinite diversity. The sociologist's mission is to make sense of this diversity. Ultimately, the study of social change attempts to relate individual changes in attitudes and behaviors to large-scale changes in institutions. We will study change in the United States, both past and present, with a substantive focus on modernization and industrialization; economic, ecological, and technological sources of change; and reform versus revolution as sources of change.

**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. 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 201 than in 101, 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 and spring. 3 credits


In the fall, virtually the entire professional staff of the Department of Sociology participates in teaching this course, each professor lecturing on his or her own specialty. In the spring, the course is taught by a single professor. 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, cultural 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 concerning social problems such as urbanization, cultural differences, racial conflict, gender identity, expanding populations, and high rates of crime.

201 Sociological Analysis (also Human Development and Family Studies 201)

Fall. 3 credits

M W 11:15. R. Breiger and staff.

With its emphasis on the evaluation of case studies and research reports, this course aids in the development of analytical 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 sociological issue of vital concern while illustrating the distinctive ways in which sociologists define questions, evaluate the answers, and build upon previous research.

**General Education Courses**

[207 Ideology and Social Concerns

Fall. 3 credits.

4-credit option available. Not offered 1983–84.


Images coming to us through the television screen convey connotative and denotative meanings that are widely understood, quite apart from the verbal language of dialogue and narration. 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? The course addresses these questions, using the techniques and concepts of content analysis (from sociology) and semiotics (from linguistics) to decode images in television's most ubiquitous, repetitive, and stylized context—product commercials. Readings include works in semiotics as well as in the social sciences. Students are encouraged to prepare their own projects using the techniques and concepts of sociologists. Class discussions, and frequent short papers.

207 Ideology and Social Concerns

Fall. 3 credits.

4-credit option available. Not offered 1983–84.

M W 11:15. R. M. Williams, Jr.
Analysis of social and cultural bases of public policies at national, state, and local levels. Relates demographic, social, and cultural factors to the changing economic and social environment, environmental regulation, military affairs, social security and income maintenance, health, medicine, bioethics, centralization, and local control. Deals with two basic dilemmas: (a) the need to maintain social order and (b) the problem of the common welfare. Not offered 1983–84.

MWF 10:10. R. M. Williams, Jr.


Regulations.

MWF 10:10. S. Caldwell.

Concentrates on sociology applied to actual decisions by regulatory commissions, executive agencies, courts, Congress, and other public policy makers. How does sociology become useful? What effects do personal values have on its uses? How well does expert knowledge coexist with political process? The course will cover topics such as welfare reform, teenage pregnancies, Social Security, day-care school effectiveness, a national family policy, and energy.

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. Enrollment limited to 6 sections of 20 students each. S. G. Solomon.

Lecs, T 10:10, secs, M 9:05 or 2:30, T 11 15:2, or W 10:10 or 2:30. A. Shiy.

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.

222 Studies in Organizational Behavior: Regulating the Corporation (also Industrial and Labor Relations 222) Fall. 3 credits.

MWF 2:30-4:35. R. Stern.

Public and private power from an organizational perspective. The resource dependence approach to organization-environment relations provides a framework for interpreting government attempts at the regulation of corporate behavior. Topics cover the structure and functioning of government regulatory agencies and their responses to regulation, including strategy, change, and political influence. The role of interest groups such as consumer or citizen organizations is also considered. Research and case study discussion focuses on the implementation of environmental protection, occupational health and safety, equal opportunity, antitrust, and rate-setting regulations.

230 Population Problems Spring. 3 credits (4-credit option available).

T R 10:10–11:25, plus one hour to be arranged. J. M. Stycos.

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.

238 Historical Development of Women as Professionals, 1800-1980 (also Women's Studies 238 and Human Development and Family Studies 258) Fall. 3 credits.


The historical evolution of the female professions in America, including prostitution, midwifery, nursing, teaching, librarianship, social work, and medicine. Lectures, readings, and discussions are geared to identifying the social and political patterns that fostered the conception of gender-specific roles and the particular historical circumstances that created these different work opportunities. The evolution of professionalism and the consequences of professionalism for women, family structure, and American society are also discussed.

240 Personality and Social Change Spring. 3 credits (4-credit option available).

T R 2:30–3:45. B. C. Rosen.

An analysis of sociological factors that affect and reflect social change. Topics to be examined include models of man and society, national character, modern melancholy, feminism, family and sex roles, industrialism, economic development, and psychocultural conflict.

241 Applied Sociology Fall. 3 credits (4-credit option available). Not offered 1983–84.

MWF 10:10. S. Caldwell.

Concentrates on sociology applied to actual decisions by regulatory commissions, executive agencies, courts, Congress, and other public policy makers. How does sociology become useful? What effects do personal values have on its uses? How well does expert knowledge coexist with political process? The course will cover topics such as welfare reform, teenage pregnancies, Social Security, day-care school effectiveness, a national family policy, and energy.

242 Social Welfare in Europe and North America Spring. 3 credits. Prerequisite: at least one course in sociology. Not offered 1983–84.

MWF 9:05. S. Caldwell.

This course will cover topics such as the nature and origin of the welfare state and some of its problems. Drawing on historical, comparative, and statistical evidence, we will ask how particular welfare state programs (such as Social Security, health, housing, income maintenance, et al.) affect individuals, families, communities, and eventually the entire economy and society. How would life be different without welfare state programs? Would it be possible to revitalize the Western welfare states? What social choices face the welfare states, and what are the most likely directions in the future?

243 Family Spring or summer. 3 credits (4-credit option available).

T R 10:10, plus one hour to be arranged. Spring. co.6.9.

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).

MWF 9:05. B. Rubin.

This course deals with sociological explanations for various forms of social and economic inequality, particularly inequalities associated with class and work. We will describe systems of inequality, analyze various theoretical explanations for those systems, study their social and phychological consequences, and examine the various structures designed to reduce or eliminate inequality. Though covering a broad range of topics, we will be particularly concerned with capitalist societies and the changes in capitalist socioeconomic organization that have occurred in the last one hundred years or so.

248 Politics in Society Spring. 3 credits (4-credit option available). Not offered 1983–84.

T R 2:30–4. Staff.

An examination of the relations between economic, social, and political structures in industrial societies, with particular emphasis on the United States. Topics included are democratic forms of participation in organizations and society at large, social movements, party systems, the structure of power and its legitimation, and voting behavior.

252 Public Opinion Fall. 3 credits (4-credit option available).

T R 2:30–3:20, plus one hour to be arranged. R. Goldsen.

Analysis of the impact of communications systems on the institutional habitat within which public opinion forms. New communications techniques and their social significance are analyzed.

255 Sociology of Science and Technology Fall 3 credits (4-credit option available). Not offered 1983–84.

T R 2:30, plus one hour to be arranged.

How the growth of knowledge is facilitated and impeded by the social behavior of scientists, including competition, teamwork, communication, secrecy, conformity, and deviance, causes and consequences of scientific revolutions, factors affecting scientific careers, history of science as a social institution.

257 Contemporary Japanese Society (also Asian Studies 257) Fall. 3 credits (4-credit option available).

T R 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 old age 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.

265 Hispanic Americans Spring. 3 credits (4-credit option available).


Analysis of the present-day Hispanic experience in the United States. Examination of sociological background and as well as the educational system, problems of old age 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.

277 Psychology of Sex Roles (also Psychology 277 and Women's Studies 277) Spring. 3 credits (4-credit option available). Prerequisite: an introductory psychology course. Not offered 1983–84.


This course addresses the question of why and how adult women and men come to differ in their overall life styles, work and family roles, personality patterns, cognitive abilities, etc. This broad question is examined from five perspectives: (a) the psychoanalytic perspective, (b) the biological perspective, (c) the historical and cultural evolutionary perspective, (d) the child development perspective, and (e) the social-psychological and contemporaneous perspective. Each of these perspectives is also brought to bear on more specialized phenomena relating to the psychology of sex roles, including psychological androgyny, woman's conflict over erotic, the male sex role, equitarian marriage relationships, gender-liberated child-rearing, female sexuality, homosexuality, and transsexuality.

280 Introduction to Social Psychology (also Psychology 280) Spring. 3 or 4 credits. The additional (or fourth) credit is given for attendance at the optional section meetings of the term and for a term paper. Prerequisite: an introductory psychology course.


An introduction to research and theory in social psychology. Topics include perception, the organization and instruction 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.
Intermediate Courses

[284 Social-Psychological Theories and Applications (also Psychology 284)] Fall. 3 credits. Not offered 1983–84
T R 8:40–9:55. Staff.
Emphasis is given to those aspects of personality and social psychology that have led to effective practical applications or that provide reasonable insights into the genesis and/or amelioration of social and personal problems.

[301] Evaluating Statistical Evidence Spring. 4 credits.
M W F 11:15. R. Brege.
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.

[307] Collective Behavior and Social Movements (also Human Development and Family Studies 307) Fall. 3 credits (4-credit option available). Not offered 1983–84
An inquiry into social behavior that breaks with institutionalized or conventional forms, such as acting crowds, riots, social movements, and revolution. Analysis of agents, events, confluence conditions, emergent forms, processes, and consequences. Historical and contemporary studies are covered.

M W F 9:05. R. M. Williams, Jr.
Examines the social context of war and peace, from the perspective of different cultures, the social organization of police departments and its effects on justice and equity, changing divorce laws and personal problems such as rape victims. The first game, Game: Design, Change, and Development, is designed to examine the model. Topics are covered in the second game, Game: Criminology, which will be given in the spring of 1984. Topics discussed in the game include the concepts of culture, subculture, and countercultures as they have evolved in sociology and anthropology. The focus is on formal organizations such as corporations and unions. Topics covered include the nature of ideologies as sense-making definitions of behavior; cultural forms that carry these messages, such as rituals, symbols, myths, sagas, legends, and organizational stories; types of ceremonial behavior, such as rites of passage, rites of enhancement, and rites of degradation; and the role of language. Gestures, physical setting, and artifacts. Emphasis will be placed on empirical examples from both the organizational behavior literature and the professor's field research.

[341] American Society Fall. 4 credits. Prerequisite: a course in sociology or permission of instructor.
M W F 9:05. R. M. Williams, Jr.
Analysis of a total societal system. Critical study of the institutions of kinship, stratification, the economy, the policy, education, and religion. Special attention is given to values and their interrelations and to deviance and evasion. A survey of the groups and associations making up a pluralistic nation is included.

[342] Women and Society Spring. 4 credits.
This course examines how women's roles in the family and household are influenced by their control over their reproductive abilities, their participation in the household economy, and their ownership of property. It contrasts women's roles in Japan with those in China and investigates the narrowing of women's opportunities and symbolic position that has accompanied industrialization in Japan.

[348] Sociology of Law Spring. 4 credits.
M W F 1:25. C. Bohmer.
Legal decisions and 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 the woman, the role of psychiatry in the legal process, and judicial attitudes toward rape victims.

[355] Social and Political Studies of Science (also Science, Technology, and Society 355) Spring. 3 credits.
A view of science, less as an autonomous activity than as a social and political institution. The focus is on its relationship to government, the media, religion, and education. Drawing from recent controversies over science, such questions as ethics and social responsibility in science, struggles to maintain internal control over research and over the teaching of science, and the concept of limits to inquiry are discussed.

[356] Contemporary Sociology for Scientists and Engineers Spring. 4 credits. Prerequisite: elementary linear mathematics or permission of instructor. Not offered 1983–84.
R. McInnis.

[357] Medical Sociology Fall. 4 credits. Prerequisite: a course in the social sciences. Not offered 1983–84.
M W F 1:25. L. Monson.
Health, illness, death, and the health institutions from a sociological 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-L grades optional. Prerequisites: HDFS 150 or one 200-level social science or history course. Human ecology students must register for HDFS 359.
This course provides an introduction to, and overview of, problems and issues in the historical literature on American families and the family life cycle. Reading and lectures demonstrate the pattern of American family experience in the past, focusing on class, ethnicity, sex, and region as important variables. Analysis of the private world of the family deals with changing cultural conceptions of sexuality, sex roles, generations, and family stages throughout the life cycle. Students are required to do a major research paper in 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.

[364] Race and Ethnicity Fall. 4 credits.
An examination of the dynamics of race and ethnic relations in the United States and other societies. Alternative explanations—melt-the-pot assimilation theories, internal colonialism, and Marxist perspectives—are compared and evaluated. Topics include an 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 multiethnic societies such as South Africa and Malaysia are also studied.

M W F 2:30, plus one hour to be arranged. J. Jacobs.
This course examines crime as a social phenomenon. It takes both a historical and cross-cultural approach in order to investigate the processes by which different societies generate different crime problems. Attention is paid to the historical evolution of criminology as a discipline and to the most prevalent theories of crime and crime causation. Special attention is also placed on such topics as white-collar crime, organized crime, and youth gangs. In light of the analysis of crime as a social phenomenon, various strategies of crime control are considered critically.

M W F 1:25. J. Kanl.
A comparison of the economic, political, and social development of Mexico and Cuba following their revolutions. Assigned readings will be in English.

[368] Twentieth-Century Brazil (also History 348) Spring. 4 credits. Prerequisites: two courses in the social sciences. Not offered 1983–84.
A study of the style and development in economy, polity, 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 with other Latin American countries are made. Assigned readings are in English.

[373] Organizational Behavior Simulations (also Industrial and Labor Relations 373) Spring, weeks 1–7. 2 credits. Prerequisites: I&LR 120 and 121 or equivalent.
Hours to be arranged. R. Stern.
Basic principles of organizational behavior are studied through readings and participation in two simulation games. The first game, The Organizational Game: Design, Change, and Development, by Miles...
378 Economics, Population, and Development (also Economics 378) Fall. 4 credits.
M W F 11:10. A. Avell.
An introduction to population from an economic perspective. Particular attention is paid to economic views of population size, fertility, mortality, and migration. Modern population change on development, modernization, and economic growth.

380 Beliefs and Attitudes (also Psychology 380) Spring. 4 credits.
M W F 1:25. L. Metzler.
An intermediate course in social psychology. Attitudes are viewed as emotional, cognitively 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 Ajzen (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 as members of a society).

383 Social Interaction (also Psychology 383) Spring. 4 credits. Prerequisite: a course in social psychology or personality, or one course in psychology and one course in sociology, or permission of instructor. Not offered 1983–84.
Fine-grain analyses of social behavior, its structure, changes, and determinants. Extensive practice in analysis of filmed and taped interactions. Student research is required throughout the course.

384 Cross-Cultural Psychology (also Psychology 384) Spring. 4 credits. Prerequisite: a course in psychology and one in either sociology or social or cultural anthropology, or permission of instructor.
A critical survey of theories, discoveries, and applications in emerging efforts to study human nature, experience, and behavior cross-culturally. Focus on studies of cognition, values, socialization, sociolinguistics, personality, attitudes, stereotyping, ideology, sociocultural development, and mental illness. 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 instructor.
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 should be sure that their background is sufficient for a particular course should consult the professor in charge.

401 Intermediate Sociological Theory (also Rural Sociology 401) Fall. 4 credits.
TR 10–12:05. P. Eberts.
An advanced undergraduate seminar for senior majors in sociology and rural sociology. The course will focus on (1) the central concepts of the sociological tradition; (2) major classical theorists (Max Weber, Durkheim, de Tocqueville) and contemporary counterparts; (3) the functional ideas in contemporary research.

403 Social Networks and Social Structures Fall. 4 credits.
A critical survey of theories and techniques of structural analysis in sociology, centering on the usefulness of 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.

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 concrete historical context. The underlying concerns of the course and the issues that will structure most of the readings and discussions are the distributional consequences of advanced capitalism. For example: Who benefits from capital economics (inflation, unemployment, economic growth)? Does state intervention in the economy freeze existing distributional structures? Does state activity redistribute the economic pie from one group to another? Has the working class materially benefited from unionization and militancy?

420 Mathematics for Social Scientists (also City College and Regional Planning 520) Fall. 2-4 credits.
Elementary matrix algebra, probability theory, and calculus.

422 Sociology of Industrial Conflict (also Industrial and Labor Relations 425) 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.

423 Evaluation of Social Action Programs (also Industrial and Labor Relations 423) Fall. 3 credits. Not offered 1983–84.
Hours to be arranged. 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 economics on their goals. The adaptation of these strategies to large social contexts such as child guidance clinics, mental health clinics, and programs in the poverty area will be emphasized. Included is fieldwork and emphasizes assessment of program implementation.

424 Multivariate Analysis with Quantitative Data Spring. 4 credits. Prerequisite: a college course in statistics (such as Sociology 301) and matrix algebra.
TR 10:10–11:40 and one hour to be arranged. P. Eberts.
The general linear regression model with interval-scaled variables. Detecting violations of assumptions of the model in real data and providing remedies. Both single and multiple equation models (including path analysis).

425 Categorical and Longitudinal Data Analysis Fall. 4 credits. Prerequisite: Sociology 424 or equivalent.
M W 10–11:40. S. Caldwell.
Techniques for including categorical (discrete) variables in multivariate models and for analyzing longitudinal data. Linear and non-linear, log-linear, logit, and dummy variable forms are covered. Real and simulated data exercises are used to examine the relationship of research design to analysis and also to demonstrate the advantages of longitudinal data. Emphasis on applications.

Hours to be arranged. S. Caldwell.
Case studies of recent research sponsored and carried out with the explicit purpose of affecting public policy. Since policy research often requires unusually rigorous evidence, we assess the strength and weaknesses of alternative research designs: experimental versus observational, aggregate versus micro, longitudinal versus cross-sectional, large samples versus case studies. Since policy research often faces strong pressures, we examine the politics of putting research questions on the agenda, preserving the investigator's independence, and interpreting research results. Other topics include academic and non-academic settings for policy research; policy research and the disciplines (forecasting, simulations, careers in policy research).

427 The Professions: Organization and Control (also Industrial and Labor Relations 427) Fall. 4 credits. Not offered 1983–84.
M W F 10:10. R. Stern.
The professions (including medicine, law, and several others) are the cases used in the following to examine issues of occupational organization and control. Professional associations attempt to set standards of ethics and practice, regulate educational programs, maintain specific images, and control the supply of entrants to professions. How do such associations function and how successful is their attempt at regulation of professional conduct? How might the potential transformation of some professional associations into union-style organizations be interpreted? These issues are considered in the context of the role of professions in contemporary society.

430 Social Demography Spring. 4 credits. Prerequisite: junior class standing or permission of instructor.
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. Prerequisite: Sociology 230 or permission of instructor. Offered alternate years. Not offered 1983–84.
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.

434 Human Fertility in Developing Nations  
Spring. 4 credits. Prerequisite: Sociology 230 or permission of instructor. Offered alternate years. Not offered 1983–84.
T R 10:10–11:35. A. Shlay.
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.

439 Social and Demographic Changes in Southeast Asia  
Fall. 4 credits. Not offered 1983–84.
R 2:30–5. C. Hirschman.
Survey of current trends in Southeast Asia. Demographic patterns are studied as determinants and consequences of changes in social, economic, and political institutions in different societies. General demographic theory and methods will be introduced as necessary to understand contemporary studies of demographic change in Southeast Asia.

440 Educational Institutions  
Spring. 4 credits. Not offered 1983–84.
T R 10:10–11:35. Staff.
The role of educational institutions in industrialized societies is studied. The primary focus will be on the debate between those who see educational institutions as extending opportunity and assimilating marginal groups, and others who see them as arenas of conflict in which privileged groups successfully struggle to maintain their advantages.

442 Family and Kinship in History  
Spring. 4 credits. 
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.

443 Seminar: Community Studies  
T 2:30–4:30. J. Kah.
Reading and discussion, in a seminar style, of some classic studies of small towns and urban districts in the United States and Europe. Some likely selections will be Middletown, Yankee City, Street Corner Society, Urban Villagers, Talley's Corner, Behind Ghetto Walls, Small Town in Mass Society.

444 Contemporary Research in Social Stratification  
Fall. 4 credits. Not offered 1983–84.
T 2:30–5. R. Breiger.
Stratification and mobility as paired concepts requiring mutual elaboration. The interplay of structure (occupational groups, labor markets, organizations, classes) and process (tracking, career trajectories, socioeconomic attainment).

445 Law and Social Theory  
Spring. 4 credits. Prerequisite: Sociology 348 or permission of instructor or graduate standing. Not offered 1983–84.
T 3:35–5:30.
Major intellectual traditions contributing to what is loosely called the sociology of law. Attention is paid to the classical theorists—Weber, Durkheim, and Marx—as well as to contemporary American and European legal and sociological scholars. The underlying theme is the relationship of law to social order.

447 Social Aspects of Housing and Neighborhood (also Consumer Economics and Housing 443)  
Fall. 3 credits. Prerequisites: Consumer Economics and Housing 148 or 247. S-U Grades only.
The relationships between housing and social behavior and organization are examined. Levels of analysis include the specific 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.

454 Religion and Secularism in Western Society  
Spring. 4 credits. Prerequisite: Sociology 101 or permission of instructor. Not offered 1983–84.
M W F 9:05. Staff.
The interrelationship of culture, society, and religion. Religion and social stratification, religion and economic and political institutions, and social change and religion. The major emphasis will be on American society and American religious institutions.

462 Society and Consciousness  
Spring. 4 credits. Limited to 15 students. Prerequisite: permission of instructor. Not offered 1983–84.
Hours to be arranged. R. Goldsen.
An examination of the role of communications systems in the formation of human consciousness.

481 Advanced Social Psychology (also Psychology 481)  
Fall. 4 credits. Limited to 30 students. Prerequisite: a course in social psychology of small groups. Staff.
T 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, social and cognitive determinants of the emotions, cognitive dissonance, attribution processes, interpersonal attraction, 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 1983–84.
Representative theories of research on socialization at different ages are analyzed, focusing particularly on the underlying processes. The new topic of personal and sociocultural maturity is also analyzed and its relation to socialization processes is evaluated in terms of recent evidence. 

486 Interpersonal and Social Stress and Coping (also Psychology 486)  
Spring. 4 credits. Limited to 25 upperclass students. Prerequisite: background in psychology and introductory statistics, or permission of instructor.
A critical review of work in interpersonal, intergroup, situational, and sociocultural sources of stress; the major psychophysiological concomitants of stress; result of coping strategies and aids to coping. Data from the laboratory, industry, and other cultures will be analyzed.

491 Selected Topics in Sociology  
Fall or spring. 2–4 credits. Prerequisite: permission of instructor. Hours to be arranged.

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 486. 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.
Staff.

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 seminars that are likely to be offered 1983–84, but others may be added. Students should check with the department before each term.

515 The Politics of Technical Decisions (also Science, Technology, and Society 541, City and Regional Planning 541, and Business and Public Administration NPA 515)  
Fall. 4 credits.
This is a seminar dealing with the relationship between knowledge and power, between technology and democratic political institutions in modern society. Our focus will be on decision making in areas often defined as "technical" and best resolved by experts. We shall examine the origins of "technocratic politics," the politics of expertise, and the questions of political versus professional control that are raised by controversial technology choices. Our central concern will be the clash between technological and democratic values.

521 Macro Organizational Behavior (also Industrial and Labor Relations 521)  
Spring. 3 credits.
Hours to be arranged. R. Stern.
Formal organizations are studied from the perspectives of classical organization theory, human relations theory, and more recent comparative and cross-cultural analysis. Contemporary theories and quantitative approaches to organizational structure are also considered in some detail. Intended to be preliminary to more intensive work in organizational behavior.

523 Analysis of Data with Measurement Error  
Fall. 4 credits. Prerequisite: Sociology 424 or equivalent. Not offered 1983–84.
Hours to be arranged. Staff.

531 Population Policy (also Biology and Society 401)  
Spring. 4 credits. Prerequisite: graduate standing or permission of instructor.
The ways in which societies try to affect demographic trends. Special focus is on government policies and programs to reduce fertility.

541 Sociological Theory  
Fall. 4 credits. Prerequisite: graduate standing or permission of instructor.
Contemporary and classical theories, including Durkheim, Marx, Weber, and Parsons. Systematic review of theory and research, with emphasis on
systems.

An examination of the sociology of social, economic, and political change. Attention is given to the nature and size of social systems.

601 Southeast Asia Seminar: Malaysia (also Asian Studies 601) Fall. 4 credits. R 3:30–4:30. C. Hirschman. Survey of Malaysian society from prehistory to the present, with emphasis on political, economic, and social change of the nineteenth and twentieth centuries. Among the topics to be considered in an historical perspective are the plural society, colonial rule and its legacy, the export economy and immigrant labor, Malay social structure, the “Emergency,” postindependence politics and parties, economic planning and the New Economic Policy, and demographic changes. Students will write research papers.

624 Advanced Methods of Epidemiology (also Veterinary Medicine 665) Fall. 4 credits. T 3:30–4:30. 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.

625 Analysis of Published Research in Organizational Behavior (also Industrial and Labor Relations 727) Spring. 3 credits. Prerequisite: one year of statistics and permission of instructor. W 1:30–4:30. R. Stern. This advanced research methods course that critically examines published research papers in the field of organizational behavior in terms of research design and method as well as theory.

627 Work and Industrial Conflict (also Industrial and Labor Relations 727) Spring, weeks 8–14. 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, and 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.


658 The Course of Life: Developmental and Historical Perspectives (also Human Development and Family Studies 688) Spring. 3 credits. Enrollment limited to 15. Prerequisite: permission of instructor. S-U grades optional. College of Human Ecology students must register for HDFS 666. Hours to be arranged. G. Eldred. A seminar that explores the life course as a theoretical orientation, methodology, and field of study. Special emphasis is devoted to multidisciplinary convergence on life course problems; to theory and research on the interaction of social, psychological, and biological processes from birth to death; and to historical influences.

670 Community, Housing, and Local Political Processes (also Consumer Economics and Housing 670) Spring. 3 credits. S-U grades optional. Offered alternate years. 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 empirical perspectives on population, 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. Not offered 1983–84. T 1:25–4:25. A. Shlay. This course explores the sources of American political power 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.

677 Seminar in Field Research (also Industrial and Labor Relations 677) Spring. 3 credits. Enrollment limited. Prerequisite: permission of instructor. M W 12:20–1:35. H. Trice. Recent research efforts are 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.


[685 Sex Differences and Sex Roles (also Psychology 685 and Women's Studies 685) Fall. 4 credits. Not offered 1983–84. Hours to be arranged. S. Bern.]

691–692 Directed Research Fall or spring. Up to 4 credits, to be arranged. Prerequisite: permission of instructor.

695 Thesis Research Fall or spring. Up to 6 credits, to be arranged. Prerequisite: permission of thesis director.

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 obtained at the Sociology Department office, 316 Uris Hall.

Swahili

See Africana Studies and Research Center, p. 199.

Tagalog

See Modern Languages, Literatures, and Linguistics, p. 168.

Tamil

See Modern Languages, Literatures, and Linguistics, p. 169.

Telugu

See Modern Languages, Literatures, and Linguistics, p. 169.

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 260
3) A grade of C or better in the above courses.
4) Consultation with the department's director of undergraduate studies.
The requirements for the drama concentration have been reformulated for students in the class of 1985 and beyond. Students in the class of 1984 are to follow the old requirements but should note the fact that the current course in theatre history, courses no longer correspond to previous catalog descriptions under the same number. For clarity, major requirements for the classes of 1984, 1985, and beyond are listed separately below.

Requirements for the class of 1984:
1) Theatre Arts 240, 250, 280.
2) A minimum of four laboratory courses chosen from Theatre Arts 151, 155, 251, 301, and 451. At least one term of 151 and 155 must be taken. At least one laboratory course a year must be taken in the junior and senior years.
3) Two courses in theatre studies chosen from Theatre Arts 325, 326, 327, 331, 332, 333, 334, 335, 336, 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) Techniques in which a student receives a grade below C cannot be used to fulfill the requirements for the major.

Requirements for the class of 1985:
1) Theatre Arts 230, 250, 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 1986 and beyond:
1) Theatre Arts 230, 250, 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.

The Dance Program
In addition to courses in composition, history, and movement sciences, courses in dance technique are offered each semester: four levels of modern and three of ballet. Registration takes place in Teagle Hall. Technique classes are intended to develop strength, flexibility, coordination, and the ability to perceive and reproduce phrases of dance movement with rhythmic accuracy, clarity of body design, and fullness of expression. The more advanced classes require the mental, physical, and emotional flexibility to perform more complex phrases in various styles. Tai Chi, a Chinese system of movement for health, self-defense, and meditation, and other dance styles and forms such as jazz, Japanese Noh, and Indian and Javanese dance are offered on a rotating basis. Students may satisfy the physical education requirement by taking any of these courses. Up to four credit each term for four terms (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.

Theatre Colloquium
On announced dates during the year, the entire department—faculty, undergraduate and graduate students—meets on Fridays, 12:20–2:00 p.m. in 101 Lincoln Hall. These sessions, which take the form of guest lectures, research presentations, and critiques of major Theatre Cornell productions, are designed to encourage an understanding of the integration of all components of theatre in its various forms.

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 related coursework.
2) Rehearsal and performance laboratory. Students may enroll in Theatre Arts 155, 151, or 452 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 extra-curricular 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 or 140.

Freshman Seminars
108 Writing about Film (also English 108) Fall and spring. 3 credits.
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. They will be required to attend a two-hour screening outside of class approximately once a week. The writing requirement comprises five papers averaging five pages in length, and eight to ten short writing assignments. No familiarity with film history of analysis is expected.

140 From Script to Stage: Writing about the Theatrical Process Fall or spring. 3 credits.
Sec 1, M.W.F 9:05, sec 2, fall only. M.W.F 1:25.
Bradley, J. Viscomi.
In this course students will explore and write about the process through which drama becomes theatre: how the methods of playwright, actor, director, and designer dovetail to create the theatrical piece. Students will be asked to apply the theatrical strategies of theatre to their own essay writing. Texts will include Theatre Cornell productions.
Practice and application of skills and methods to various styles of dramatic literature, practical exploration of historical and social influences as determinants of style.

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 beginning of classes. Registration only through department roster in 104 Lincoln Hall.

F 2–4:25. P. Curtis and other teachers from the American Mime Theatre. American Mime is a unique performing art created by a particular balance of playwrighting, acting, moving, pantomime, and theatrical equipment. It is a complete theatre medium defined by its own aesthetic laws, with its own techniques, script material, and teaching methods, in which nonspeaking actors, in characterization, perform the symbolic activities of American Mime plays through movement that is both telling and beautiful.

576 American Mime Orientation II Spring. 2 credits. Prerequisite: Theatre Arts 575 or permission of instructor. Registration only through department roster in 104 Lincoln Hall.


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. Staff. Development of physical body for expression through various techniques and practice, including effort-shape; improvization; composition; modern dance and ballet; period dance; stage combat technique in foil, epee, saber, and dagger; tumbling; akido 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/director training program. Others by permission of instructor.


751 Rehearsal and Performance Fall. 2 credits. May be repeated for credit. Limited to students in M.F.A. professional actor training.

Staff. Study, development, and performance of assigned roles.

752 Rehearsal and Performance Spring. 2 credits. May be repeated for credit. Limited to students in M.F.A. professional actor training.

Staff. Study, development, and performance of assigned roles.

782 Voice Technique I Fall and spring. 2 credits each semester. Limited to students in the first-year M.F.A. professional actor/director training.

M W F 10:45–12, T R 1–2:15. Staff. Emphasis on correct use of the vocal instrument through exercises designed to achieve the freedom, flexibility, control, and power required for the professional actor.

783 Voice Technique II Fall and spring. 2 credits each semester. Limited to students in second-year M.F.A. professional actor training.


784 Speech Technique I Fall and spring. 2 credits each semester. Limited to students in first-year M.F.A. professional actor/director training.

T R 10:45–12. A. Van Dyke. Ear training; sound designation of vowels, consonants, and diphthongs through exercises, sound symbolization through use of the International Phonetic Alphabet (IPA), eradication of regionalisms, development of standard American speech.

785 Speech Technique II Fall and spring. 2 credits each semester. Limited to students in second-year M.F.A. professional actor training. Prerequisite: Theatre Arts 784.

M W 10:45–12. A. Van Dyke. Refinement of sound distinctness and execution; study of dramatic texts in prose and poetry to develop techniques in scansion, emphasis, rhythm, range, and melody.

Film

[374 Introduction to Film Analysis: Meaning and Value Summer or fall. 4 credits. Not offered fall 1983, next offered summer 1984.

T R 10:10–11:30. D. Fredericksen. 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. Not offered 1983–84; next offered 1984–85. Fee for screening expenses, $10 (this fee is paid in class).

T R 2–4:25. D. Fredericksen. Consideration of the broad patterns in the history of the commercial narrative film, viewed as an artistic medium and as a system requiring the massive consumption of artifacts. Emphases include the early articulation of a cinematic language, realism as an artistic style, the nature and functions of popular film, and modernism. Major figures include Griffith, Eisenstein, Murnau, Von Stroheim, 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 2–4:30. D. Fredericksen. Documentary figures covered include Vertov, Flaherty, Grierson, Ivens, Lorentz, Resnais, Capra, and Jennings. Within the history of the experimental and personal film, emphases are the avant-garde of the twenties, the movement toward documentary in the thirties, and American experimental and personal film from the forties to the present.

377 Fundamentals of 16-mm Filmmaking Fall or spring. 4 credits. Limited to 10 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.

The mechanics and expressive potential of 16-mm filmmaking, including nonsynchronous sound. Each student completes four short film exercises and a longer sound film which will be screened publicly. Students retain ownership of all films they produce. No prior filmmaking experience is assumed.

[378] Russian Film of the 1920s and French Film of the 1960s
Spring. 4 credits. Prerequisite: Theatre Arts 375. Not offered 1983–84; next offered 1984–85. Fee for screening expenses, $10 (this fee is paid in class).


An intensive treatment of two distinct periods of innovation in film theory and history. Emphasis on the relationship between theory and practice. Major figures include Eisenstein, Pudovkin, Vertov, Dovzhenko, Godard, Truffaut, Resnais, Robbe-Grillet, Eustachie, Rivette, and Bresson.

[379] International Documentary Film from 1945 to the Present
Spring. 4 credits. Prerequisite: Theatre Arts 376. Not offered 1983–84; next offered 1985–86. Fee for screening expenses, $10 (this fee is paid in class).


Emphasizes on the contemporary documentary film as a sociopolitical force, as an ethnographic tool within and without a filmmaker's own culture, and as an art form with its own theories and philosophical questions. Major figures, structures, and movements covered include Jennings, Rouquier, Leacock, Malle, Rouch, Sofanas, national film boards, Challenge for Change, direct cinema, cinema verite, and revolutionary documentary of the Third World.

475 Seminar in the Cinema I
Spring. 4 credits.


Topic for 1984: The National Film Board of Canada (NFB). By most accounts, the NFB is the most successful government-subsidized filmmaking institution among the Western democracies, and especially in the area of documentary film. Extended consideration of the history of the NFB from its inception under Grierson to the Challenge for Change program and its aftermath.

477 Intermediate Film Projects
Spring. 4 credits. Limited to 4 students. Prerequisites: Theatre Arts 377 or equivalent, and permission of instructor. Fee for materials and processing, $25 (this fee is paid in class).


The development and completion of individual projects, with emphasis 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.

653 Myth onto Film (also Anthropology 563)
Fall or 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.


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, a nonphotograph 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.

Inter-University Center for Film and Critical Studies in Paris
Cornell is part of a consortium serving the center. Cornell students may earn full Cornell credit for study at the center. For course listings and other information, students should contact Professor Don Fredriekcnsen, 104 Lincoln Hall.

Dance
155 Rehearsal and Performance
Fall and spring. 1–2 credits. 1 credit per production experience per term up to 2 credits per term. Students must register for this course in the term in which credit is earned. Requests for retroactive credit will not be honored. Limited to students who are assigned roles after tryouts at the department's scheduled auditions. Students should add this course only after they have been assigned roles. S-U grades only.

Staff.

The study, development, and performance of roles in departmental theatre or dance productions.

200 Introduction to Dance I
Fall. 3 credits.

Concurrent enrollment in a dance technique class at the appropriate level is required. Registration only through department roster in 302 Helen Newman Hall.


Movement improvement and composition, readings in dance techniques and nineteenth-century dance history. Films and videotapes are used.

201 Introduction to Dance II
Spring. 3 credits. Prerequisite: Theatre Arts 200 or permission of instructor. Concurrent enrollment in a dance technique class at an appropriate level is required. Registration only through department roster in 302 Helen Newman Hall.


Continuation of Theatre Arts 200.

210 Beginning Dance Composition and Music Resources
Fall or spring. 4 credits. Prerequisites: Theatre Arts 200 or 201 or permission of instructor. Prerequisites for dance majors only: Music 141. Concurrent enrollment in a technique class at the appropriate level is required. Registration only through department roster in 302 Helen Newman Hall.

M W 6:30–8 p.m. J. Morgenroth, D. Borden.

This course is designed to develop resources in movement and in music as it relates to dance. Students will prepare studies concerned with use of space, time, body design, and dynamics. Various approaches to the structuring of these elements will be the basis for the study of form as it applies to dance and music.

211 Beginning Dance Composition and Music Resources
Fall or spring. 4 credits. Prerequisite: Theatre Arts 200, 201, and 210.

M W 6:30–8 p.m. J. Morgenroth, D. Borden.

Continuation of Theatre Arts 210.

307 Modern Dance III (also Physical Education 138)
Fall or spring. 3 credits. May be repeated for up to 4 credits. Prerequisite: Theatre Arts 306 or Physical Education 436 or permission of instructor.

T R 4:40–6:10. Staff.

Continuation of Theatre Arts 306.

310 Advanced Dance Composition
Fall or spring. 4 credits. Prerequisites: Theatre Arts 210 or 214.

Hours to be arranged. Staff.

Further problems in composition for groups.

312 Physical Analysis of Movement
Fall. 3 credits.


This course is an examination of human movement with particular attention to dance movement. Readings in The Structure and Function of Man, by Jacob, Lossow and Francine, will be supplemented by laboratory work in movement analysis.

314 History of Dance I
Fall. 3 credits.

T R 3:05–4:35. C. Feck.

A survey of the history of dance from ancient times to the Renaissance, with emphasis on the development of theatrical forms in Western civilization.

315 History of Dance II
Spring. 3 credits.

Hours to be arranged. P. Lawler, J. Morgenroth.

A survey of the history of Western theatrical dance from the Renaissance to contemporary times.

318 Historical Dances
Spring. 2 credits. Prerequisite: Ballet II or Modern Dance II. Not offered 1983–84.


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.

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 1983–84.

Directing
398 Directing I
Fall. 3 credits. Prerequisites: Theatre Arts 250, 280, and permission of instructor.


An exploration of the role of the director through study and exercises; the process of conceptualization and use of visual, temporal, and dramatic values for interpretation of the script, directorial text analysis; applied projects.
498 Directing II  Spring. 4 credits. Prerequisite: Theatre Arts 398 or permission of instructor. M W F 2:30–4:25. R. Shank. Use of movement and space, character development techniques; rehearsal process; production procedures; applied project in performance.

499 Projects in Directing  Fall or spring. 1–4 credits. Prerequisite: permission of instructor. This course may be added at any time during the term without penalty. R. Shank. The planning and execution of directing projects by advanced students in the public performance facilities of the Department of Theatre Arts or by those assigned assistant directing in the Theatre Cornell season.

696 Directing Technique  Fall and spring. 4 credits each semester. Limited to students in the M.F.A. professional director training; others by permission of instructor. T R 12:20–2:15. R. Shank. Approaches to directorial controls for text, actors, time, structure, movement, space, and design, towards the development of a production concept from script to stage to audience. Practicums include work with actors, assistant director assignments, and the directing of complete short works.

798 Form and Style In Directing  Fall and spring 4 credits each semester. Limited to students in the M.F.A. professional director training; others by permission of instructor. R. Shank. An exploration of major dramatic forms through analytical, interpretative, psychological, and technical methods for the director's realization of inherent values towards a coherent production style. Practicums include the direction of full-length works each term.

Theatre Design and Technology

151 Production Laboratory I  Fall or spring. 1–2 credits. May be repeated for credit. Orientation meeting in Willard Straight Theatre at 7:30 p.m. on the second day of classes. Staff. Instruction and practice at the introductory level on the basic techniques of construction and operation of scenery, costumes, lighting, and sound. Instruction is supervised by the design/technology faculty and is directed towards the production of plays for the Theatre Cornell season.

153 Stage Management Production Laboratory  Fall and spring. 1–3 credits. May be repeated for credit. Orientation meeting in Willard Straight Theatre at 7:30 p.m. on the second day of classes. Staff. Practical production experience and specific responsibility—on all levels—in stage management assignments on department productions. Theatre Arts 370 complements this course. Guided and supervised by appropriate faculty on individual productions.

250 Fundamentals of Theatre Design/Technology  Fall or spring. 4 credits. Not offered to first-year freshmen. Lab-lab, M W F 2:30–4:25. Staff. An introduction to design and technical experience in the theatre, with particular attention to the unique collaboration of director, designer, and technician. Lectures, discussions, and extensive project work will relate the visual principles of designing scenery, costumes, and lighting to the production techniques by which designs are realized on the stage. This course is prerequisite to all 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 second day of classes. Staff. Practical production experience that involves specialized instruction and specific responsibilities in positions such as light-board operator, wardrobe mistress, and set or properties-crew head. There is also preparatory work in specific areas of more advanced construction in scenery, costumes, lighting, and sound. Instruction and practice is supervised by the design/technology faculty and is directed towards the production of plays for the Theatre Cornell season.

260 Visual Concepts for the Theatre  Fall. 3 credits. T R 12:20–2:15. V. Becker. A studio-examination of the visual expression of ideas and concepts that focuses on developing the creative design process. Begins with the translation of simple thoughts and emotions into the visual language by which a designer can communicate with an audience. Concentrates on practical application of this process to the complex objectives of design and directing in the theatre.

261 Production Concepts for the Theatre  Fall. 3 credits. M W 12:20–2:15. R. Archer. A studio-examination of the visual expression of ideas and concepts that focuses on developing the creative design process. Begins with the translation of simple thoughts and emotions into the visual language by which a designer can communicate with an audience. Concentrates on practical application of this process to the complex objectives of design and directing in the theatre.

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 second day of classes. R. Dressier. Practical production experience that offers an opportunity for advanced positions in design and/or technology. These include full responsibility for an aspect of a smaller production, major responsibilities as an assistant on a major production, or significant responsibilities as major crew head. All work is guided and supervised by appropriate faculty and is an active part of the Theatre Cornell season.

362 Lighting Design and Technology  Fall. 4 credits. For both majors and qualified nonmajors in related fields. Prerequisite: Theatre Arts 250 or permission of instructor. T R 10:10–12:05. R. Dressier. 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 lighting practices in the professional theatre.

364 Scene Design and Technology  Spring. 4 credits. For both majors and qualified nonmajors in related fields. Prerequisite: Theatre Arts 250 or permission of instructor. M W 12:20–2:15. R. Archer, V. Becker. A study of the basic problems of design and technology of scenery for the stage. Will explore the design process, use of research and imagery, techniques of design communication, and materials and associated tools for the realization of designs on the stage.

366 Costume Design/Technology  Spring. 4 credits. For both majors and qualified nonmajors in related fields. Prerequisite: Theatre Arts 250 or permission of instructor. T R 12:20–2:15. S. Perkins and staff. An introduction to costume design and technology that includes the analysis of the play and its characters, the use of period research as a source of style and construction techniques, and the application of materials, tools, and techniques to the process by which literary characters are given visual dramatic form on the stage.

370 Stage Management  Fall. 1 credit. Prerequisites: Theatre Arts 240 and 250. T R 4:30–5:25. R. Dressier. 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.

451 Production Laboratory IV  Fall or spring. 1–4 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 second day of classes. R. Dressier. Practical production experience requiring full design and/or technical responsibility for an aspect of a play produced within the Theatre Cornell season. Student designer, technician, or stage manager will be assigned an appropriate faculty supervisor.

462 Advanced Lighting Design and Technology  Spring. 4 credits. May be repeated for credit. Prerequisite: Theatre Arts 362 and permission of instructor. R. Dressier. An exploration of lighting design/technology on a more advanced level, with particular stress upon project work and occasional production assignments.

464 Advanced Scene Design/Technology  Fall. 4 credits. May be repeated for credit. Prerequisite: Theatre Arts 364 and permission of instructor. M W 12:20–2:15. V. Becker. An exploration of scene design and technology on a more advanced level, with particular stress upon project work and occasional production assignments.

466 Advanced Costume Design/Technology  Fall. 4 credits. May be repeated for credit. Prerequisite: Theatre Arts 366 and permission of instructor. T R 12:20–2:15. S. Perkins and staff. An exploration of costume design/technology on a more advanced level, with particular stress upon project work and occasional production assignments.

550 Design Studio I  Fall. 1–6 credits. Prerequisite: permission of instructor. M W F 9:05–11. Staff. Lecture and studio work in the principles of production design, for graduate students and advanced undergraduates with professional-level interest. Focuses upon the development of personal design processes for the profession.

551 Production Laboratory V  Fall or spring. 1–6 credits. May be repeated for credit. Prerequisite: permission of instructor. Hours by arrangement. R. Archer, S. Perkins. Production design, technical, or management responsibilities for graduate students.

560 Design Techniques Studio I  Fall or spring. 1–4 credits. Prerequisite: permission of instructor. T R 9:05–12:05. Staff. Advanced studio work in the language of design: the representation of environments for the stage in both two- and three-dimensional form. Will include selected topics in creating, painting, perspective, and color theory.

562 Lighting Techniques I  Fall. 4 credits. Prerequisite: Theatre Arts 462 and permission of instructor. T R 12:20–2:15. R. Dressier. Lecture and studio work in the principles of lighting, for graduate students and advanced undergraduates with professional-level interest. Focuses upon professional practices and standards.
564 Scenic Techniques I Spring. 4 credits. Prerequisite: permission of instructor. M W 9:05–11. R. Archer. Lecture and studio work in the principles of scenery for graduate students and advanced undergraduates with professional-level interest. Focuses upon the technical and procedural practices that influence the development of a personal design process for the profession.

566 Costume Techniques I Spring. 4 credits. Prerequisite: permission of instructor. M W 9:05–11. S. Perkins. Lecture and studio work in principles of costumes for the stage. For graduate students and advanced undergraduates with professional-level interest. Will focus upon the development of design to the skills by which designs are visualized and realized on the Aesthetics of theatricality.

650 Design Studio II Fall or spring. 1–6 credits each semester. Prerequisite: permission of instructor. Hours to be arranged. Staff. Selected topics in scene design. Topic for 1983–84: History of styles of design.


Theatre History, Literature, and Theory

230 Introduction to Theatre History Spring. 3 credits. M W F 9:05. S. Williams. 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.

240 Introduction to the Theatre Fall, spring, or summer. 3 credits. M W F 11:15. Fall. R. Gross. 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.

300 Independent Study Fall or spring, 1–4 credits, no more than 4 credits each semester. May be repeated for credit. Limited to upperclassmen. 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.

325 Classic and Renaissance Drama (also Comparative Literature 352) Fall. 4 credits. M W F 9:05. G. Cleary. 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, focussing 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. M W F 2:30. R. Gross. Readings from major dramatists from Corneille to Chekhov, including such authors as Moliere, Congreve, Marivaux, Goldoni, Gozzi, Schiller, Kleist, Gogol, Ostrovsky, and Ibsen.

327 Modern Drama (also Comparative Literature 354) Fall. 4 credits. M W F 1:25. S. Williams. Readings from major dramatists of the twentieth century, including Ibsen, Chekhov, Strindberg, Shaw, Pirandello, Ionesco, Brecht, Beckett, and contemporary American and European playwrights.

331 The Classical Theatre Spring. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor. T R 10:10–11:25. M. Hays. An examination of major developments in the theatre—acting, staging, dramaticity—and the historical background to these 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 1983–84; next offered 1984–85. R. Gross. 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 the early seventeenth centuries. Representative plays will be read and discussed in their theatrical context.

333 English and European Theatre, 1642–1800 Fall. Credits. Prerequisite: Theatre Arts 230 or permission of instructor. Not offered 1983–84; next offered 1984–85. M. Hays. 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 works of Moliera, Goldoni, Garrick, Schroder, and a few of the writers of the Watteau-Greuze family. Representative plays of the period will be read and discussed in their theatrical context.

334 Romantic and Early Modern Theatre Fall. 4 credits. Prerequisites: Theatre Arts 230 or permission of instructor. M W F 10:10–11. S. Williams. A study of the development of the English and European theatre from 1800 to the early years of the modern theatre. Topics include romanticism in the theatre, the nineteenth-century commercial theatre, and the work of the independent theatre between 1887 and 1914 as it will be placed on the rise of the virtuoso actor and the stage director. In addition to representative plays, the theoretical writings of such figures as Hugo, Zola, Stanislavsky, Appia, and Craig will be discussed.

335 The Modern and Contemporary Theatre Spring. 4 credits. Prerequisites: Theatre Arts 230 or permission of instructor. Not offered 1983–84; next offered 1984–85. S. Williams. The history of theatre and theatrical productions in Europe from the early modern theatre to the present day. Special consideration will be given to central figures as Vsevolod Meyerhold, Leopold Jessner, Bertolt Brecht, Antonin Artaud, Louis Jouvet, Wieland Wagner, Peter Brook, and Josef Svoboda. The development of ensembles such as the Royal Shakespeare Company and the Polish Laboratory Theatre will also be examined. Representative plays will be read and discussed in their theatrical context.

336 American Drama and Theatre Spring. 4 credits. Prerequisite: Theatre Arts 230 or permission of instructor. M W F 1:25. R. Gross. A study of the American theatre and representative American plays, with emphasis on drama from O'Neill to the present.

337 Opera Fall. 4 credits. Prerequisites: Theatre Arts 230 or permission of instructor. Not offered 1983–84. S. Williams. The same as Music 274, but with one additional meeting a week devoted to discussion of staging and theatre history.

348 Playwriting Fall. 4 credits. Prerequisite: permission of instructor. T R 2:30–3:45. R. Gross. 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.


431 Theory of the Theatre and Drama I Fall. 4 credits. Prerequisite: some theatre history and dramatic literature work at the 300 level or permission of instructor. Not offered 1983–84; next offered 1984–85. S. Williams. A study of various theories of dramatic form and theatrical presentation from Aristotle and Horace to Goethe and Schiller.

432 Theory of the Theatre and Drama II Fall. 4 credits. Prerequisite: some theatre history and dramatic literature work at the 300 level or permission of the instructor. T R 10:10–11:25. M. Hays. A study of various theories of dramatic form and theatrical presentation from Goethe and Schiller to the present.

433 Dramaturgy: Play and Period Spring. 4 credits. Prerequisites: some theatre history and dramatic literature work at the 300 level or permission of the instructor. Not offered 1983–84; next offered 1984–85. R. Gross. An intensive study of the theatrical and cultural background of a play or plays being performed in the season at Theatre Cornell. The course will also include a discussion of the principles of dramaturgy, and all students will be expected to complete a dramaturgical assignment.

434 Theatre and Society (also English 454) Spring. 4 credits. Prerequisite: some theatre history of dramatic literature work at the 300 level or permission of the instructor. T 2:30–5. S. Williams. An examination of the role theatre has played in the political and social life of Western society. This year the subject is Irish drama. The course will be centered around the plays of Yeats, Synge, and O'Casey, though plays by minor dramatists of the Abbey Theatre, such as Lady Gregory, Colum, and Fitzmaurice will be read. Specific focus will be upon the uses theatre makes of nationalism and vice versa and upon the relationship between theatre and national myth.

435 Special Topics Spring. 4 credits. Prerequisite: some theatre history or dramatic literature work at the 300 level or permission of the instructor. R 2:30–5. M. Hays. Topic: The postmodern theatre: from Beckett to Handke.
Special Programs and Interdisciplinary Studies

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.

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.

633 Seminar in Theatre History
Spring. 4 credits. T 2:30–5. S. Williams.
Topic: Irish-drama and theatre.

636 Seminar in Dramatic Criticism
Fall. 4 credits. Prerequisite: permission. R 2:30–5. M. Hays.
Topic: The origins of the modern drama: text and context.

672 Philosophy and Theory of Tragedy (also English 676)
The course will reflect on the theoretical "return" of tragedy. What lies behind our critical interest in the tragic? Is our nostalgia for the tragic related to the structure of tragedy as nostalgic, historical, and psychological? As a way of understanding the history of tragic thought in literature and prose, the course will provide a selective survey of theoretical and philosophical views of tragedy as a form of poetics, materiality, law, and subjectivity. Texts will include essays by Aristotle, Burke, Girard, Nietzsche, Hegel, Lukacs, Benjamin, Lacan, Lacoue-Labarthe, Cavell, Althusser, Lyotard, and Kristeva. Although the emphasis will be on theoretical matters, discussions will touch on literary texts central to the essays under consideration.

699 Seminar in the Theories of Directing
Not offered 1983–84; next offered 1984–85.

700 Introduction to Research and Bibliography in Theatre Arts
Fall. 1 credit. Enrollment limited to students in Theatre Arts 633 or 636. Fall, R 2:30–5. M. Hays; spring, T 2:30–5. S. Williams.
A study of methods and materials relevant to the solution of problems in theatre arts, including introduction to standard research sources, problems of translation, and preparation of theses and publications.

880 Master's Thesis

990 Doctoral Thesis and Special Problems

Related Courses in Other Departments

The Greek Experience (Classics 211)
The Roman Experience (Classics 212)
Japanese Noh Theatre (Comparative Literature 400 and Asian Studies 400)
Shakespeare (English 227)
Introduction to Drama (English 272)
Shakespeare (English 327)
Seminar in Shakespeare (English 427)
Elizabethan and Jacobean Drama (English 428)

Contemporary American Theatre (English 455)
Schiller (German Literature 354)
German Drama after 1945 (German Literature 438)
Opera (Music 274, 374, and German Literature 374)

Ukrainian
See Modern Languages, Literatures, and Linguistics, p. 169.

Vietnamese
See Modern Languages, Literatures, and Linguistics, p. 169.

Special Programs and Interdisciplinary Studies

Africana Studies and Research Center
J. Turner, director; Y. Ben-Jochannan, W. Cross (director of undergraduate studies), 310 Triphammer Road, 256–425). M. Evans, L. Edmonson, A. Graves, R. Harris (on leave 1983–84); C. Mbata, A. Nanji
The Africana Studies and Research Center has a unique and specialized program of study that offers an undergraduate degree through the College of Arts and Sciences and a graduate degree. Master of Professional Studies (African and African-American), through the University's Graduate School.
The purpose of the program is to prepare students for professional careers relevant to the learning and leadership of the African-American community. It envisions that the knowledge and methodology of various fields and disciplines will be brought to bear upon the history, present state, and dynamics of the black people and cultures in the Americas, Africa, and the Caribbean. The curriculum is designed to reflect a multidisciplinary approach to the experience of African peoples throughout the world. Africana Center courses are open to both majors and nonmajors.

The Africana Major
The undergraduate major offers interdisciplinary study of the fundamental dimensions of the Afro-American and African experiences. Because of the comprehensive nature of the program, it is to the students' advantage to declare themselves Africana majors as early as possible. The following are prerequisites for admission to the major.

Students should submit:
1) a statement of why they want to be an Africana studies major;
2) a tentative outline of the area of study they are considering (African or Afro-American) for the undergraduate concentration; and
3) a full transcript of courses taken and grades received.
The Africana Center undergraduate faculty representative will review the applications and notify students within two weeks of the status of their request.

After acceptance as a major in the Africana Center, a student must maintain a C+ cumulative average in the center's courses while completing the major program. The Africana major must complete 36 credits in courses offered by the center, to include the following four core courses: AS&RC 231, 290, 360, and 431. Beyond the core courses, the student must take 8 credits of center courses numbered 200 or above and 15 credits numbered 300 or above. Within this selection the student must take at least one of the following AS&RC courses: 203, 204, 283, or 301. The program of an undergraduate major may have a specifically Afro-American focus or a specifically African focus.

Joint Majors
The center encourages joint majors in the College of Arts and Sciences and in other colleges. Joint majors are individualized programs that must be worked out between the departments concerned. The center's undergraduate faculty representative, Professor Cross, will assist students in the design and coordination of joint major programs. However, in any joint major program the center will require at least 15 credits be taken in Africana studies courses, including AS&RC 290.

Double Majors
In the case of double majors (as distinct from joint majors) students undertake to carry the full load of stipulated requirements for a major in each of the two departments they have selected.

Honors
The honors program offers students the opportunity to complete a library research thesis, a field project in conjunction with a report on the field experience, or a project or experiment designed by the student. The requirements for admission to the honors program for all students—majors, joint majors, and double majors—are a B– cumulative average in all courses and a B+ cumulative average in the center's courses. Each student accepted into the honors program will have an honors faculty committee consisting of the student's adviser and one additional faculty member, 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:

History: AS&RC 203, 204, 231, 283, 344, 350, 360, 361, 370, 381, 405, 460, 475, 483, 490.

Note: Students who are not AS&RC majors may petition to satisfy a second requirement with center courses if they are carrying a heavy program at the center.

Language Requirement
Swahili fulfills the College of Arts and Sciences language requirement. Successful completion of AS&RC 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.

131 Swahili
Fall 4 credits.
123 Swahili Spring. 4 credits. Prerequisite Swahili
131 or previous study of the language.
Elementary reading and continuation of grammar.

133 Swahili Fall. 4 credits. Prerequisites: Swahili
131 and 132.
A. Nanji.
Advanced study in reading and composition.

134 Swahili Spring. 4 credits. Prerequisites:
Swahili 131, 132, and 133 or permission of
instructor.
Designated to promote clear and effective
writing skills, using black-oriented materials as
models for writing assignments and oral
discussions.

137 Afro-American Writing and Expression
Fall. 4 credits.
Topics
Fall. 4 credits.
Spring. 4 credits.

180 African Political Systems
Fall. 4 credits.
Survey of key psychological dimensions of the black
experience, covering such issues as (1) race and
intelligence, (2) black identity, (3) black family
structure, (4) black-English; (5) black middle class;
and (6) nature of black psychology.

171 Infancy, Family, and the Community
Fall 4 credits.
A study of black children, including an analysis of
the literature as it pertains to black life from 1950 to the present. Students write a
paper about their own experiences with black
children.

219 Issues in Black Literature
Fall. 4 credits. Not offered 1983-84.
A study of black literature written for black children,
including an analysis of the literature as it pertains to
black life from 1950 to the present. Students write a
paper about their own experiences with black
children.

231 Black Political Thought In the United States
Fall. 3 credits.
This is an introductory course that will review and
analyze the major political formulations developed
and espoused by black people in the struggle for
liberation. Such themes as slave resistance, nationalist,
Pan-Africanism, emigration, anti-
imperialism, socialism, and the political thought of
black women will be discussed. Black political
thought will be viewed in its development as
response to real conditions of oppression and
exploitation.

283 Black Resistance: South Africa and North
America
Fall. 4 credits. Not offered 1983-84.
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
trough which students can cultivate their interests in
dramaturgical criticism 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.
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 Africans Center.

301 Seminar: Psychological Aspects of the Black
Experience
Spring. 4 credits. Prerequisite: permission of
instructor.
Existing research is used to raise specific questions
about new cultural political awareness in the black
community. The focus is on individual conversion
eriences within the context of social movements.
The transformations of political groups (for example,
Black Panther party) and outstanding activists and
intelectuals (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 in alternate years; not offered 1983-84.
Spring. 3 credits. Offered in alternate years; not offered 1983-84.

303 Blacks In Communication Media and Film
Workshop
Spring. 3 credits. Not offered 1983-84.
The focus is on the general theory of
communications, the function of media in an
industrialized society, and the social, racial, and class
values implied in the communication process. There are
group writing projects, a term paper, and the
screening of significant American and Third World films.

344 Neo colonization and Government in Africa
(The Politics of Public Administration)
Fall. 4 credits.
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 internal characteristics
of bureaucratic organizations in Africa and of their
relationship to their social and political environments.

345 Afro-American Perspectives in Experimental
Psychology (also Psychology 345)
Spring. 3 or 4 credits.
Prerequisite: Introductory course in psychology or ASARC 171. Offered alternate years.
L. Fitzgerald.

346 African Socialism and Nation Building
Spring. 4 credits.
An exploration and critical analysis of the various
theories of African socialism as propounded by
theorists and practitioners. Those ideas, extending
from Nyerere's Ujamaa (for example, traditional social
and economic patterns of African society) to
Nkrumah's scientific socialism (such as the desirability and practicality of the Marxian
type of socialism in Africa) are compared.

350 The Black Woman: Social and Political
History
Fall. 3 credits. Not offered 1983-84.
T R 12:20-2:30
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 1980s. 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, Malcolm X, Angela Davis), the emergence of
black feminism, and the various social-political
controversies surrounding the relationship between
black women to both the civil rights and black power
movements.

351 Politics in the Afro-Caribbean World: An
Introduction
Fall or spring, according to demand.
4 credits.
L. Edmonson.
A study of the social, political, economic, and
psychological forces that have shaped Caribbean
societies.

352 Pan-Africanism and Contemporary Black
Ideologies
Spring. 4 credits. Not offered 1983-84.
A historical study of black protest movements and reviews and analyzes the literature and activities of early black
Pan-African theorists and movements.

360 African Nationalism and Civilizations
Fall. 3 credits.
An introduction to African history beginning with early
civilizations in pre-European Africa.

361 Afro-American History (from African
Background to the Twentieth Century)
Fall. 3 credits.
M W F 1:10-11.
Designed to explore major themes of the black
historical experience in America from African origin to
the twentieth century. A major concern is the
changing status of black people over time and their
attempts to cope with bondage, racism,
circumscription, and oppression.

370 Afro-American History: The Twentieth
Century
Spring. 3 credits.
M W F 12:20-1:10.
An exploration of major themes of the black historical
experience in America during the twentieth century.
The socioeconomic, political, and cultural condition of
Afro-Americans is assessed after their presence in this
country for more than three hundred fifty years.
425 Advanced Seminar in Black Theatre Fall. 4 credits. 

The course involves the study and production of the total black theatre.

428 Comparative Slave Trade of Africans in the Americas Fall. 3 credits. 


The focus is on eighteenth- and nineteenth-century slave societies in Virginia and South Carolina in North America and the eighteenth-century slave societies in San Domingue or Haiti and to some extent in Jamaica. The slave society in Cuba during the latter part of the nineteenth century is studied.

431 History of Afro-American Literature Fall. 4 credits. 

M. Evans. 

An extensive examination of the impact that Afro-American literature has had on describing, explaining, and projecting the Afro-American experience from 1619 to the present.

432 Modern Afro-American Literature Spring. 4 credits. 

M. Evans. 

A study of fiction by black writers, focusing on the political and sociological component that influenced the development and growth of black writing in relationship to literary themes and attitudes current in specific periods and movements from post-World War II to the present.

435 History of African Origins of Major Western Religions Fall or spring. Not offered fall 1983-84. Prerequisite: sophomore status or permission of instructor. 

Y. ben-Jochannan. 

The 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 3:35-4:25. 

A comprehensive analysis of the personalities, ideas, and activities central to the struggle for Afro-American liberation, ranging from eighteen-century figures to the present time. Rebellion, emigration, assimilation, accommodation, protest, cultural pluralism, separation, integration, and revolution are some of the central issues.

483 Themes in African History Fall. 4 credits. Not offered 1983-84. 

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. 


The course examines the history of the African liberation movement from the post-World War II era to the present, focusing as much on the areas already liberated through "revolutionary violence" (Guinea, Mozambique, Angola, Zimbabwe) as on the remaining "stronghold" of domination (South Africa and Namibia).

485 Realism, Social Structure, and Social Analysis Seminar Spring. 4 credits. 


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, and each participant fashions a conceptual framework for application to the materials and evidence of the black experience in America.

498 Independent Study Fall, 499, 499. Spring. Not to be arranged. 

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 a la G. Frank, Walter Rodney, and others. It then takes up the differential content and emphasis on socialist and capitalist 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 9:30-12:05. 

Through a critical examination of the approach, methodology, and philosophy of major writers in this field, such as James W.C. Pennington, George Washington Williams, W. E. B. DuBois, Carter G. Woodson, John Hope Franklin, Benjamin Quarles, Lerone Bennett, Jr., and Vincent Harding, the evolution of Afro-American history is traced from its origin to the present. The nature and purpose of Afro-American history, especially the role of the black historian in the context of a racist and oppressive society, is analyzed. Attention is given to sources for studying black history, and each participant fashion a conceptual framework for application to the materials and evidence of the black experience in America.

515 Comparative Political History of the African Diaspora 4 credits. Prerequisites: upperclass or graduate standing or two of the following courses: AS&RC 203, 204, 283, 360, 361, 475, 484, 490. 

Offered alternate years.

520 Historical Method, Sources, and Interpretation Fall. 4 credits. Prerequisite: upperclass or graduate standing or permission of instructor. Not offered 1983-84. 

Offered alternate years. 

C. Mbata.

550 Transnational Corporations in Africa and Other Developing Countries Spring. 4 credits. 

Prerequisites: upperclass or graduate standing or permission of instructor. Not offered 1983-84. 

Examines the role of transnational enterprises as an economic and political factor in the Third World, their relations with the host government, and their interaction with both the private and public sectors of the economy of the host country. Special emphasis on Africa and Latin America.

551 Political History of Social Development in the Caribbean Offered according to demand. 4 credits. 

Prerequisite: upperclass or graduate standing or permission of instructor. 

L. Edmiston. 

For description see AS&RC 351.
American Indian Studies Program

Raymond Fougnier, director, 215 Stone Hall, 256-6597

The American Indian Studies Program (AISP) is a multidisciplinary, intercollege program consisting of instructional, research, and extension components. The program’s instructional core consists of courses focusing on the 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 AISP 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 Cornell sponsors a Native American Studies Institute and an Indian Teacher Training Program. The institute’s program of instruction covers a broad range of topics relevant to American Indian Studies. The teacher training program provides participants with the skills needed in a bicultural-learning environment.

A specific objective of the AISP is to assist Indian groups and organizations in their efforts to address the issues they face. The thrust of the AISP’s research and extension effort is to develop solutions to problems identified by Indian people. In this way the AISP 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 protohistoric Iroquois dwelling. This project is intended to facilitate the understanding of Iroquois culture by providing a study center that will serve the residents of central New York State. Advisers from the Iroquois community are assisting the AISP 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 assisting 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 adviser from the program.

Introduction

ALS 100 Introduction to American Indian Studies Fall. 3 credits. TR 10:10 R. Fougnier. This course provides a foundation for the study of the American Indian. Emphasis will be placed on the social, cultural, historical, educational, and human development of American Indians. Guest lecturers from the Cornell staff and the Indian community will be called to broaden the scope of the course.

The Indian Traditions

Anthropology 230 Ethnology of Native North America Fall. 4 credits. M W F 1:25. B. Lambert. A general survey of the ethnography of North America, with emphasis on problems and topics to which the Native American materials are most relevant. Selected cultures will be considered in some detail.

Anthropology 354 The Peopling of America Fall. 4 credits. M W F 9:05. T. Lynch. A study of the prehistoric cultures of the New World. Major topics include the entry of man, early adaptations to diverse environments, hunting and gathering people to the ethnographic present, and the beginnings of agriculture.

Indians in Transition

History 119 History of North American Indians Spring. 3 credits. Prerequisite: permission of instructor. R 2:30-4:25. 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 209 Political History of American Indians Not offered 1983-84. An investigation of political organizations and evolution among Native American tribes. Disciplines 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, colonial policies and treaties, federal-state-tribal sovereignty, and Indian strategies of autonomy and resistance through the wars.]


History 429 American Indians in the Eastern United States Spring. 4 credits. TR 10:10-12:05. D. Usner. A seminar examining the history of Native Americans east of the Mississippi River from the colonial era to the present. The cultural and economic participation of American Indians in the evolution of frontier societies as well as the impact of Indian/non-Indian relations on tribal societies will be studied. Major topics include fur-trade networks, political alliances, warfare, resistance against removal, and the persistence of Indian communities within eastern states.

Anthropology 318 Ethnohistory of the Northern Iroquois (also ALS 318) Spring. 3 or 4 credits. TR 2:30-3:45. S. Saraydar. The development of Northern Iroquoian cultural patterns is examined in depth from the prehistoric Woodland period to the present day. Archaeological and ethnographic data are critically evaluated and combined both to trace the history of the Iroquois people and to enable their cultural ecology to be reconstructed. Some fundamental information is drawn from accounts of neighboring groups in southern Ontario and western New England to provide a regional perspective and to fill gaps in the chronicles of the early-contact period.

Contemporary Issues

Rural Sociology 175 Issues in Contemporary Native American Societies Spring. 3 credits. TR 10:10. R. Fougnier. Native American people are confronted with a myriad of special circumstances that impinge upon their everyday lives. The purpose of this course is to present background to these issues and give perspective from a Native American point of view. Early history and the postcontact period will be reviewed with an emphasis given to recent developments. Topical areas covered will include treaties, education, and human rights, social problems, militant organizations, and civil rights will be covered with guest lecturers and media presentations.

Anthropology 242 American Indian Philosophies I (also Rural Sociology 242) Fall. 3 credits. T R 2:30-3:45. S. Saraydar. This course is designed to facilitate an understanding of the world views of American Indians of the past and present. The philosophies of contemporary figures such as lame Deer, Deloria, Momaday, and the enigmatic don Juan are evaluated along with those of Black Elk, Handsome Lake, and other Indians of earlier times. The goal is to provoke edifying discourse that will enable American Indian beliefs concerning the workings of the universe and the relationships of human being to nature to be understood on their own terms.

Anthropology 367 American Indian Tribal Governments (also Rural Sociology 337) Fall. 3-4 credits. Prerequisites: ALS 100 or Anthropology 230 or consent of instructor. W 7:30-9:55 p.m. S. Saraydar. This course focuses on Indian political systems 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 relations of tribal governments to federal and state governments.

Anthropology 442 American Indian Philosophies II (also Rural Sociology 442) Spring. 4 credits. W 7:30-9:25 p.m. plus additional sessions to be arranged. S. Saraydar. This course provides an opportunity for students to pursue topics of interest from American Indian Philosophies I 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.

[Rural Sociology 440 The Social Impact of Rapid Resource Development Not offered 1983-84. The term is defined by impact assessment (SIA) and identifies alternative models of doing social-impact assessment and the experience various rural minorities have had with SIA, especially American Indians. Students will learn certain practical research skills needed in doing SIA and will participate in a SIA simulation in rural New York.]
**Independent Study**

Students who want to sign up for independent study as part of the concentration must have the approval of an American Indian studies faculty member. Independent study courses within departments will be used for this purpose.

**Biology and Society**

Prof. John L. Ford, chairperson; Frederick H. Buttal, vice chairperson, 632 Clark Hall, 256-3810

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, ethics, and public policy, as well as for students who plan postgraduate study in management, health, medicine, law, or other related fields.

**The Major**

Because the biology and society major is multidisciplinary, students must attain a basic understanding of each of the several disciplines it comprises, including introductory courses in the fields of biochemistry, chemistry, mathematics, genetics, ecology, ethics, and history. In addition, majors are required to take a two-semester core sequence in biology and society, a set of electives, and a special senior seminar. Programs incorporating these required courses are designed in consultation with faculty advisers 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, contact Professor John L. Ford, Program on Science, Technology, and Society, 632 Clark Hall.

**Honors**

(for students in the College of Arts and Sciences only)

**Basic requirements.** The basic requirements for a Bachelor of Arts with honors for students majoring in biology and society shall be: (1) a seminar (4 credits) taken during the first semester of the senior year; (2) a tutorial (4 credits) taken during the second semester of the senior year; and (3) a satisfactory honors thesis written in conjunction with the seminar and tutorial and satisfactorily defended. Students wishing to pursue an honors program must declare their interest by the time of registering for their first-semester honors seminar. The honors seminar may be one of the regular biology and society senior seminars specially adapted for the development of an honors thesis.

Candidates for the degree of Bachelor of Arts with honors in biology and society must (1) submit an application to the chairperson of the major, explaining how the honors thesis is expected to fit into the candidate's undergraduate program, and (2) have an average of B in all subjects and B+ in biology and society courses.

**The honors thesis.** Work on the honors thesis shall begin in the honors seminar with the preparation of an outline and bibliography and shall be completed in the honors tutorial. An honors thesis outline and bibliography shall be submitted prior to the beginning of the final examination period of the first semester, a polished first draft at least five weeks prior to the final examination period of the second semester.

The honors thesis shall be written under the direction of two honors thesis faculty advisers. Candidates for honors shall first find a member of the Biology and Society Major Committee willing to serve as an adviser, and the student and this adviser shall then find a second adviser from among the faculty at large. The purpose of a second adviser is to guarantee expertise in the subject matter covered by the thesis.

When a thesis has been completed in a form generally satisfactory for purposes of evaluation, the candidate shall meet with the thesis advisers and formally defend it.

**Evaluation and recommendation.** Following the formal defense of the thesis, the thesis adviser shall submit to the chair of the Major Committee a recommendation regarding the level of honors to be awarded. This recommendation shall include: (1) an evaluation of the thesis, (2) a statement of the student's academic record in the biology and society major; and (3) a justification for the level of honors proposed. This recommendation shall be circulated to the members of the Biology and Society Major Committee for information and ratification. Unless there is serious disagreement, the recommendation of the advisers shall stand. If there is serious disagreement, the chairperson of the committee shall take the decision after consultation with the interested parties.

**Freshman Seminars**

100 Ways of Seeing
Fall or spring. 3 credits.
M W F 10:10-10:50, S. Siskin.
We can and do see in the physical world—and how we communicate it to others—is influenced by our visual system, culture, experience, interests, and values. In this course we will survey these influences as they bear on vision in everyday life, visual art, and imaginative literature. Our survey will be based on readings in science, art history and criticism, and literature and on slides of works of art. Note: Although we will study the visual system in some detail, no special scientific background is necessary for the course.

102 Hard Choices (also Sociology 100.5)
Fall. 3 credits.
M W F 11:15-12:05, 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 base 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 values the dilemma for science, medicine, engineering, universities, and society. Discussion will be based on readings in drama, fiction, and philosophy and on debate over such issues as genetic engineering.

103 Writing as a Naturalist
Fall. 3 credits.
M W F 12:20-1:35, A. Boehm.
This course is about the complex relation between human consciousness and culture, and theologians and environmentalists, as well as 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 By, Farley Mowat, and Christopher Stone.

**General Undergraduate Courses**

214 The Biological Basis of Sex Differences (also Women's Studies 214 and Biological Sciences 214)
Spring. Prerequisite: one year of introductory biology.
Lecs, T R 10:10-11:30; 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. This semester covers the period from classical antiquity to 1900.

287 History of Biology (also History 287 and Biological Sciences 201)
Fall. 3 credits.
Prerequisite: one year of introductory biology. S-U grades optional.
Lecs, T R 10:10-11:30; 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. This semester covers the period from classical antiquity to 1900.

301 Biology and Society I: The Biocultural Perspective (also Anthropology 301 and Biology and Society 301)
Fall. 3 or 4 credits (4 credits with discussion section). Prerequisite: one year of introductory biology. S-U grades optional.
Lecs, T R 10:10-11:30; W. Swazey.
This course is part of the two-semester core sequence for the biology and society major and is also available to other students who have fulfilled the necessary prerequisite.

302 Alternative Food Production Systems (also Biological Sciences 302)
Spring. 3 or 4 credits (4 credits by arrangement for nonmajors). Prerequisite: Anthropology/Biology and Society/Biological Sciences 301 or permission of instructor. S-U grades optional.
This is one of two courses fulfilling the second-semester core sequence requirement for the biology and society major and is also available to other students who have taken 301.

310 Issues in Biology and Society: Chemicals, Enzymes, and Molecules
Fall. 4 credits (3 credits by arrangement with instructor). Prerequisite: Anthropology/Biology and Society/Biological Sciences 301 and a biochemistry course or permission of instructor. This is Biology and Society 302 fulfills the second-semester core course requirement for the biology and society major and is also available to other students who have taken 301.

Lecs and disc, T R 10:10-11:30; J. Fessenden-Raden.
The biochemical effects of toxic chemicals as potential health hazards will be examined from a multidisciplinary perspective. Scientific, social, public policy, and ethical issues will be critically analyzed. Topics include occupational and environmental chemical hazards within a biochemical examination of the role of specific chemicals such as carcinogens, allergens, mutagens or teratogens. Chemical ethics will also be discussed. Lectures with assigned readings will be followed by a discussion period.

311 Issues in Biology and Society: Professional Ethics Spring. 4 credits. Limited to 20 students. R 2:30-4:30. S. Brown, Jr. An examination of the role of professions in our society and a comparison of the setting of professional 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 or permission of instructor. R 2:30-4:30. D. Greenwood, D. Holmberg. An examination of contemporary medical systems from an anthropological perspective and an evaluation of current approaches to the anthropology of medicine.

347 Human Growth and Development: Biological and Social Psychological Considerations (also Human Development and Family Studies 347) Spring. 3 credits. Prerequisites: Biological Sciences 101 or 105 or equivalent, Human Development and Family Studies 115 or Psychology 101 and Nutritional Sciences 115 or equivalent. M W 1:25-2:15. J. Haas, H. Ricciuti. A review of major patterns of physical growth from the fetal period through adolescence, with consideration of biological and 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 in growth (normal and atypical).

375 Independent Study Fall or spring. Credit to be arranged. Hours to be arranged. Staff.

Senior Seminars (Biological and Society 400-408)

400 Seminar in the History of Biology (also History 447) Fall. 4 credits. No prerequisites. T 2:30-4:25. W. Provine. Scientific method, creativity, and discovery, viewed from the perspective of the history of biology. Special emphasis will be placed upon the role of aesthetics in biological research.

401 Population Policies (also Sociology 531) Fall. 4 credits. Prerequisite: graduate standing or permission of instructor. W 3:35-5:30. J. M. Stycos. The ways in which societies try to affect demographic trends. Special focus is on government policies and programs to influence fertility.

402 The Ecological Consequences of Nuclear War (also Peace Studies 402) Fall. 4 credits. Prerequisite: Biological Sciences 260 or 360, or Government 312 or 384 or permission of instructor. Not offered 1983-84. M. Harwell.

403 Seminar in the History of Biology (also History 448) Spring. 4 credits. No prerequisites. T 2:30-4:30. W. Provine.

The warfare between science and religion from Galileo to the present. Eminent Cornelianns from Andrew Dickson White to Frank H. T. Rhodes will be represented in the readings.

405 The Social Functions of Law and Medicine Spring. 4 credits. Limited to 15 students. Prerequisite: Biology and Society 311 or 301 or permission of instructor. T 2:30-4:25. L. I. 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 doctor-patient interactions, the social aspects of physician-patient interactions, the effect of medical malpractice on health care delivery, legal issues in the care of the newborn, and health care decisions for incompetents and terminally ill patients.

406 Special Problems in the Anthropology of Sex and Gender (also Anthropology 422 and Women's Studies 422) Fall. 4 credits. R 2:30-4:25. R. E. March. Each year this seminar focuses on a particular area in the anthropology of sex and gender, building on work done in Anthropology/Women's Studies 321. The topic for fall 1983 is issues of sexual development. The seminar will look at the integration of women into development planning and projects: the confrontation between the feminisms of developing and developed countries, political rights and participation, land reform, credit, agricultural extension services, technological change, small and landless farmers, migration, informal marketing, domestic service, cottage industry, multinational industry, legal reform, education, family planning, fertility, and infant formulas. Overall, the seminar pivots around the question of how much Western sexual and family development can be considered as preconceptions about the place of men and women in the public sector, lie at the heart of Western models for development intervention.

408 Genetic Engineering, Technological Change, and Agriculture (also Rural Sociology 405) Fall. 3 credits. Prerequisites: two courses each in the agricultural or biological sciences and social sciences. S-U grades optional. Lecs, W 1:25-4:25. F. Buttel. An examination of socioeconomic aspects of biotechnology in the context of historical patterns of technological change in agriculture in developing and developed countries. Background is provided on scientific aspects of biotechnology, and the major topics covered include the social organization of genetic engineering research, industry-university relationships, and the impacts of genetic engineering on agriculture.


The China-Japan program includes faculty members who have a commitment to teaching and research on China or Japan. Students who have a commitment to teaching and research on China or Japan may do so by enrolling in a term; for up-to-date information, students should contact the director or any staff member of the China-Japan Program. For more information about the China-Japan Program and its requirement, see p. 15.

Freshman Seminar Program F. V. Bogle, director, 139 Goldwin Smith Hall, 256-4061. K. K. Gottschalk, assistant director

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, social sciences, expressive arts, and, occasionally, the sciences. 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 eighteen students. The following courses are Freshman Seminars. Since, however, Freshman Seminar offerings sometimes vary from semester to semester, the following should be considered only as representative of the kinds of courses usually offered in a term; for up-to-date information, students should consult the Freshman Seminar brochure available from college registrars before fall and spring registration. For more information about the Freshman Seminar Program and its requirement, see p. 15.

Africana Studies

For full descriptions of the following courses see Africana Studies and Research Center, page 200
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, and philosophy and on debate over such issues as genetic engineering.

103 Writing as a Naturalist
Fall. 3 credits. T R 12:20-1:35. A. Brodsky
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 by 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 Three Ways of Thought
Fall and spring. 3 credits.

105 The Hero in Literature
Fall and spring. 3 credits.
Classics
For full descriptions of the following courses see Classics, p. 117.

120 Slave and Free In Ancient Rome
Fall. 3 credits. M W F 11:15. J. Ginsburg

121 Freshman Seminar In Classical Archaeology
Fall and spring. 3 credits. Fall: M W F 10:10; spring: M W F 12:20. D. McGuire

150 Freshman Seminar In Greek and Roman Myths
Fall and spring. 3 credits. M W F 9:05, 1:25, or 2:30. Staff

Comparative Literature
Individual sections of each course may vary. For information about courses and class meeting times in the spring term consult the Freshman Seminar brochure.

102 Tales of Mystery, Quest, and Self-Discovery
Fall and spring. 3 credits.

106 Women and Writing (also Women's Studies 106)

What is a woman? How does she confront her personal experience? Does she play a special role in history, in our definition of society, or in our understanding of language and literature? This course will explore the relation between women and writing. We will discuss writings by and about women, debate our attitudes toward feminism, and analyze the relevance of these questions to our own written work.

Individual sections will emphasize different aspects of the relations between women and writing. Which section to choose should depend on the student's interest in exploring how women appear in private or autobiographical writings, historical contexts, and/or literary works. Further information on specific sections is available in the Women's Studies office and the English department office. Textual overlap among the sections is kept to a minimum so that students can take more than one Women and Writing seminar during their time at Cornell.

108 Writing about Film (also Theatre Arts 108)
Fall and spring. 3 credits.

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
Fall and spring. 3 credits.
Fall: M W F 10:10. R. Bean.
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. 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 probe 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 readings and self-critical accounts of earlier writing assignments.

English
For information about class meeting times for all courses given in the spring and for some that are given in the fall, consult Freshman Seminar Program publications.

105 Women and Writing (also Women's Studies 106)

What is a woman? How does she confront her personal experience? Does she play a special role in history, in our definition of society, or in our understanding of language and literature? This course will explore the relation between women and writing. We will discuss writings by and about women, debate our attitudes toward feminism, and analyze the relevance of these questions to our own written work.

Individual sections will emphasize different aspects of the relations between women and writing. Which section to choose should depend on the student's interest in exploring how women appear in private or autobiographical writings, historical contexts, and/or literary works. Further information on specific sections is available in the Women's Studies office and the English department office. Textual overlap among the sections is kept to a minimum so that students can take more than one Women and Writing seminar during their time at Cornell.

108 Writing about Film (also Theatre Arts 108)
Fall and spring. 3 credits.
averaging five pages in length, and eight to ten short writing assignments. No familiarity with film history or analysis is expected.

115 The State of the Language Fall and spring. 3 credits. MWF 12:20, B. Adams. Readings consist of non-technical essays about the current state of the English language, spoken as well as written, and treat such topics as dialect, slang, jargon, correctness, propriety, perspicuousness, vulgarities, obscurity, vagueness, plainness, precision, and ambiguity. The course is broad in humanistic rationale, rather than specifically literary, linguistic, or philosophical. The required papers are frequent (about one a week), comparatively short (two to five pages each), and for the most part analytical and argumentative.

127 Shakespeare and Politics Fall and spring. 3 credits. Fall: MWF 9:05, or 10:10, or TR 12:20. E. Fogel, R. Sanchez, K. Humphreys, S. Pye. Seven plays, chosen from among such texts as Richard II, Henry IV, Henry V, As You Like It, Measure for Measure, Troilus and Cressida, Julius Caesar, Antony and Cleopatra, Coriolanus, and The Tempest. While considering these works for their literary and dramatic qualities, we will study certain recurring topics: sources of political power or human rights, concepts of civility, conflicts of loyalty (love vs. honor, tradition vs. conformity, stability vs. change), and various ideas of order and rebellion. Students will write eight expository essays on questions raised by our study of the plays. Emphasis falls equally on reading and writing.

133 Forms of the Essay Fall and spring. 3 credits. Fall: MWF 9:05, 10:10, 11:15, or 12:20, or TR 8:40 or 12:20. P. Sawyer and staff. Spring: N. Kaplan and A. Anisfeld. A basic introduction to the writing of essays. How does a writer turn a topic into the kind of finished essay normally required for college courses? How do his aims affect his tone, structure, evidence, and methods of persuading? We will answer these questions chiefly by discussing the students' own work as well as materials from outside—essays, advertisements, articles. Weekly assignments will be three to four pages long with two short research papers.

135 Writing from Experience Fall and spring. 3 credits. Fall: MWF 9:05, 10:10, 11:15, or 12:25, or TR 8:40, 10:10, or 12:20. J. Bishop and staff. Spring: J. Bishop and staff. Designed to give each student an opportunity to write about his or her own experience in an interesting way. Most of the class time and conferences are devoted to reading, discussion, and evaluation of the students' own work.

136 Practical Prose Fall and spring. 3 credits. Fall: MWF 9:05, 10:10, 11:15, or 12:25, or TR 8:40 or 10:10. H. Shaw, G. Teskey, and staff. Spring: S. Elledge and staff. A course in the elements of style in expository writing, for people preparing for careers in fields where success depends on being able to answer questions and write papers with clarity and grace. Frequent short papers (about fourteen) on questions raised by careful analyses of essays by such writers as E. B. White, C. L. Dodgson (Lewis Carroll), T. S. Eliot, F. O. Ellis, G. Orwell, D. Lessing, Carl Sagan, and Henry David Thoreau. Readings for sections vary; for further information, consult the English department, 252 Goldsmith Hall.

141 The Bible and Ancient Authors Fall and spring. 3 credits. TR 10:10-11:15. C. Kaske, TR 12:20-1:30, C. Wright. Reading, discussing, and writing about 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 and spring. 3 credits. MWF 9:05, 10:10, 11:15, 12:20, 1:25, or TR 12:20. F. Bogel. A course in analytical reading and expository writing. We will read selectively from the work of such exemplary moderns as William Yeats, James Joyce, T.S. Eliot, Virginia Woolf, Dylan Thomas, Harold Pinter, William Carlos Williams, Allen Ginsberg, Tillie Olsen, Toni Morrison, and others. The readings will cover the genres of poetry, narrative, fiction, essay, and drama. Our attention will focus on the individual works as part of an experience that, in many ways, is our own. Class time will be divided between the literary works and our written responses to them.

157 American Literature and Culture Fall. 3 credits. MWF 9:05, 10:10, or 11:15, or TR 8:40-9:55 or 12:20-1:25. C. Strout and staff. This course asks students to read and write about the problem of what is American about our classic literary tradition, focusing on selected classic writers and critical essays on the alleged national character of their tradition. Consult Freshman Seminar Program publications for scheduled class times for the following courses.

158 American Literature and Culture Spring. 3 credits. M. Setzer and staff. This course is concerned with the literary expression of American identity in the period following the Civil War. We will explore the changing confrontations between Americans and Europeans, between black and white Americans, and between men and women. Readings include such authors as James (Daisy Miller), Twain (Huckleberry Finn), Chopin (The Awakening), Hemingway (The Sun Also Rises), Faulkner (Light in August), and O'Connor (stories).

165 Fantasy Fall and spring. 3 credits. Fall: MWF 9:05, 10:10, 11:15, 12:20, 1:25, or TR 8:40 or 10:10, R. Kirchsten and staff; spring: T. Murray, M. Hile, and staff. A course in analyzing and writing about the fantastic in literature—the limits of "real experience," the threat of nonsense, confusion, and the grotesque, and the possibility of constructing new worlds through imagination. Readings will include such authors as the Brothers Grimm, Lewis Carroll, Mary Shelley, Poe, and Vonnegut. Students will write approximately one essay on each author.

270 The Reading of Fiction Fall and spring. 3 credits. Register with the English department at Barton Hall, not at Freshman Seminar registration. MWF 10:10-11:15, or 1:25, or TR 10:10-12:20. Fall: R. Marcus, J. Blackall, and staff. Forms of modern fiction, with emphasis on the short story and novel. Critical studies of works by English, American, and continental writers from 1880 to the present—Bellow, Chekhov, Conrad, Faulkner, Mann, Kafka, Joyce, and others. Students will write several short critical essays totaling approximately thirty pages. This course is open to sophomores and to freshmen who have taken a Freshman Seminar or who have three English A.P. credits. It may be used to satisfy either the humanities requirement or the Freshman Seminar requirement, but not both. Recommended for English majors.

271 The Reading of Poetry Fall and spring. 3 credits. Register with the English department at Barton Hall, not at Freshman Seminar registration. MWF 1 25 or TR 10 10, J. Stillworthy, C. Levy, spring; staff. Designed to sharpen the student's powers to understand and respond to poetry. Readings in the major periods, modes, and genres of poetry written in English. Students will write several short critical essays totaling approximately thirty pages. This course is open to sophomores and to freshmen who have taken a Freshman Seminar or who have three English A.P. credits. It may be used to satisfy either the humanities requirement or the Freshman Seminar requirement, but not both. Recommended for English majors.

116 An Introduction to Drama Fall and spring. 3 credits. Register with the English department at Barton Hall, not at Freshman Seminar registration. Fall: MWF 11:15 or 1:25, A. Caputi, R. Farrell, spring: T. Murray. A study of selected masterworks by such playwrights as Sophocles, Ibsen, and Shaw to introduce the student to the chief idioms and styles of the Western dramatic tradition. The work will consist of discussions and papers as well as a special project related to the plays being produced by the Department of Theatre Arts. The course is open to sophomores, and to freshmen who have taken a Freshman Seminar or who have three English A.P. credits. It may be used to satisfy either the humanities requirement or the Freshman Seminar requirement, but not both. Recommended for English majors.

German Literature For full descriptions of the following courses see German Literature, p. 157. For spring class schedules see Freshman Seminar publications.

109 Folk Tales and Folk Poetry Fall and spring. 3 credits. Fall: MWF 9:05 or TR 8:40. I. Ezeragulias, V. Healy, P. Nelson, D. Rush.

151 Kafka, Hesse, Brecht, and Mann Fall and spring. 3 credits. Fall: T R 8-40-9:55. B. Foust, E. Reeves.

211 Intensive Workshop in German Studies for Freshmen Fall. 1 credit. 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 but not both. T R 2:30-4:30. H. Deinert.

Government For descriptions of Freshman Seminars offered in the spring by the Department of Government consult the Freshman Seminar brochure.

100.1 International Energy Problems and Interdependence Fall. 3 credits. T R 10:10. L. Schenman. This seminar will examine international energy problems in the context of the concept of interdependence. Attention will be given to the roots of the energy problem and to the evolution of energy sources 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.

100.2 The Empire Strikes Back: Assessing the Myth and Reality of the Japanese Challenge Fall. 3 credits. MWF 9:05, H. R. Friman. Is Japan economic evil incarnate, the new #1 to be emulated by the rest of the world, or just a scapegoat for U.S. economic problems? We will examine the United States–Japan relations in light of recent trade disputes between the two countries. Emphasis will be placed on analyzing Japan's "economic miracle," Japan, Inc., Japanese business techniques, domestic political constraints on economics in the U.S. and Japan, and the international implications of U.S.–Japan trade friction.
manifestations, "Islamic revolution" in Iran and "Islamization" of the state in Pakistan. We will concentrate on the following questions: What are the causes and nature of Islamic resurgence? Is it a purely religious revival or a social and political movement that should be understood in the context of economic and social conditions of Muslim countries? What are the social classes to whom Islamic groups appeal the most? Will this resurgence lead to the establishment of an Islamic sociopolitical order, or will it become just another instrument of struggle between Muslim ruling elites and their opposition? Finally, if the Islamic sociopolitical goal is achieved, what would be its implications for women's rights, for foreign policy, and for political and economic development of these countries? 

100.10 The Military as Government Fall. 3 credits. 
M W F 11:15. C. Schneider. 
In the Western world, civilian governments appear to be the norm, yet in many parts of the world it is the armed forces that rule. What happens when soldiers become rulers? In this course we will look at a variety of countries in which the military has assumed power and examine the effects of the military's ascent to power on social and political institutions, the society as a whole, and the military itself. 

History 
104 Communes and Utopias: Alternative Life Styles in American History Fall. 3 credits. Limited to 15 students. 
105 Freshman Seminar: The Growth of Political Democracy in the United States Fall. 3 credits. Prerequisite: permission of instructor. 
106 Democracy and Education: History of Learning in America Spring. 3 credits. 
119 History of North American Indians Spring. 3 credits. Prerequisite: permission of instructor. 
143 Family and Community in Modernizing Societies Spring. 3 credits. 
M 10:00-11:25. N. Schwartzbach. 
160 The Politics of Natural Man Spring. 3 credits. 
176 Britain and the Second World War Spring. 3 credits. Prerequisite: permission of instructor. 
193 China and the West before Imperialism Spring. 3 credits. Open to freshmen and sophomores. Prerequisite: permission of instructor. 

History of Art 
For full descriptions of the following courses see History of Art, p. 144. 
103 Freshman Seminar In Visual Analysis Fall or spring. 3 credits. 

Hotel Administration 
For a full description of the following course see Hotel Administration, Communication Courses, p. 269. 
165 Introduction to Writing for Business Fall and spring. 3 credits. Each section limited to 20 students. 

Medieval Studies 
For full descriptions of the following courses and for spring class schedules see Medieval Studies, p. 211. 
101 The Literary Adventure of the Middle Ages Fall and spring. 3 credits. 
102 King Arthur and His Knights Fall and spring. 3 credits. 

Modern Languages and Linguistics 
English 
For a full course description see Modern Languages, Literatures, and Linguistics, English, p. 153. 
215–216 English for Later Bilinguals 215, fall; 216, spring. 3 credits each term. Not designed for students whose schooling has been entirely in English. 
M W F 2:30. M. Martin. 

Linguistics 
For a full course description see Modern Languages, Literatures, and Linguistics, Linguistics, p. 162. 
113-114 Hispanic Bilingualism 113, fall; 114, spring. 3 credits each term. Linguistics 113 is not a prerequisite for 114. 

Music 
For a full course description see Music, p. 170. 
111 Sound, Sense, and Ideas Fall or spring. 3 credits. 
M W F 10:10 or 11:15. W. Schneider, C. Clark. 
Near Eastern Studies 
For full descriptions of the following courses see Near Eastern Studies, p. 173. 
[125 Freshman Seminar in Biblical Literature: Heroes and Heroines of the Bible Fall. 3 credits Not offered: 1983-84.] 
154 Harems, Houriya, and Hashshash: Western Perceptions of the Middle East Spring. 3 credits. Consult Freshman Seminar Program publications for times. D. Powers. 
157 Of Oil, Arms, and Anguish: Aspects of Modern Arab Thought Fall. 3 credits. 

Philosophy 
For descriptions of Philosophy 100.1, 100.3, 100.4, 100.5, 100.7, and 100.8 consult the Freshman Seminar Program brochure. Past topics have included Contemporary Moral Problems, Economic Justice, Science and Pseudo-Science, The Nature and Existence of God, Theories of the Mind, Objectivity and Reality in Scientific Theorizing, among others. 

Special Programs and Interdisciplinary Studies 207
100.2 Dialogue and Dialectic Fall. 3 credits M W F 11:15. R. Stainaker
Beginning with Plato, many philosophers have chosen to write philosophy in dialogue form. In this seminar we will read a number of philosophical dialogues, both ancient and modern, as well as some philosophy written in contrasting forms. We will be concerned both with substantive issues discussed in the dialogues and with the role of the form in helping to bring out the dialectic of the arguments. Students will write about six short papers, some of them dialogues. Readings will be from Plato, Berkeley, Hume, and some contemporary writers.

100.6 Some Puzzles Fall. 3 credits. T R 10:10. C. Ginét.
We will discuss five or six of the following well-known puzzles: Zeno’s Paradoxes of Motion (the Racecourse, the Arrow, the Stadium), the Paradox of the Heap (or Sorites Paradox), the Paradox of the liar, the Hangman’s Paradox (or the Paradox of the Surprise Examination), the Prisoner’s Dilemma, and Newcomb’s Problem. They involve reasoning that is paradoxical in the sense that it seems clear there must be something wrong with the reasoning but it is very hard to say what is wrong. Besides being an intriguing exercise in itself, the study of such puzzles can show us interesting and important things about some of our basic concepts, such as those of space, time, motion, truth, knowledge, rational choice, and causation.

Psychology

119 The Psychology of Persuasive Communication Fall and spring. 3 credits. T R 12:20-1:35. S. Matteo.
This course is designed to help students improve their writing skills while they learn about the process of attitude formation and attitude change. In addition, the course requires that students learn and use SCRIPT, a computer-based word-processing system available at Cornell. Topics chosen for discussion will provide a survey of current theoretical and experimental approaches to the relationship between attitudes and behavior. Specific issues include the effects of advertising on consumer behavior, juror attitudes on trial outcome, political persuasion on voting, and racial-sexual prejudice on employment practices.

Romance Studies

For a full description of the following course see French Literature, p. 154.

109 Techniques of Interpretation: An Introduction to Semiotics (also French 109) Fall and spring. 3 credits. T R 8:40-9:55. K. Lockhart.

Russian Literature

103 Freshman Seminar: Classics of Russian Thought and Literature Fall and spring. 3 credits each term. T R 12:20-12:50. P. Sulzman.
Emphasis is on connections between Russian literary masterpieces and their historical background. The seminar covers both nineteenth- and twentieth-century works. Readings in English translation of Dostoevsky, Solzhenitsyn, and others.

104 Freshman Seminar: Nineteenth-Century Russian Literary Masterpieces Fall and spring. 3 credits. M W F 9:05 or 12:20. P. Carden, L. Carani.
Readings in English translation of works by Dostoevsky, Tolstoy, and others; limited to nineteenth-century authors. A slightly more literary and less historical course than Russian 103.

105 Freshman Seminar: Twentieth-Century Russian Literary Masterpieces Fall and spring. 3 credits.

208 Arts and Sciences

T R 2:30-3:45. C. Ruder.
Readings in English translation of works by Babel, Pasternak, Solzhenitsyn, and others, studied against the background of Soviet social and political developments.

Society for the Humanities

For full descriptions of the following courses see Society for the Humanities, p. 212.


Sociology

For full descriptions of the following courses see Sociology, p. 168.

100.1 Science in Society: A Sociological Perspective Fall. 3 credits. Not offered 1983-84.

100.2 The Social Order in Detective Fiction Spring. 3 credits. M W F 8:40. S. Caldwell.

100.3 Sociology of Organizations Spring. 3 credits.

100.5 Hard Choices (also Biology and Society) 102 Fall and spring. 3 credits. M W F 11:15. S. Siksin.

105 Opinion-Forming Institutions Fall. 3 credits. R. K. Goldsen.
The unifying topic of the seminar is the societal impact of mass media. Focus of attention is how to study, observe, understand, and write about them.

109 Social change Fall. 3 credits. T R 2:30. B. Rubin.

Theatre Arts

For full descriptions of the following courses see Theatre Arts, p. 194.

108 Writing about Film (also English 108) Fall and spring. 3 credits. T R 12:20-1:35. Fall: H. Knodle; spring: staff.

120 Writing about the Modern Theatre Spring. 3 credits.

140 From Script to Stage: Writing about the Theatrical Process Fall and spring. 3 credits. Fall: M W F 9:05 or 1:25, spring: M W F 9:05. Staff.

Women’s Studies

See Freshman Seminar brochure.

Writing

137-138 Workshops in English Composition 137, fall; 136, spring. 3 credits each term. S-U grades only. Hours to be arranged. N. Kaplan, D. Crabtree, K. Hjortshoj, 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 group sessions and in individual conferences. 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.

Human Biology Program

J. Haas (nutritional sciences), director, N206 Martha Van Rensselaer Hall; T. F. Dressen-Hudson (anthropology), B. Finlay (psychology), G. Haufsater (neurobiology and behavior), J. Fortune (physiology/women’s studies), R. Johnston (psychology), K. A. Kennedy (ecology and systematics), D. Luskin (nutritional sciences), R. Savin-Williams (human development and family studies)

Human Biology integrates the methods and theories of many disciplines, such as biological anthropology, nutrition, neurobiology, psychology, demography, ecology, genetics, and paleoanthropology, into a comprehensive study of biological diversity in Homo sapiens. A central focus of this interdisciplinary approach to the study of the human organism is an understanding of evolutionary processes that explain our biological variation through space and time. The program of study seeks to educate future biological scientists to address the concerns of a society that is becoming more dependent on the scientific community to place its specialized biological knowledge into a broad context. The human biology curriculum is of particular relevance to undergraduate students in premedical and predentistry programs, biological anthropology, nutrition, human development, ecology and systematics, sociology, psychology, physiology, and the health-related sciences. It serves to bring together students with a common interest in humankind as defined from these diverse fields and to provide a forum for student-faculty interaction on various topics relating to human evolution and biological diversity. Human Biology is not a major but a curriculum of study that provides majors in various departments with a program for selecting elective courses that deal with the biology of the human species. Students in their junior year may develop a program of study in human biology while majoring in a number of different departmental fields.

Basic Requirements.

The requirements for a program of study in human biology are designed to ensure sufficient background in physical sciences and mathematics to enable the student to pursue a wide range of interests in the fields of modern biological sciences, anthropology, and fields related to the evolution and physical diversity of the human species. Adjustments may be made in these requirements depending upon the student’s academic background and affiliation with colleges and schools within the University.

The basic requirements are one year of introductory biology (Biological Sciences 101-103 plus 102-104 or 105-106 or Biological Sciences 100 offered during the six-week Cornell Summer Session); one year of general chemistry (Chemistry 207-208 or 215-216 or 103-104); one year of college mathematics, including at least one semester of calculus (Mathematics 111-112 or 113-112, or 105-106, or 111-105 or 113-105); at least one semester of organic chemistry lectures (Chemistry 253 or 357-358 or 359-360); one course in genetics (Biological Sciences 281 or 282); one course in biochemistry (Biological Sciences 330 or 331); two semesters of physics (Physics 207-208 or 112-213-214 or 101-102). It is recommended that students planning graduate careers in biological anthropology, paleontology, 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 324 Biopsychology Laboratory (also Biological Sciences 324) Spring. 3 credits.

Psych 425 Brain and Behavior Fall. 3 or 4 credits.

Vet M 331 Medical Parasitology Fall. 2 credits.

Human Behavior

Anthr 221 Human Biology: Variation and Adaptations of Contemporary Populations Fall. 4 credits.

Anthr 476 Human Behavior in Anthropological 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.

HDFS 315 Human Sexuality: A Biocultural Perspective (also Human Service Studies 315) 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 230 Population Problems Spring. 4 credits.

Soc 430 Social Demography Spring. 4 credits.

Human Evolution and Ecology

Anthr 114 Humankind: The Biological Background Fall. 3 credits.

Anthr 221 Human Biology: Variation and Adaptations of Contemporary Populations Fall. 4 credits.

Anthr 375 Ecology and Human Biology Spring. 4 credits.

Anthr 476 Human Behavior in Evolutionary Perspective Fall. 4 credits.

Anthr 877 Seminar in Ecological Anthropology: Food Production and Social Organization Spring. 4 credits.

Bio S 280 Introductory Ecology Fall or spring. 3 credits.

Bio S 301 Biology and Society I: The Biocultural Perspective Fall. 3 or 4 credits.

Bio S 371 Human Paleontology Fall. 4 credits.

Bio S 468 Systems Ecology Spring. 4 credits.

Bio S 477 Organic Evolution Fall. 4 credits.

Bio S 479 Physical Anthropology; History and Theory Fall. 2 credits.

Bio S 481 Population Genetics Spring. 4 credits.

B & Soc 404 Energy and Ecological Systems Fall. 3 credits.

Psych 326 Evolution of Human Behavior Fall. 4 credits.

Soc 230 Population Problems Spring. 3 credits.

Soc 430 Social Demography Spring. 4 credits.

Soc 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, 134 Goldwin Smith Hall, 256-3386

The Independent Major Program is described in the introductory section, pp. 96–97.

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 earned for honors research. Prerequisite: permission of program director. Each participant must submit a brief proposal approved by the honors committee.

International Relations

One of the University's strongest, most diverse fields is international relations. Cornell offers dozons of courses, in many departments and several colleges, that provide a strong education in the field, including courses in 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. Roscrance, director, Center for International Studies, 170 Uris Hall

The purpose of a concentration is to provide a structure for students who have a general interest in the field or who 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

*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, not merely a passing acquaintance with, a modern foreign language. Studying the literature as well as the language of a culture is important. Since, however, students will begin the concentration with varying backgrounds in language and since proficiency is the minimal expectation, no required number of courses is specified.

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, 170 Urs Hall.

Center for International Studies

See Interdisciplinary Centers and Programs, p. 9.

Program of Jewish Studies

D. I. Owen, director and undergraduate adviser (Near Eastern and ancient Jewish history and archaeology), S. Bacharach (industrial and labor relations, sociology, Jewish thought and social theory), M. F. Collins (Bible, Dead Sea Scrolls, apocryphal and rabbinic literature), W. J. Dannhauser (Jews and Germans, contemporary Jewish thought, Gershom Scholem), S. L. Gilman (Yiddish literature, German-Jewish history and literature), G. Korman (Holocaust studies, Jewish labor history), C. Kronfeld (Hebrew language, Hebrew and Yiddish literature), A. S. Lieberman (physical geography and natural history of Israel), D. S. Powers, (History of Jews in Islamic lands), E. Rosenberg (Jews in modern European and Anglo-American literature).

The Program of Jewish Studies is an outgrowth of the Department of Near Eastern Studies. The program has grown out of the conviction that Judaic civilization merits its own comprehensive and thorough treatment and that proper understanding of any culture is inconceivable without adequate knowledge of the language, literature, and history of the people that created it. Accordingly, the offerings in the areas of Hebrew language and literature have been considerably expanded, and courses in ancient, medieval, and modern Jewish history have been added to the program.

Although further expansion of the program is anticipated, it presently enables students to obtain basic instruction and specialization in the fields of Semitic languages, the Hebrew Bible; the Apocryphal and Tannaitic literatures; medieval Hebrew literature; modern Jewish thought, modern Hebrew literature, ancient, medieval, and modern Jewish history; and Yiddish language and literature. In some of these fields students may take courses both on graduate and undergraduate levels. Faculty in other departments provide additional breadth to the program by offering courses in related areas of study.

Courses Offered 1983-84

Elementary Modern Hebrew (Near Eastern Studies 101-102)

Elementary Modern Hebrew (Near Eastern Studies 103) Summer

Elementary Classical Hebrew (Near Eastern Studies 121-122)

Intermediate Modern Hebrew (Near Eastern Studies 201-202)

Masterpieces of Jewish Literature (Near Eastern Studies 205 and Comparative Literature 205)


Ancient Seafaring (Near Eastern Studies 261 and Archaeology 275)

Modern History of the Middle East: Changing Politics, Society, and Ideas (Near Eastern Studies 294 and Government 358)

Advanced Modern Hebrew I and II (Near Eastern Studies 301-302)

Ancient Near Eastern Literature (Near Eastern Studies 332)

Special Topics in Near Eastern Studies (Near Eastern Studies 341-342)

Jews of Arab Lands (Near Eastern Studies 346)

The History and Archaeology of Ebla (Near Eastern Studies 362)

Introduction to Field Archaeology in Israel (Near Eastern Studies 364) Summer.

The History and Archaeology of the Divided Monarchy from the Death of Solomon to the Destruction of Jerusalem, 922-586 B.C.E. (Near Eastern Studies 365)

The History and Archaeology of the Ancient Near East (Near Eastern Studies 366 and Archaeology 310)

Parents and Children in Athens and Jerusalem (Near Eastern Studies 391-392, Society of Humanities 381-382, and History 381-382)

Seminar in Contemporary Near Eastern Society (Near Eastern Studies 396 and Government 352)

The Poetics of Modernism in Literature and Art: Paris, New York, Tel Aviv (Near Eastern Studies 402 and Comparative Literature 402)

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 1983-84

Freshman Seminar in Biblical Literature: Heroes and Heroines of the Bible (Near Eastern Studies 125)

Introduction to the Turkish Language (Near Eastern Studies 131-132)

Elementary Yiddish (Near Eastern Studies 171-172)

Modern Hebrew Literature in Translation: Modern Hebrew Poetry (Near Eastern Studies 207)

Modern Hebrew Literature in Translation: The Modern Hebrew Short Story (Near Eastern Studies 208)

Readings in Classical Hebrew Literature: The Art of Biblical Narrative (Near Eastern Studies 221-222)

Judaic Literature in Late Antiquity (Near Eastern Studies 225)

Aramaic (Near Eastern Studies 238)

The History and Archaeology of Ancient Israel to 450 B.C.E. (Near Eastern Studies 243)

The Emergence of the Modern Jew: 1648-1948 (Near Eastern Studies 245)

Introduction to Biblical Archaeology (Near Eastern Studies 263)

Tradition and the Literary Imagination (Near Eastern Studies 291)

The Hebrew Literary Imagination (Near Eastern Studies 292)

Seminar in Modern Hebrew Literature: The Short Story (Near Eastern Studies 303)

Seminar in Modern Hebrew Literature: The Novel (Near Eastern Studies 304)

Agnon and Hazan (Near Eastern Studies 308)

Undergraduate Seminar in Biblical Literature: Prophecy in Ancient Israel (Near Eastern Studies 322)

Ugaritic (Near Eastern Studies 337)

Biblical Interpretation in Rabbinic Literature (Near Eastern Studies 342)

Age of the Patriarchs (Near Eastern Studies 344)

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 Ancient Egypt (Near Eastern Studies 367)

Yiddish Literature in Translation (German Literature 350 and Near Eastern Studies 373)

The Shetel 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)

Metaphor, Modernism, and Cultural Context: The Use of Metaphor in Modernist Hebrew, Yiddish, English, and American Poetry (Near Eastern Studies 405 and Comparative Literature 405)

Seminar in Syro-Palestinian Archaeology: The Israeli 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. Undergraduates interested in arranging a Latin American concentration or 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
J. Bennett (philosophy), C. Carmichael (comparative literature), C. Greenhouse (anthropology), G. Hay (economics), C. Holmes (history), M. Katzenstein (government), J. Rabkin (government), D. B. Lyons (philosophy), M. B. Norton (history), D. Powers (Near Eastern studies), D. T. Regan (psychology)
The Law and Society Program is 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, and sociology. Students who wish to graduate with a concentration in law and society should consult one of the advisers listed above to develop a coherent program of study, including at least four courses from the law and society list of courses:

[Anthropology 328 Law and Culture]
[Anthropology 329 Politics and Culture]
[Anthropology 627 Legal Anthropology]
Economics 354 Economics of Regulations
Government 300.3 Recent Theories of Justice
Government 313 The Nature, Functions, and Limits of Law
Government 322 Criminal Justice
Government 323 The "Fourth" Branch
Government 328 Constitutional Politics: The United States Supreme Court
Government 353 The Feminist Movement and Public Policy
Government 364 Liberty, Equality, and Social Order
Government 389 International Law
Government 457 Comparative Public Law: Legal Controls on Government in Europe and America

History 275 Crime and Punishment: From the Puritans to Mickey Spillane

[History 359 The Early Development of Anglo-American Common Law]

History 430 Law and Authority in America: Freedom, Restraint, and Judgment

Philosophy 342 Law, Society, and Morality

Philosophy 441 Contemporary Ethical Theory

Philosophy 444 (also Law 720) Contemporary Legal Theory

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 science. 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.

Medieval Studies

Undergraduates interested in medieval studies may have an opportunity to take courses in the following areas of instruction: medieval Hebrew, Arabic, and Latin; Old English, Middle English, and medieval Irish and Welsh; Old Provencal and medieval French; medieval Spanish and Italian; Old Saxon, Old High German, Middle High German, Gothic, Old Norse (Old Icelandic), and Old Russian; comparative literature; medieval art and architecture; medieval literature; Latin paleography, medieval musicology; comparative Slavic linguistics, comparative Romance linguistics, and comparative Germanic linguistics.

Undergraduates who wish to undertake an independent major or a concentration in medieval studies should consult the director of the program, Professor Groos, 77 Goldwin Smith Hall.

Information for prospective graduate students is contained in the Announcement of the Graduate School in a brochure on medieval studies, which can be obtained from the director.

Freshman Seminars

101 The Literary Adventure of the Middle Ages
Fall and spring. 3 credits.

Hours to be arranged. Staff.

The legendary figures and fantastic worlds of medieval literature have entranced 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 of 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 and spring. 3 credits.

Hours to be arranged. Staff.

Students who wish to graduate with a concentration in medieval literature have entranced 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 of 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.

Graduate Seminars

601 Graduate Seminar
Fall. 4 credits.
M 3.55. A. Groos.
Topic: Arthurian romance.

602 Graduate Seminar
Spring. 4 credits.

Hours to be arranged. Staff.

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, 320 Goldwin Smith Hall.

Courses in religious studies currently offered include the following:

Natural Resources 407 Religion, Ethics, and the Environment
Spring. 3 credits.
R. Baer.

Comparative Literature 429 Readings in the New Testament
Fall. 4 credits.
J. Bishop.

Comparative Literature 326 Christianity and Judaism
Spring. 4 credits.
C. Carmichael.

Comparative Literature 328 Literature of the Old Testament
Fall. 4 credits.
C. Carmichael.

Special Programs and Interdisciplinary Studies 211
Students seeking admission to the program should have completed the following prerequisites: (a) Sociology 101, Sociology 201, or Anthropology 201; (b) either Psychology 101 or 280 or Sociology 280; and (c) either Sociology 301 or Industrial and Labor Relations 210 or an equivalent course in statistics.

The Major

The major calls for a minimum of 36 credits of course work as follows:

1) three pairs or other combinations of related courses at the 300 level or above, to be selected in consultation with the major adviser (these six courses must include two courses from each of the following disciplines: anthropology, social psychology, sociology); (2) at least one course in methods, to be selected from the following: anthropological methods, techniques of experimentation (psychology), methods in sociology, advanced psychological statistics, philosophy of science or of social science, or advanced statistics (such as Industrial and Labor Relations 311); (3) at least one course in theory related to social relations; and (4) the senior seminar in social relations (Sociology 497 or Anthropology 495).

A list of the courses that may be used to satisfy the requirements for a major in social relations is available from any of the major advisers.

Society for the Humanities

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. Unlike other courses, the seminars offered by the Society begin the second week of each semester. These seminars are open to graduate students and suitably qualified undergraduates. Students wishing to attend should telephone the Society (256-4725) early in the first week of the term to arrange a short interview with the fellow offering the course. 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.

The Society offers special opportunities for research in the humanities, in its purest form, uncovers "the grandeur of the impossible into the boring. Einstein contends that science, in its purest form, uncovers "the grandeur of 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 his position in a geocentric, divinely ordered universe to that of a genetically programmed organism in a decaying biosystem. We shall examine how well, or how completely, he has accommodated his dreams to the new works born of science.

381-382 Parents and Children in Athens and Jerusalem (also History 381-382) The Frederick G. Marsham Seminar. 381, fall, 382, spring. 4 credits each term. Enrollment limited. Permission of instructor required. Fall: W 2-30-4-30; spring: irregular class meetings. In spring students will pursue independent work in consultation with the instructors, and the class will meet for special events and presentations by class members. C. Kronfield, B. Strauss. The focus is on the images and reality of parent-child relations in ancient Athens and Israel, with masterpieces of these two central Mediterranean cultures serving as main texts. Questions to be examined both from the historian's and from the literary critic's point of view include parenthood in the Homeric epic and in Biblical narrative, generation gap and the tension between emulation and rebellion, gender stereotypes of parent and child images, and the theme of war and child sacrifice. For comparative purposes attention will also be paid to the images of parent-child relations in modern Greece and Israel as well as in the Greek and Jewish Diasporas. Students who wish to read the literature in the original languages will be supplied with appropriate texts.

413 Virgil's Eclogues: Images of Cultural Change Fall. 4 credits. T 3:35-5:20. A. Patterson Virgil's Eclogues offer an unusual opportunity for reception study in that few classical texts have been so frequently edited, annotated, translated, imitated, and visually illustrated. The constant process of reinterpretation so documented is of great interest, not only in itself, but also as it demonstrates the ways in which the ideological stimulus of Virgil's text was a factor in its survival. Authors or translators selected for special treatment will be Petrarach, Boccaccio, Saranzaroz, Spenser, Milton, Ong Oigit, Pope (and Phillips), Wordsworth, Samuel Palmer, and Paul Valéry. The use of visual materials as a basis for discussion will be strongly encouraged.

414 Figurative Arts of Antiquity in the Renaissance Spring. 4 credits. T 3:35-5:20. P. P. Bober. This seminar will address a number of questions concerning the uses of ancient art in the Renaissance, antiquarian concerns, artists' discrimination among varying types and representational modes; as well as programmatic collecting, with special reference to the history of Roman collections visited by Aldrovandi in 1549.

415 The Myth of Orpheus 4 credits. M 3:35-5:20. F. Graf. The study of the key documents, both literary and archaeological, will establish the importance and development of the Orphic myth in literature and religion of ancient Greece, and Rome and introduce the more general problems of interpreting Greek myths. A more rapid survey of documents since antiquity will trace the forms that the myth assumed
when taken over into medieval and Renaissance art, literature, and music. The literary document study will be in Greek and Latin.

416 A Pagan Saint: Philostratus’ Life of Apollonius

Spring. 4 credits.
M 3:35-5:20. F. Graf
Who was the historical Apollonius of Tyana? What were the forces and motivations behind his transformation into a saint? How did his life and works influence the Christian church? What shapes did these transformations take? Through reading (in Greek) and analysis of selected parts of Philostratus’ Vita Apollonii, we will try to answer these questions, which, inevitably, lead us into some more general problems of later Greek and Roman religion.

417 The Aristotelian Tradition in the Early and High Middle Ages

Fall. 4 credits.
W 3:35-5:20. C. Brousseau
A study of the reception, preservation, and utilization of Aristotelian texts and ideas from the Romans through the middle of the thirteenth century. Topics to be examined include the influence of Aristotle upon medieval theologians, the role of Aristotelian thought in the medieval revival of interest in the old Greek and Roman wisdom, and the formation of Aristotelianism as a distinct school of thought in the High Middle Ages. Prerequisite: reading knowledge of Latin or Greek.

421-422 The Rhetoric of Renaissance Humanism

421, fall; 422, spring. 4 credits each term.
Prerequisite for fall: reading knowledge of Latin or Italian.
M 1:25-3:10. V. Kahn
The aims of this course are threefold: to familiarize the student with the major texts of Renaissance humanism, to come to a clearer understanding of the concept of literate reading (the rules that govern it, the historical line of its development) and to raise certain theoretical questions about the historical nature of the act of interpretation. Particular attention will be paid to the humanists’ conception of the activity of reading and of the relationship of rhetoric to poetry. Primary texts will include works by Petrarch, Salutati, Valla, Pico, Machiavelli, Montaigne, Spenser, Jonson, Bacon, Hobbes. The fall semester will focus primarily on the Italian Renaissance, the spring semester on the English Renaissance. Students may register for either semester or both.

423 Thinking One’s Way Back into the Past

Fall. 4 credits.
T 1:25-3:10. F. Althoff
This seminar examines common preconceptions about the nature of the Greek and Roman world and how they shaped our thinking about our past. We will begin with seemingly innocuous popular notions, such as “the cradle of civilization,” which allow us to turn our history into our own ancestry, our ancestors into our children, and to more complex problems, such as the attempts of modern critics to explain “mythic” time in Greek and Roman poetry in terms of Newtonian time. We will, in short, try to discover what perspectives we should leave behind as we begin our journey back in time. Texts to be discussed will include passages from Virgil, The Aeneid, Seneca, Trojan Women, Varro, The Latin Language, Lucian, Select Sapphics, Plutarch, The Face in the Circle of the Moon, Sallustius, On the Gods and the Universe.

424 Narcissus at the Well

Spring. 4 credits.
T 1:25-3:10. F. Althoff
Greek and Roman antiquity has long been both the well and the reflecting pool of subsequent Western art and literature. Successive generations discerned in it, with approval or disapproval, the reflection of their own world, ideas, and art. In recent decades the pool has shrunk. This seminar explores various Greek and Roman works that were once part of the reflecting pool, looking back to Ovid, Metamorphoses, and Statius’ Thebaid, and how they were perceived by those who looked in on them at various times. Topics to be included will be: how Homer was interpreted by poets and critics in the first century A.D.; how Statius was read by his medieval Irish translator and by Dante; why Statius is no longer considered. This seminar is intended for undergraduates but should treat enough unfamiliar material to be of interest to graduate students and faculty too. An additional section would be held, on demand, to discuss features of the Greek and Roman writers that can be seen even after a cursory glance at the original.

425-426 The Carolingian Renaissance

425, fall; 426, spring. 4 credits each term.
W 1:25-3:10. J. John
The seminar will treat selected aspects of Western European history in the eighth and ninth centuries, the period responsible for the preservation and transmission of much of the Latin classical tradition. Attention will be devoted not only to self-conscious revivals of classical ways but also to unconscious or conscious continuities and modifications of those ways. An attempt will be made both to determine what it was within eighth- and ninth-century society, especially within its monastic milieu, that made classical ways appealing, and to preserve the understanding of the interaction of the classical and monastic traditions that had on each other. Subjects to be studied will include the book-making arts (with particular emphasis on scripts and decoration) and libraries in the fall

427-428 The Rhetoric of Justice

427, fall; 428, spring. 4 credits each term.
R 1:25-3:10. J. Koffler
This course explores classical formulations of the nature of law and justice and critically examines their reformulation in medieval and Renaissance thought and justice. We will give special attention to the problems of tyranny and violence, to the theories that condemn or vindicate them, to the related issue of natural law, and to the relations between law and language, rhetoric, and justice. Readings will be drawn from a variety of texts, including Dante and Shakespeare. The first semester will emphasize classical antiquity and the medieval role of the Renaissance and the discovery of the New World and will conclude with Vico. Students may register for either semester or both.

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 exists to encourage and complement curricular and extracurricular activities in South Asian studies. Students may register for either semester or both.

Southeast Asia Program


Southeast Asia studies at Cornell is included within the Department of Asian Studies. Sixteen faculty members teach in the Colleges of Arts and Sciences, and Agriculture and Life Sciences participate in an interdisciplinary program of teaching and research on the history, culture, and societies of the region stretching from Burma through the Philippines. Courses are offered in such fields as agricultural economics, anthropology, and rural sociology. Instruction is also offered in a wide variety of Southeast Asian languages (Burmese, Cambodian, Thai, and Vietnamese).

Intensive instruction is offered in the Full-year Asian Language Concentration (FALCON) in Indonesian at the beginning and intermediate levels. The formal program of study is enriched by a diverse range of extracurricular activities, including an informal weekly lunchtime seminar, the concerts of the Gamelan Ensemble, and public lectures. The John M. Echols
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, systematize, and 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 students at Cornell and members of the Cornell and ithaca communities who have an intellectual interest in women’s studies. Program facilities include a reading room, informal lounge, and seminar room, are open to all interested students and faculty.

Program Offerings

Undergraduate students in the College of Arts and Sciences wishing to major in women’s studies can design their own major through the College Scholar or Independent Major Programs. Any undergraduate student in the University may elect a women’s studies minor. Students interested in either major or minor should obtain further information from the Women’s Studies office, 332 Uris Hall.

The program typically sponsors a bimonthly noncredit seminar and a biweekly seminar to facilitate sharing of knowledge across disciplinary lines. During the academic year the program also sponsors frequent seminars, related courses, or independent study in women’s studies to select an adviser. In collaboration with that adviser, students will design a coherent program in women’s studies to complement their major. Before graduation students will submit to their adviser a final summary on their completed work in women’s studies.

The Concentration

Undergraduate students who wish to graduate with a concentration in women’s studies should consult with the director of undergraduate studies in women’s studies to select an adviser. In collaboration with that adviser, students will design a coherent program in women’s studies to complement their major. Before graduation students will submit to their adviser a final summary on their completed work in women’s studies.

The concentration is open to students in all colleges or schools 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 adviser.

For further information or to meet with the director of undergraduate studies to select an adviser, students should contact the Women’s Studies Office, 332 Uris Hall, 256-6480.

Distribution Requirement

Distribution requirements are satisfied by any two Women’s Studies courses in any of the following categories.

Social Sciences: any two of 238, 244, 277, 321, 353, 422, plus courses that have been taken previously, with the department’s approval.

History: any two of 227, 238, 362, 363, 426, plus courses that have been taken previously, with the department’s approval.

Humanities: any two of 248, 249, 251, 348, 399, 451, 453, 456, 467, 478, 479, 493, plus courses that have been taken previously, with the department’s approval.

Expressive arts: any two of 248, 249, 399, 451, 453, 456, 476, 478, 479, 483, 493, plus past courses, with the department’s approval.

Courses

Keeping in mind that women’s studies is interdisciplinary, it is useful to distinguish six core areas or foci within the program: ideology and culture, institutions and society, history, literature and the arts, psychology and human development, and natural sciences.

The program offers undergraduate and graduate courses in all of the core areas, both independently and in 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

II. General courses (which provide a general introduction to a broad subject area or core focus within women’s studies)

III. Specialized courses and seminars (which have smaller enrollments and focus upon more specialized topics within each of the core areas)

IV. Related courses and seminars (which need not focus exclusively upon women’s studies issues, but include significant consideration of sex differences, feminist criticism, or gender).

I. Freshman Seminars

Women and Social Transitions in the Twentieth Century (also Asian Studies 101) 3 credits. Not offered 1983-84.

Women and Social Transitions in the Twentieth Century (also Asian Studies 101) 3 credits. Not offered 1983-84.

105 Feminine and Masculine Ideals in Japanese Culture (also Asian Studies 105) Fall. 3 credits. W M F 12:20. K. Bazel.

In its long history, Japanese culture has developed a large number of role models—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 culture.

106 Women and Writing (also English 105) Fall and spring. 3 credits.

Hours to be arranged. Fall: M. Hite; spring: M. Jacobus.

What is a woman? How does she confront her personal experience? Does she play a special role in history, in our definition of society, or in our understanding of language and literature? This course will explore the relation between women and writing. We will discuss writings by and about women, debate our attitudes toward feminism, and analyze the relevance of these questions to our own written work. Individual sections will emphasize different aspects of the relation of women and writing. Which section to choose should depend on your own interest in exploring how women appear in private or autobiographical writings, historical contexts, and/or literary works. Further information on special sections is available in the Freshman Seminar Program office and the Women’s Studies Program office. Textual overlap among the sections is kept to a minimum so that students can take more than one Women and Writing seminar during their time at Cornell.

II. General Courses

Introduction to Women’s Studies Fall. 3 credits. M W F 11:15-12:05. C. A. Martin.

Women’s economic, social, and cultural movement over the past fifteen years has challenged our society’s socioeconomic hierarchies and the knowledge(s) that sustain them. In the process, traditional cultural representations of “woman” and material constraints on women have been opened up to critical examination and change. This course introduces students to the critical analyses of Western culture developed in the context of the feminist movement. We will begin by establishing a conceptual framework for interpreting cultural texts and social practices for patterns of sexual difference and power. We will focus on those socioeconomic, sexual, and racial dynamics of our own culture that structure the ideological and material constraints on women of different classes, races, ages, ethnic backgrounds, and sexual preferences. Our studies will include different forms of social organization and control from language, identity formation, and body image to rape, violence against women, and poverty. We will conclude with an introduction to the history of the women’s movement(s) in this country and Europe.

Biological Basis of Sex Differences (also Biological Sciences 214 and Biology and Society 214) Spring. 3 credits. Prerequisite: one year of introductory biology. Lecs, T R 8:35-9:55, and occasional discs to be arranged. J. E. Fortune.

The structural and functional differences between the sexes are examined. Emphasis is placed on mechanisms of mammalian reproduction, and, where possible, special attention is given to studies of humans. Current evidence on the effects of gender on nonreproductive aspects of life (behavior, mental and physical capabilities) is discussed. The course is intended to provide students with a basic knowledge of reproductive endocrinology and with a basis for objective evaluation of sex differences in relation to contemporary life.

Modern American Sex Roles in Historical Perspective (also History 227) Fall. 4 credits. Prerequisite: intended primarily for sophomores; limited to 20 students. Not offered 1983-84.

M. B. Norton.

Language and the Sexes (also Linguistics 244) Spring. 4 credits. Prerequisites: Linguistics 101 or 111, or Psychology 215, or permission of instructor. Not offered 1983-84.

S. McConnell-Ginet.


M. Jacobus.
Sex and Gender in Cross-Cultural Perspective (also Anthropology 321) Fall 4 credits
M W F 2:30. K. S. March
An introduction to the study of sex roles cross-culturally and to anthropological theories of sex and gender. The course examines various aspects of the place of the sexes in social, political, economic, ideological, and biological systems to emphasize the diversity in gender and sex-role definitions around the world.

Women in the American Society, Past and Present (also History 326) Fall 4 credits
T R 9:05. M. B. Norton
A survey of women's experiences in America, from the seventeenth century to the present. Among the topics to be discussed are: women's roles in the changing nature of household work, the women's rights movement, employment of women outside the home, and contemporary feminism.

The Feminist Movement and Public Policy (also Government 353) Fall 4 credits
T R 10:10-11:25. M. Katzenstein
The course examines the goals, strategies, and ideological development of the feminist movement in the United States and the responses 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 respond to, promote, 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.

The Historical Development of Women as Professionals, 1800-1980 (also Sociology 238 and Human Development and Family Studies 258) Fall 3 credits. Students in endowed units must register for Women's Studies or Sociology 238.
T R 2:30-4. J. Brumberg
The historical evolution of the female professions in America (midwifery, nursing, teaching, librarianship, prostitution, homemaker and domestic work) as well as women's struggles to gain access to medicine, law, the clergy, the academy, 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 professionalism and the consequences of professionalism for women, family structure, and American society are also discussed.

Major Nineteenth-Century Women Novelists (also English 247) Fall 4 credits
M W F 1:25. J. Blackall
This course gives particular attention to the biographical and social circumstances surrounding the novels, their critical reception within their own time, and the themes and subject matter that women novelists elected to write about. The reading includes masterworks and certain other works that exerted a major imaginative impact on contemporary readers. Readings for 1983 are Austen, Persuasion; C. Bronte, Jane Eyre, E. Bronte, Wuthering Heights; Gaskell, Mary Barton; Trollope, The Mill on the Floss; Gilman, "The Yellow Wallpaper"; Chopin, The Awakening. In addition, the 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.

Twentieth-Century Women Novelists (also English 251) Spring 4 credits
M W F 1:25. M. Hite
In this course we will be especially concerned with self-conscious experimental novels and with the questions such novels raise about vision or style. Novels we will be reading include Virginia Woolf's The Waves, Gertrude Stein's Three Lives, Djuna Barnes's Nightwood, Doris Lessing's The Golden Notebook, and Margaret Atwood's Surfacing.

The Female Literary Tradition: Wolstonecraft to Woolf (also English 348) Spring 4 credits
M W F 12:20. M. Jacobsus
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 beginning of the twentieth-century modernist experiment by women. Texts will include works by Wolstonecraft, Austen, Mary Shelley, Emily and Charlotte Bronte, Eliot, Barrett Browning, Gaskell, Gilman, Schreiner, and Woolf.

Feminist Theory and the Challenge of Third World Feminisms Spring 4 credits
Hours to be arranged. C. Mohanty
This course is designed to explore the major issues in feminist theory vis-a-vis the recent challenges posed by the women of color (black, Latin, Asian-American, Native American), and women from Third World countries. We shall focus on five issues: the concepts of patriarchy, sexuality, language and representation, labor, reproduction, and unpaid reproduction. Each issue will be analyzed through representative readings and through contextual analysis of the political questions foregrounded by a study of that issue (for example, the birth control movement under the issue of reproduction, and the wages-for-housework debate under the issue of labor). A close analysis of the specific political questions will enable the seminar 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.

L. Abel
Directions in Feminist Theory (also Government 362) Spring 4 credits
Hours to be arranged. C. A. Martin
This course is designed to explore developments in contemporary feminist theory with particular attention to feminist critiques, reinterpretations, and uses of Marxist, psychoanalytic, and (post)structuralist thought. We will be concerned throughout the course both with the ways in which radical feminist questions converge with developments in these fields and the ways in which feminist analyses challenge some of the most basic assumptions embedded in these and other social theories. In particular, we will focus on three approaches of a variety of feminist thinkers to the relations between "patriarchy" and the political, economic, and racial hierarchies that structure various societies, such as Michel Foucault's History of Sexuality, which introduces new conceptions of the relations between sexuality, knowledge, and power, will provide the focus for in-depth discussions.

The Divided Self in Women's Writing (also Comparative Literature 399) Spring 4 credits. Not offered 1983-84.
I. Ezergailis
Special Problems in the Anthropology of Sex and Gender (also Anthropology 422 and Biology and Society 406) Fall 4 credits. Prerequisite: Women's Studies/Anthropology 321 or permission of instructor.
T R 10-11:15. K. S. March
Each year this seminar focuses on a particular area in the anthropology of sex and gender, building on work done in Anthropology/Women's Studies 321. The topic for fall 1983 will be women in international development. The seminar will look at the integration of women into development planning and projects: the confrontation between the feminisms of developing and developed countries, political rights and participation, land reform, credits, agricultural extension services, technological change, small and landless farmers, migration, informal marketing, domestic service, cottage industry, multinational industry, legal reform, education, health, fertility, and infant formulas. Overall, the seminar pivots around the question of how much Western sexual and family norms, as well as preconceptions about the place of men and women in the public sector, lie at the heart of Western models for development intervention.

Victorians and Modernists: Literary Legends from Wilde to Woolf (also English 453) Spring 4 credits.
M 2:30-3:40. plus one hour to be arranged.
S. Blake
What influence do art and life exert on each other? Should art be judged according to moral categories? Should some art be censored? In what ways are art and politics related? What role does art play in our view of art? What role does art play in our view of gender? These questions, which divided the Victorians, were addressed at the trials of Oscar Wilde. The first half of the semester the seminar will read the transcripts of those trials, reports of the event in the periodical press, and the writings of Wilde and his contemporaries. The second half of the course will focus on such writers as Roundtree, Joyce, G. B. Shaw, Ezra Pound, T. S. Eliot, Wyndham Lewis, and Virginia Woolf on issues of art, politics, and gender that were raised, but not resolved, by the later Victorians.

Edith Wharton, Willa Cather, and Eudora Welty (also English 456) Spring 4 credits.
T R 2:30-3:45. J. Blackall
A representative selection of the best fiction of three distinguished American women writers with particular regard for their representation of women in relation to environment, for their achievements as regionalist writers, and for their practice of the craft of fiction. Reading in 1984: Wharton, The House of Mirth, Summer, The Age of Innocence, and selected short stories; Cather, the Song of the Lark, My Antonia, A Lost Lady, and selected short stories; and Welty, A Curtain of Green, The Wide Net, The Golden Apples, and The Robber Bridegroom. Discussion format with three essays.

The Theory and Politics of Liberal Feminism (also Government 468) Spring 4 credits.
W 1:30-3:30. D. Meyers, M. Katzenstein
A topic of the assumption 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 policies, and compare the merits of the critiques from the left and right.
216 Arts and Sciences

476 Women's Poetry (also English 476) Fall. 4 credits. Limited to 25 students. Prerequisite: permission of instructor. T R 10:10. D. Mermin.
A historical survey of the female poetic tradition in Britain and America, including such writers as Bradstreet, Dickinson, Bronte, Barrett Browning, Bishop, Brooks, and Rath.

478 Women and Writing (also English 478) Fall. 4 credits. Not offered 1983-84. M. Jacobus.

479 On Reading Woman Poets (also English 479) Spring. 4 credits. Not offered 1983-84. S. Siegel.

493 French Feminisms (also French 493) Spring 4 credits. MWF 10:10. N. Furman.
This course will examine the political, theoretical and literary concerns of contemporary French feminist writers. Readings will include representative texts by Simone de Beauvoir, Marguerite Duras, Luce Irigaray, Monique Wittig and Helene Cixous. Taught in English.

499 Directed Study Fall or spring. Variable credit. Prerequisite: one course in women's studies and permission of a faculty member of the Women's Studies Executive Board.
Hours to be arranged. Staff.

626 Graduate Seminar in the History of American Women 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.
The course will survey the major works in the field of American women's history and examine them critically. Each student will conduct her or his own research in the field and write a long (25-35 pages) paper.


638 Contemporary German Women Writers (also German Literature 638) Fall. 4 credits. R 3:35-5:35. I. Ergazalis.
A close examination of selected writings, prose and poetry, by some prominent female authors in East and West Germany after World War II. Though the emphasis will be on reading the texts, the conditions for their creation and some antecedents will be surveyed. Among the authors to be considered are Christa Wolf, Ingeborg Bachmann, Gabriele Wohmann, Irma Friedmenger, Krin Struck, and Verena Stefan.

685 Seminar in Sex Differences and Sex Roles (also Psychology 685 and Sociology 685) Fall. 4 credits. Prerequisite: permission of instructor. Not offered 1983-84. S. Bern.

IV. Related Courses and Seminars

305 Psychological Anthropology (also Anthropology 305) Fall. 4 credits. Not offered 1983-84. J. B. Isbell.

329 Race, Gender and Politics (also Government 329) Fall. 4 credits. Open to sophomores and juniors. Limited to 5 students. Not offered 1983-84. 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. T R 2:30-4. J. Brumberg.
An introduction to, and overview of, problems and issues in the historical literature on American families and the family life cycle. Reading and lectures will demonstrate the pattern of American family experience in past time, focusing on class, ethnicity, sex, and region as important variables. Analysis of the private world of the family in past time will deal with changing cultural conceptions of sexuality, sex roles, 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.


463 The Repressed Feminine in the Writings of Marx (also Government 468) Fall. 4 credits. Not offered 1983-84. S. Buck-Mors.

487 Current Topics in Political Philosophy (also Government 487) Fall. 4 credits. Not offered 1983-84. D. Meyers.

671 Readings in Contemporary Social Theory (also Government 670) Spring. 4 credits. Prerequisite: permission of instructor. Not offered 1983-84. S. Siegel.

Related Courses in Other Departments

Time as a Human Resource (Consumer Economics and Housing 411) Fall. 3 credits. R. Heck.

Dress: A Reflection of American Women's Roles (Design and Environmental Analysis 245) Fall. 3 credits. A. Racine.

The Family in Modern Society (Human Development and Family Studies 150) Fall. 3 credits. P. Moen.

The Family in Cross-cultural Perspective (Human Development and Family Studies 354) Spring. 3 credits. E. Kain.

Theories of Adult Interpersonal Relationships (Human Development and Family Studies 356) Fall. 3 credits. H. Feldman.

Families and Social Policy (Human Development and Family Studies 456) Spring. 3 or 4 credits. P. Moen.

Contemporary Family Theory and Research (Human Development and Family Studies 650) Fall. 3 credits. E. Kain.

Women at Work (Industrial and Labor Relations 366) Spring. 4 credits. F. Miller.

Faculty Roster

Abrams, Meyer H., Ph.D., Harvard U. Class of 1916 Professor of English Emeritus, English
Abrahm, 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
Ali, Frederick M., Ph.D., U. of Texas at Austin. Prof., Classics
Abrecht, Andrews 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, Cristina M., Ph.D., U. of Munich (Germany) Emerson Hinchliff Professor of Spanish Literature, Romance Studies
Ascher, Robert, Ph.D., U. of California at Los Angeles. Prof., Anthropology
Ashcroft, Neil W., Ph.D., Cambridge U. (England) Prof., Prof., Physics/LASSP*
Austin, William W., Ph.D., Harvard U. Given Foundation Professor of Musicology, Music
Babby, Leonard H., Ph.D., Harvard U. Prof., Modern Languages and Linguistics
Bachrach, Samuel B., Ph.D., U. of Wisconsin. Assoc. Prof., Industrial and Labor Relations/Sociology
Bard, Barbara, Ph.D., Cornell U. Asst Prof., Chemistry
Baugh, Daniel A., Ph.D., Cambridge U. (England). Prof., Romance Studies
Becker, Victor, M.F.A., Brandeis U. Asst Prof., Theatre Arts
Beckwith, Steven W.W., Ph.D., California Inst. of Technology. Asst Prof., Astronomy/CRSR
Bern, Daryl J., Ph.D., U. of Michigan, Prof. Psychology
Bem, Sandra L., Ph.D., U. of Michigan, Prof., Psychology/Women's Studies
Bennett, John G., Ph.D., U. of Michigan, Asst Prof., Philosophy
Béreaut, Jacques, Doctoral U Univ. of Lille (France). Prof., Romance Studies
Berkeelman, Karl, Ph.D., Cornell U. Prof., Physics/LNS
Bernal, Martin G., Ph.D., Cambridge U., (England), Assoc Prof., Government
Berstein, Israel, Candidate in Physico-Mathematical Sciences, Roumanian Academy. Prof., Mathematics
Bethe, Hans, Ph.D., U. of Munich (Germany). John Wendell Anderson Prof. of Physics Emeritus, Physics
Bishop, Jonathan P., Ph.D., Harvard U. Prof., English
Jacob Gould Schurman Professor of German Literature, German Literature
Blackall, Jean F., Ph.D., Harvard U. Prof., English
Blumir, Stuart M., Ph.D., U. of Pennsylvania. Assoc. Prof., History
Bock, J. Kathryn, Ph.D., U. of Illinois, Asst. Prof., Psychology
Bogel, Fredric V., Ph.D., Yale U. Prof., English
Troxell, Barbara, M.S., Curtis Inst. of Music. Assoc. Prof., Music
Tsang, Sho-Cheih, Ph.D., London School of Economics (England). Prof., Economics
Tunali, Insan, Ph.D., U. of Wisconsin. Asst. Prof., Economics
Uphoff, Norman T., Ph.D., U. of California at Berkeley. Assoc. Prof., Government
Usner, Daniel H., Jr., Ph.D., Duke U. Asst. Prof., History
van Coetsem, Frans, Dr. Phil., U. of Louvain (Belgium). Prof., Modern Languages and Linguistics
Vanek, Jaroslav, Ph.D., Massachusetts Inst. of Technology. Carl Marks Professor of International Studies, Economics
Vernon, Kathleen M., Ph.D., U. of Chicago. Asst. Prof., Romance Studies
Veverka, Joseph F, Ph.D., Harvard U. Prof., Astronomy/CERS
Volman, Thomas P., Ph.D., U. of Chicago. Asst. Prof., Archaeology
Wahlbin, Lars B., Ph.D., U. of Goteborg (Sweden). Prof., Mathematics
Wen, Henry Y., Jr., Ph.D., Massachusetts Inst. of Technology. Prof., Economics
Wasserman, Ira M., Ph.D., Harvard U. Asst. Prof., Astronomy/CERS
Waugh, Linda R., Ph.D., Indiana U. Prof., Modern Languages and Linguistics
Webster, James C., Ph.D., Princeton U. Prof., Music
Weick, Karl E., Ph.D., Ohio State U. Prof., Business and Public Administration/Psychology
Weiss, John H., Ph.D., Harvard U. Asst. Prof., History
West, James E., Ph.D., Louisiana State U. Prof., Mathematics
Widom, Benjamin, Ph.D., Cornell U. Goldwin Smith Professor of Chemistry. 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
Williams, Simon, Ph.D., U. of East Anglia (England). Asst. Prof., Theatre Arts
Wilson, Kenneth G., Ph.D., California Inst. of Technology. James A. Weeks Professor in Physical Sciences. Physics/LNS
Wolczanski, Peter T., Ph.D., California Inst. of Technology. Asst. Prof., Chemistry
Wolf, 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
Wyatt, David K., Ph.D., Cornell U. Prof., History
Yan, Tung-mow, Ph.D., Harvard U. Prof., Physics/LNS
Yano, Makoto, Ph.D., U. of Rochester. Asst. Prof., Economics
Yennie, Donald R., Ph.D., Columbia U. Prof., Physics/LNS
Young, Martie W., Ph.D., Harvard U. Prof., History of Art
Zaslaw, Neal A., Ph.D., Columbia U. Assoc. Prof., Music
Zholkovsky, Alexander K., Cand. Phil., Moscow U. (USSR). Prof., Russian Literature

*Laboratory of Atomic and Solid State Physics.
†Center for Radiophysics and Space Research.
¶National Astronomy and Ionosphere Center.
¶Laboratory of Nuclear Studies.
Announcement of the Graduate School.

The offices, research laboratories, and classrooms of Organization offer additional services and resources of the Biology Systematics; Neurobiology and Behavior; Physiology; within the Graduate School, as described in the Graduate study in the biological sciences is administered by more than a dozen specialized fields within the Graduate School, as described in the Graduate study in the biological sciences is integral to many disciplines and is 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 Graduate study in the biological sciences is integral to many disciplines and is basic requirements in many schools and colleges at Cornell.

Organization

The Division of Biological Sciences is composed of six major sections: Biochemistry, Molecular and Cell Biology, Genetics and Development, Ecology and Systematics, Neurobiology and Behavior, Physiology, Plant Biology, and two smaller units, 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, counseling, and other important information 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 care counseling for students interested in the marine sciences and administers the SEA Semester Program for Cornell students pursuing studies at Woods Hole or aboard the schooner Westward.

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 or 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, 152, 201, 202, 205, 206, 301, 302, or 304, or by certain other non–biological sciences courses specified by the college.

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 or 101–103 plus 102–104. Advanced placement in biology with a score of 4 or 5 (6 or 8 credits, respectively) satisfies the distribution requirement in the biological sciences.

In the College of Human Ecology, the natural sciences distribution requirement is for at least 6 credits selected from Biological Sciences 109–110, 101–103, 102–104, 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.

Note: Biological Sciences 100, offered during the six-week Cornell Summer Session for 7 credits, also satisfies the distribution requirement.

Biological Sciences 101–102–103–104 should be taken as a unit by students of any college. 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 inconsecutive 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 through the division's Office for Academic Affairs, where students submit their applications to the major and obtain biology faculty advisers.


Other Teaching Personnel


During the second semester of the sophomore year, all students intending to major in biological sciences must apply for final acceptance into the major with the associate director for academic affairs in 118 Snydor Hall. Application for final acceptance requires completion of the course sequences in introductory biology, chemistry, and mathematics (see requirements 1–3 below), plus one semester of introductory chemistry lecture and lab and 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 by 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 does not demonstrate capacity of students to perform satisfactorily at a more advanced level.

The requirements for biological sciences majors are as follows:

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 103–104. These students receive a total of 8 introductory biology credits (4 AP credits plus 4 course credits). Freshmen who have not taken the CEEB examination may register for a departmentally administered examination in biology that is given during fall orientation week.

2) General chemistry (one year): Chemistry 207–208,* or 215–216,* or 103–104.

3) College mathematics (one year, including at least one semester of calculus): Mathematics 111–112,* or 113–112,* or 105–106, or 111–105, or 113–105.

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.


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 *Since modern biology has an important physical and quantitative orientation, students are advised to undertake basic science courses that emphasize this approach. Asterisks in the above list indicate the courses that provide this orientation, but all courses listed are acceptable for graduation with a biological sciences major. As an alternative to requirements 8 and 9 above, students may choose to complete the Program in General Biology, outlined below.
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 determined 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.

Concentration Areas and Requirements

As noted in the list of requirements above, students accepted into the biological sciences major must choose a concentration area or the Program in General Biology. The concentration requirements are designed to help students achieve depth in one area of biology while ensuring that the selected advanced courses form a coherent and meaningful unit. Because of the flexibility allowed in satisfying these requirements, students should consult their faculty advisers. The possible concentration areas are listed below.

1) Animal Physiology and Anatomy: Bio S 274, The Vertebrates; Bio S 316, Cellular Physiology; an introductory animal physiology course sequence (Biological Sciences 311 and 319 or 416 and 418), and at least one additional course selected from the following: Bio S 212, Invertebrate Zoology; Bio S 313, Histology: The Biology of the Tissues; Bio S 358, Developmental Animal Physiology; Bio S 385, Developmental Biology; Bio S 389, Embryology; Bio S 414, Vertebrate Morphology; Bio S 458, Mammalian Physiology; An Sc 427, Fundamentals of Endocrinology.

*This course is required of students who matriculate as freshmen in fall 1981 and thereafter or as transfer students in fall 1982 and thereafter.

2) Biochemistry: Chemistry 300 or 215–216, Quantitative Chemistry, must be taken. One of the following organic chemistry laboratory sequences also must be taken: Chemistry 301–302, or 251–252–302, or 301, or 251–252. In addition, students must take a physical chemistry sequence (Chemistry 389–390 or 297–298) and a biochemistry laboratory course (Biological Sciences 638 or 430 or 630). It is recommended that students take the more rigorous organic chemistry and physics sequences (Chemistry 357–358 or 359–360 and Physics 207–208) and a third semester of calculus.

Students interested in biochemistry should complete a year of introductory chemistry other than chemistry prior to the start of their sophomore year. Students are also urged to complete introductory biology in their freshman year.

3) Botany: Courses chosen with the aid of an adviser to meet the goal of exposing each student to plant structure, function, classification, ecology, and evolution. The following list states the minimum requirements. Biological Sciences 241 provides an introduction to plant biology and can be accepted in lower division. Five courses (including a plant physiology laboratory course) fulfill the concentration requirement, as follows: (a) Bio S 242 and 244 or 341 and 349, Plant Physiology; (b) Bio S 343, Anatomy of Vascular Plants; (c) either Bio S 345, Plant Anatomy, or Bio S 347, Cytology; and (d) either Bio S 241, Plant Biology, Bio S 348, Physiology, Bio S 444, Comparative and Developmental Morphology of the Embryophyta; Bio S 446, Plant Evolution and the Fossil Record; Bio S 463 and 465, Plant Ecology; or Pi Pa 309, Introductory Mycology. Students are encouraged to take Bio S 499, Undergraduate Research in Biology. Students may elect to complete the required five courses by taking both courses in group (c) rather than taking any in group (d).

4) Cell Biology: Chemistry 300 or 215–216, Quantitative Chemistry, Bio S 630, Laboratory in Cell Biology (strongly recommended), or Bio S 430, Basic Biochemical Methodologies, and one of the following two options:

Option 1: Bio S 432, Survey of Cell Biology, and 8 additional credits distributed between Groups A and B and approved by the adviser.

Option 2: The two courses from Group A and 6 additional credits from Group B approved by the adviser.

Group A: Bio S 438, Cell Proliferation and Oncogenic Viruses; Bio S 483, Molecular Aspects of Development.

Group B: Bio S 305, Basic Immunology; Lectures; Bio S 307, Basic Immunology, Laboratory; Bio S 313, Histology: The Biology of the Tissues; Bio S 345, Plant Anatomy; Bio S 347, Cytology; Bio S 485, Microbial Genetics, Lectures; Bio S 486, Immunogenetics; An Sc 419, Animal Cytogenetics; Micro 290, General Microbiology Lectures; Micro 291, General Microbiology Laboratory; Micro 484, Cytology of Prokaryotes Lectures, Micro 485, Cytology of Prokaryotes Laboratory. Students interested in cell biology should complete a year of introductory chemistry other than Chemistry 103–104 before the start of their sophomore year. Students are also urged to complete introductory biology in their freshman year.

Students anticipating graduate work in cell biology should consider taking a physical chemistry sequence (Chemistry 389–390 or 297–298).

5) Ecology, Systematics, and Evolution: Bio S 360, General Ecology; Bio S 477, Organic Evolution, a plant or animal physiology course; and at least one 400-level course with accompanying laboratory from within the concentration offerings. In addition to these courses, students in this area must select at least two laboratory courses beyond those required of all biology majors (i.e., introductory biology, genetics, and organic chemistry). These two laboratory courses may include the physiology course or courses counted toward fulfillment of the breadth requirement, or both. It is strongly recommended that students planning graduate study take a course in statistics (Industrial and Labor Relations 210 or 311).

6) Genetics and Development: Nine credits, usually selected from the following courses: Bio S 282, Human Genetics; Bio S 347, Cytology; Bio S 385, Developmental Biology; Bio S 389, Embryology; Bio S 446, Cytogenetics; Bio S 477, Organic Evolution; Bio S 481, Population Genetics; Bio S 483, Molecular Aspects of Development; Bio S 484, Molecular Evolution; Bio S 485 and 487, Medical Genetics; Bio S 486, Immunogenetics; Bio S 499, Undergraduate Research in Biology; Bio S 644, Plant Growth and Development; An Sc 419, Animal Cytogenetics; Pi Br 605, Physiological Genetics of Crop Plants.

7) Neurobiology and Behavior: The two-semester introductory course sequence Neurobiology and Behavior I and II (Biological Sciences 221 and 222) with discussion section (4 credits per term) and 9 additional credits, including a second course from the Neubrobiology and Behavior offerings. Biological Sciences 420, 498, 499, and 720 may not be used as the second course. The remainder of the 9 credits may be in any course (such as physiology, developmental biology, cellular biology, ecology, or vertebrate or invertebrate biology) as approved by the adviser as appropriate preparation for work or advanced study in neurobiology and behavior or in related subjects. 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 or thereafter. 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.

8) Independent Option: Special programs for students interested in biophysics, microbiology (College of Arts and Sciences students only), or nutrition are available under this option. In addition, students who want to undertake a course of study not covered by the seven existing concentration areas, special programs, or the Program in General Biology are meeting 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 may not count two courses for breadth credit if one course is a prerequisite to the other course. Students should consult their faculty advisers when choosing the courses to meet this requirement.


2) Botany: Biological Sciences 241, 242 and 244, 341 and 349, 343, 345, 348, 441; Plant Pathology 309.

3) Cellular and Developmental Biology: Biological Sciences 305, 347, 385, 432, 483; Microbiology 290.

4) Ecology, Systematics, and Evolution: Biological Sciences 260, 360, 364, 471, 472, 475, 476, 477; Entomology 212.

5) Neurobiology and Behavior: Biological Sciences 221, 222.

Note: Biological Sciences 471, 472, 475, and 476 may not be used as breadth courses if Biological Sciences 274 is counted as a breadth course.

Biological Sciences 385, 432, 471, 472, 475, and 476 may not be used as breadth courses by students concentrating in animal physiology and anatomy.

Biological Sciences 347 may not be used as a breadth course by students concentrating in botany.

Biological Sciences 305, 313, 345, 347, 432, 483, and Microbiology 290 may not be used as breadth courses by students concentrating in cell biology.

Biological Sciences 347, 385, 389, 477, and 483 may not be used as breadth courses by students concentrating in genetics and development.

Program in General Biology

As an alternative to the requirements for a concentration area or the Program in General 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 (Biological Sciences 260 or 360).

2) Neurobiology and Behavior I or II (Biological Sciences 221 or 222).
Course Page Course Page
206 224 455 231
212 225 457 231
214 225 458 226
221 234 459 (new) 231
221 (new) 234 461 231
231 227 462 231
241 229 463 231
242 229 464 231
244 234 465 231
246 229 466 231
260 231 467 236
274 225 231 468 231
281 233 469 231
289 232 471 231
301 224 472 231
302 224 473 231
304 225 474 231
305 226 475 231
307 225 476 232
311 226 477 232
313 226 478 232
315 226 479 225
316 226 481 233
317 226 482 236
319 226 483 233
321 227 484 231
324 234 485 233
329 (new) 235 486 233
330 227 487 233
331 227 489 233
341 229 493 (692) 235
342 229 495 (new) 235
343 229 497 225
345 229 498 225
347 230 499 225
348 229 600 225
349 229 602 225
351 226 603 225
353 (new) 226 604 225
360 231 606 225
363 235 608 225
364 235 615 226
365 236 617 225
366 236 617 227
367 236 618 227
368 236 619 227
369 236 620 227
370 236 624 235
371 231 627 235
385 233 630 (434) 228
389 233 631 228
396 232 632 228
396 234 633 228
400 (new) 225 634 228
410 226 635 228
412 226 636 (new) 228
413 236 637 228
414 236 638 228
416 238 639 (new) 228
418 226 640 228
420 234 642 230
421 234 643 230
422 234 644 230
423 (new) 234 645 230
425 234 646 230
427 234 647 230
429 234 648 228, 230
430 236 649 230
432 227 651 230
435 227 652 230
436 227 654 230
438 228 655 230
440 232 657 230
441 236 658 227
442 229 660 232
443 229 661 232
444 229 662 232
445 230 664 232
446 230 665 230
447 226 667 232
452 226 668 232
454 226 669 232

Index of Courses
The middle digits of biological sciences course numbers are used to denote courses in specific areas: 0, general; 1, animal physiology and anatomy; 2 and 9, neurobiology and behavior; 3, biochemistry, molecular and cellular biology; 4, botany; 6 and 7, ecology, systematics, and evolution; 8, genetics and development. The middle digit 5 is used when all other course numbers in a particular area have already been assigned.

Current and Former Course Numbers
Course Course Course
101 224 109 224 444
102 224 110 224 445
103 224 132 227 446
104 224 152 (new) 224 447
105 221 261 224 452
106 224 202 224 452
108 224 205 224 454
201 224 455 231
212 225 457 231
214 225 458 226
221 234 459 (new) 231
221 (new) 234 461 231
231 227 462 231
241 229 463 231
242 229 464 231
244 234 465 231
246 229 466 231
260 231 467 236
274 225 231 468 231
281 233 469 231
289 232 471 231
301 224 472 231
302 224 473 231
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305 226 475 231
307 225 476 232
311 226 477 232
313 226 478 232
315 226 479 225
316 226 481 233
317 226 482 236
319 226 483 233
321 227 484 231
324 234 485 233
329 (new) 235 486 233
330 227 487 233
331 227 489 233
101–102 Biological Sciences, Lectures. 101, fall, 102, spring. 2 credits each term. Prerequisite: concurrent enrollment in Biological Sciences 103 (fall) or 104 (spring). Passing grade (D or better) in 101 is prerequisite to 102 unless written permission is obtained from instructor. S-U grades optional, with permission of instructor. May not be taken for credit after Biological Sciences 105–106 or 109–110. Lect. M W F 9:05 or 10:10. 2 lecture each week to accommodate these, students must reserve all 3 days. Evening prelims: fall, Sept. 29 and Nov. 10; spring, Feb. 23 and Mar. 22. C. D. Hopkins. Designed both for students who intend to specialize in biological sciences and for those specializing in other subjects, such as the social sciences or humanities, who want to obtain a thorough knowledge of biology as part of their general education. Plant and animal materials are considered together rather than in separate units. The fall semester covers the chemical and cellular basis of life, energy transformations, anatomy, physiology, and behavior. The spring semester covers genetics and development, evolution, ecology, the origin of life, and the diversity of living organisms. Each topic is considered in the light of modern evolutionary theory.

103–104 Biological Sciences, Laboratory. 103, fall; 104, spring. 2 credits each term. Prerequisite: concurrent enrollment in Biological Sciences 101 (fall) or 102 (spring), or written permission of instructor. 103 is prerequisite to 104 unless written permission is obtained from instructor. S-U grades optional, with permission of instructor. No admiss after second week of classes.

Lab. M T W or R 1:25–4:25, M W or R 7:30–10:30 p.m., T or R 8–11, or F 10:10–1:10. One 3-hour lab each week a weekday except for discs, special labs, etc. To accommodate weekly lab section, students must reserve M W and F 9:05 or 10:10, since the day of the lab section varies throughout the semester. J. C. Glase, P. R. Ecklund, F. E. Keyel, and staff. A laboratory course emphasizing the methods used by biologists to discover new knowledge. Students design and perform investigations in biology. In preparing and following experiments, exposure is given to basic biological concepts, research methodologies, relevant data analysis techniques and statistics, instrumentation, and laboratory techniques in all of the major areas of biology. 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 (2 credits for transfer students, with permission of instructor). Prerequisite 105 is prerequisite to 106, unless written permission is obtained from instructor. S-U grades optional, with written permission of instructor. May not be taken for credit after Biological Sciences 101–104 or 109–110. No admiss after first week of classes. Fee, $5. Lect. M 12:20–disc, 1 hour each week to be arranged; additional study and lab hours arranged at student's convenience. First lecture of fall term held on first day of classes (Wednesday, August 31). J. G. Gribben, R. L. Luedtke, C. H. McDaniel. Designed primarily for biology majors, preprofessionals, and other students who desire a challenging broad introduction to fundamental concepts of biology. Covers biochemistry and physiology. The spring semester covers genetics, development, ecology, evolution, behavior, and the diversity of organisms. The course uses an integrated 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.

108 Interactive Computing for Students of Biological Sciences. Spring. 1 credit. Not open to students with prior courses in computing. Lect. T 1:25, lec every other week. Staff. An introduction to computing using the interactive language BASIC. Students learn principles of computer language BASIC and learn how to use personal computers and other interactive computing languages such as FORTRAN. Students are issued tickets for 10 hours of computing time at the Division of Biological Sciences interactive computing facility. Students are encouraged to use their knowledge in the biological sciences for which microcomputers may be used are emphasized.

109–110 Biological Principles. 109, fall; 110, spring. 3 credits each term. Limited to 600 students. Prerequisite. 109 is prerequisite to 110 unless written permission is obtained from instructor and the student has at least 3 credits of college biology. S-U grades optional (not recommended). May not be taken for credit after Biological Sciences 101–104 or 105–106. This course may be used to fulfill the distribution requirement in the Colleges of Agriculture and Life Sciences, Arts and Sciences, and Human Ecology but may not be used as an introductory course for the major in biological sciences. Note that this course may not always satisfy the prerequisite for second- and third-year students. Lect. M W F 9:05 or 10:10; lab, M T W R or F 2:45–2:45, M T W R or F 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. 29 and Nov. 10; spring, Feb. 23 and Mar. 22. P. R. Ecklund, C. Eberhard; spring, A. W. Blackler, C. Eberhard. Students who do not plan to major in biology may take this broad introductory course in modern biology. It is not a course in social biology but addresses itself to biological principles with academic rigor. The content is designed 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 for meaningful, self-directing experiments, demonstrations, and discussions.

152 Special Topics in Biology. Spring. 1 credit. Limited to 30 students. Prerequisites. Superior performance in Biological Sciences 105 or equivalent and concurrent enrollment in Biological Sciences 110, or permission of instructor. S-U grades only. This course may not be used as a fulfillment of college distribution requirements. Lect. 1 hour each week to be arranged. E. R. Turgeon, C. Eberhard. A lecture course designed to complement Biological Sciences 109–110 by providing an opportunity for deeper exploration of selected topics of particular interest. Students are asked for suggestions on lecture subjects. Class involvement and discussion are encouraged. The final grade is determined on the basis of three examinations to be taken during lecture hours.


205 Biomedical Ethics (also Philosophy 245). Fall. 3 credits. Primarily for sophomores, juniors, and seniors; permission of instructor required for graduate students. Lect., M W F 1:25. C. Hughes. Critical analysis of the conceptual framework in which ethical problems in biology and medicine are to be understood, debated, and solved. Problems include contraception, genetic engineering, euthanasia and suicide, physician-patient relationships and medical paternalism, and the allocation of scarce medical resources (both micro and macro).

206 Environmental Ethics (also Philosophy 246). Spring. 3 credits. Open to sophomores, juniors, and seniors; permission of instructor required for graduate students. Lect., M W F 1:25. C. Hughes. Critical analysis of the conceptual framework in which environmental policies are formulated and judged. Problems include private interest versus the public good, the relation of individual rights to the collective welfare with respect to property, compensation, and the exercise of eminent domain, and moral obligations to the poor, to future generations, and to the nonhuman environment.

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 part of the two-semester core course for the biology and society major and is also available to other students who have fulfilled the necessary prerequisite. Lect., T R 8:40–9:55. J. Greenwood Human biology, behavior, and culture are viewed as the ongoing products of the interactions between human biological evolution and cultural change. These interactions are documented with reference to the evolution of a biocultural universe, major models of human nature and human institutions.

302 Alternative Food-Production Systems (also Anthropology 302 and Biology and Society 302). Spring. 3 or 4 credits (4 credits by arrangement with instructor). Prerequisite: Biological Sciences 301 or permission of instructor. S-U grades optional. This course fulfills the second-semester core-course requirement for the biology and society major and is also available to other students who have taken 301. Lects., T R 10:10–11:10. 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 energy use in agriculture, crop-breeding programs, soil conservation, chemicals in agriculture, and international food policy are considered. Emphasis is placed on developing alternatives to current practices. Lectures on material assigned readings are followed by discussion sessions.
[304 Chemicals, Enzymes, and Maladies (also Biology and Society 304 and Toxicology 304) Spring. 3 or 4 credits (4 credits by arrangement with instructor). Prerequisites: Biological Sciences 301 and previous or concurrent enrollment in 330 or 331, or permission of instructor: S-U grades optional. This course fulfills the second-semester core-course requirement for the biology and society major and is also available to other students who meet the prerequisites. Not offered 1983–84.

The biochemistry of chemicals as potential health hazards are examined from a multidisciplinary perspective. Scientific, social, public-policy, and ethical issues are analyzed critically. The course integrates biochemical examination of occupational and environmental hazards posed by specific chemicals acting as carcinogens, allergens, mutagens, or teratogens, and chemical diseases. Lectures covering assigned readings are followed by discussion sessions.]

305 Basic Immunology, Lectures (also Veterinary Medicine 315) Fall. 2 credits. Recommended: basic courses in microbial biology, cell biology, and genetics.
Course material covers current concepts in immunology at an elementary level, with special emphasis on the biological functions of the immune response.

307 Basic Immunology, Laboratory (also Veterinary Medicine 316) Fall. 2 credits.
Prerequisite: a course in basic microbiology or permission of instructor. Recommended: concurrent enrollment in Biological Sciences 305.
Designed to illustrate immunological concepts presented in Biological Sciences 305. Laboratory exercises focus on the students with basic humoral and cellular immune phenomena and to offer firsthand experience in immunological laboratory techniques.

400 Undergraduate Seminar in Biology Fall or spring. Variable credit. May be repeated for credit. S-U grades optional.
Sem to be arranged. Staff.
From time to time, different seminars on topics of interest to undergraduates are offered. Topics and instructors are listed in the division’s catalog supplement issued at the beginning of the semester.

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 100 arts college 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 currently offering such experience include Biological Sciences 105–106, 274, 324, 330, 430, 484, 468, and 475.

499 Undergraduate Research in Biology Fall or spring. Variable credit. Students in the College of Arts and Sciences may not register for more than 8 credits per term. 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 supervisors outside the division are acceptable only if a faculty member of the division agrees to take full responsibility for the quality of the work. This course is divided into multiple sections as the courseisters. Students must register under supervisor’s assigned section number, or under section 01 if supervisor was not assigned a section number. Students registering unrequited by the Office for Academic Affairs in Simson 118.

Hours to be arranged. Staff.
Practice in planning, conducting, and reporting independent laboratory and library research programs.

Research credits may not be used in completion of the following concentration areas: animal physiology and anatomy; biochemistry; botany; cell biology; 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 to 1 credit. 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 optional.
Lec. and lab to be arranged. M. V. Parthasarathy, M. K. Campenot.
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 methods of preparing biological material for scanning electron microscopy.

602 Advanced Electron Microscopy for Biologists I Spring, weeks 1–3 to 1 credit. Primarily for graduate students. Limited to 8 students.
Prerequisites: Biological Sciences 603 or equivalent, and permission of instructor: S-U grades optional.
Lec., T 11:15; disc to be arranged; labs, T R 1:25–4:25. M. V. Parthasarathy.
High-resolution electron microscopy; problems of obtaining high-resolution electron micrographs of biological specimens; visualization of macromolecules.

603 Electron Microscopy for Biologists Fall. 3 credits. Primarily for graduate students but open to upperclass students. Limited to 12 students, with preference given to students with research projects requiring electron microscopy. Prerequisites: either Biological Sciences 313, 345, or 347, or equivalent, and written permission of instructor.
Registration during course enrollment recommended. S-U grades only.
Principles of electron microscopy, historical 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 to 1 credit. Primarily for graduate students. Limited to 8 students.
Prerequisites: Biological Sciences 603 or equivalent, and permission of instructor: S-U grades optional.
Lec., T 11:15; disc to be arranged; labs, T R 1:25–4:25. M. V. Parthasarathy.
Principles of electron microscopy at both light microscopy and electron microscopy levels; incorporation of radioactive material into biological specimens for autoradiography; problems of resolution and quantitative aspects of autoradiography.

606 Advanced Electron Microscopy for Biologists III Spring, weeks 7–9 to 1 credit. Primarily for graduate students. Limited to 8 students.
Prerequisites: Biological Sciences 603 or equivalent, and permission of instructor: S-U grades only.

608 Advanced Electron Microscopy for Biologists IV Spring, weeks 10–14 to 1 credit. Primarily for graduate students. Limited to 6 students. Prerequisites: Biological Sciences 603 or equivalent, and either Biological Sciences 602, 604, or 606. S-U grades only.
Hours to be arranged. M. V. Parthasarathy. Project in biological ultrastructure.

702 X-Ray Elemental Analysis in Biology Spring. 1 credit. Limited to 8 students. Prerequisites: Biological Sciences 600 or 603, and permission of instructor: S-U grades only. Offered alternate years. Not offered 1983–84.
Lec. and lab to be arranged. M. V. Parthasarathy, M. K. Campenot.
Principles of X-ray elemental analysis are discussed, with special reference to the energy-dispersive systems. Emphasis is on qualitative elemental analysis of biological specimens and preparation of material for such analysis. A brief introduction to quantitative elemental analysis is also given.

Related Courses in Other Departments

Biology and Society Senior Seminars (Biology and Society 400–402 and 408)
Issues in Biology and Society: Professional Ethics (Biology and Society 311)

Animal Physiology and Anatomy

[212 Invertebrate Zoology Spring. 3 credits Limited to 20 students. Prerequisite: one year of introductory biology for majors. Not offered 1983–84.
Lecs., T R 11:15, lab. T 2–4:25. Staff. An introduction to the structure, function, and development of invertebrate animals of the major phyla, with emphasis on the phylogenetic relationships.]

214 Biological Basis of Sex Differences (also Women’s Studies 214) Spring. 3 credits. Prerequisite: one year of introductory biology, S-U grades optional.
Lecs., T R 1:15–9:55, 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, 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; this course is 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, M W 7–10 p.m., or T R 11:15–5. Evening prelim to be arranged. 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. May be taken for credit after Biological Sciences 416.
Lecs, M W F 11:15. Evening prelims to be arranged. K. A. Houpt and staff.
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.

313 Histology: The Biology of the Tissues Fall. 4 credits
Prerequisite: one year of introductory biology. Background in vertebrate anatomy and organic chemistry or biochemistry. Lecs, T R 11:15. labs, T R 2–4:25. W. A. Wimsatt
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 stressed.

315 Ecological Animal Physiology, Lectures Fall. 3 credits
Prerequisite: one year of introductory biology for majors. Offered alternate years.
Lecs, M W F 1–3 W. F. 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, as well as the interactions of organisms with their environment and the adaptive processes of organisms in their environments. The principles of animal physiology are developed through consideration of the functioning of cells, tissues, and organs. Specific topics discussed include respiration, metabolism, circulation, excretion, body mechanics, muscle contraction, nerve action, osmotic, and central nervous system function. A quantitative, systems-theoretical approach is emphasized.

316 Cellular Physiology Spring. 4 credits
Limited to 50 students, with preference given to students concentrating in animal physiology and anatomy. Each lab section limited to 25 students. Prerequisite: concurrent or previous enrollment in Biological Sciences 330 or 331.
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. Lab work is concerned with cell function and the ultrastructure of cells and terminological techniques used to study cell structure, 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 1983–84; next offered 1985–86.
Lab, W or R 1–25–4. W. N. McFarland and staff. 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 Veterinary Medicine 348) Fall. 2 credits.
Limited to 80 students, with preference given to students concentrating in animal physiology and anatomy. Each lab section limited to 20 students. Prerequisite: concurrent enrollment in Biological Sciences 311, or permission of instructor based on previous attendance in an appropriate introductory physiology course. S-U grades optional. Lab, M T W or R 1–25–5. R. A. Corradino, P. W. Concannon.
A series of student-run experiments exposing the objectives, ethics, techniques, and analysis of procedures in systems physiology conducted in vivo and in vitro with mammals. Reports describing the experiments and requiring extensive outside work are required. Grading is based on evaluation of reports.

351 Biological Rhythms with a Period of One Day to One Year Fall. 1 credit
Prerequisite: one year of introductory biology and either Mathematics 106, 111, or 113. Not offered 1983–84.
Theoretical and practical aspects of circadian and circennal 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 rhythms on migration and reproduction is emphasized.

410 Seminar in Anatomy and Physiology Fall or spring. 1 credit. May be repeated for credit only once. 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 Stimson G25. Staff (coordinator: R. H. Wasserman).

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.
A continuation of Biological Sciences 313. The microscopic and ultrastructural organization of the principal vertebrate organ systems are studied in relation to the functioning of single cells; the role of cells and selected physiological, behavioral, and morphological adaptations of vertebrate and invertebrate animals to their environments are analyzed.

414 Vertebrate Morphology (also Veterinary Medicine 700) Spring. 3 credits
Prerequisites: concurrent enrollment; or Biological Sciences 274 or equivalent. (Prerequisite waived for students concentrating in animal physiology and anatomy.) S-U grades optional. Not offered 1983–84.
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 dissection of the cow. Other species (fish to mammal) of interest to members of the class may also be dissected.

416 General Animal Physiology: A Quantitative Approach, Lectures Spring. 3 credits.
Prerequisites: one year of college biology and physics. S-U grades optional. May not be taken for credit after Biological Sciences 311. Not offered 1983–84.
The principles of animal physiology are developed through consideration of the functioning of cells, tissues, and organs. Specific topics discussed include respiration, metabolism, circulation, excretion, body mechanics, muscle contraction, nerve action, osmotic, and central nervous system function. A quantitative, systems-theoretical approach is emphasized.

418 General Animal Physiology, Laboratory Spring. 2 credits
Prerequisite: concurrent enrollment in Biological Sciences 416 or equivalent.
Lec, W 7:30 p.m.; lab, M or T 12:25–4:25. A. Dobson.
Students are introduced to basic techniques used in the study of the physiology of animal tissues. Experiments deal with respiration, properties of muscles, circulation, activity of nerves, and osmotic phenomena.

450 Mammalian Neurophysiology (also Veterinary Medicine 753) Spring. 3 credits
Prerequisite: two years of college biology. Recommended: courses in biochemistry and physics.
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 examined through classical and modern laboratory studies. Sensory, central, integrative, and motor functions are explored primarily by electrophysiologically recording spontaneous and evoked unit and field potentials. Behavioral, pharmacological, and histological methods are used where appropriate.

452 Comparative Physiology of Reproduction of Vertebrates, Lectures (also Animal Science 452) Spring. 3 credits
Prerequisite: Animal Science 427 or permission of instructor. Not offered 1983–84.
Lecs, M W F 1:25. A. van Tienhoven.
Theory focuses on mechanisms and neuroendocrinology studied in the laboratory. Topics are selected from the following: physiology of membranes and epithelia; nerve and muscle; heart and circulation; endocrine, somatic, and sensory nervous systems; respiration; digestion; salt and water balance; acid-base balance; and endocrine regulation.

458 Mammalian Physiology Spring. 6 credits.
Enrollment limited. Graduate student auditors allowed in lectures. Prerequisite: Biological Sciences 311 or 416, or equivalent with written permission of instructor.
Lecs, M W F 8; lab, M or W 1:25–4:25; 4 additional hours to be arranged. K. W. Beyerbach and staff.
Selected topics in mammalian physiology are discussed, mainly those of the neuroendocrinology studied in the laboratory. Topics are selected from the following: physiology of membranes and epithelia; nerve and muscle; heart and circulation; endocrine, somatic, and sensory nervous systems; respiration; digestion; salt and water balance; acid-base balance; and endocrine regulation.

615 Nutrition and Physiology of Mineral Elements (also Veterinary Medicine 759 and Nutritional Sciences 659) Fall. 2 credits.
Prerequisites: courses in basic physiology, intermediate biochemistry, and general nutrition. Offered alternate years. Not offered 1983–84.
Lectures on nutritional aspects and physiological, biochemical, and hormonal relationships of the prominent macromolecules and microelements, with emphasis on recent developments. Information is included on methodologies of mineral research and the essentiality, requirements, transport, function, homeostasis, interrelationships, and toxicity of various mineral elements.

616 Radioisotopes in Biological Research (also Veterinary Medicine 750) Fall. 4 credits.
Prerequisites: courses in animal or plant physiology, or permission of instructor.
Lectures and laboratory deals with the radioisotope as a tool in biological research. Among the topics considered are the use and detection of beta-emitting isotopes, gamma spectrometry, Cerenkov counting, neutron activation, autoradiography, and isotope dilution. Emphasis is placed on liquid scintillation counting, double-label experiments, and other special procedures. Experiments are designed to present basic principles, using plants and animals as subject material.
617 Applied Electrophysiology (also Veterinary Medicine 652) Fall. 2 credits. Open to seniors, graduate students, and second-, third-, and fourth-year veterinary students. Prerequisites: physics and two years of college biology, or permission of instructor. Lect, W. B. lab, R 2–4:25. E. L. Gasteiger, E. R. Loew.

Theory and practice of electrophysiological techniques currently used for study of the nervous and muscular systems in normal and diseased states. Topics include electroencephalography, electromyography, electroretinography, and evoked potentials.

618 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 cellular physiology and elementary physical chemistry. S-U grades optional, with permission of instructor. Offered alternate years. Lect, T R 11:15. R. H. Wasserman.

An introduction to elementary biophysical properties of biological membranes, theoretical aspects of permeability and 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. Lects, 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 structure, secretion, and catabolism; mechanism of hormonal regulation of lipolysis and fatty acid synthesis, and cholesterol metabolism and atherosclerosis.

658 Molecular Mechanisms of Hormone Action (also Veterinary Medicine 756) Spring. 2 credits. Prerequisite: permission of instructor. Offered alternate years.


An advanced course developed from the current literature on endocrine mechanisms.

712–718 (711–719) Special Topics in Physiology Fall or spring. 1 or 2 credits for each topic. May be repeated for credit. Each topic limited to 20 students, with preference given to graduate students in physiology. S-U grades optional, with permission of instructor.

Discussions and seminars on specialized topics.

Fall 1983: three topics are offered.

713 Farm Animal Behavior (also Biological Sciences 410) 1 credit.

Sem, 1 hour each week to be arranged. K. A. Houp.

715 Evolution of Color Vision 1 credit.

Sem, 1 hour each week to be arranged. E. R. Loew.

717 Fish as a Subject of Physiologic Inquiry 1 credit.

Disc, 1:19 hours each week for 6 weeks to be arranged. W. N. McFarland.

Spring 1984: four topics are offered.

712 History of Physiology: The Digestive Tract 1 credit.

Sem, 1 hour each week to be arranged. T. R. Houpt.

714 Plasma Lipoproteins 1 credit.

Sem, 1 hour each week to be arranged. A. Bensadoun.

716 Dependability of the Nervous System 1 credit.

Sem, 1 hour each week to be arranged. E. L. Gasteiger.

718 Nutritional Pathophysiology 1 credit.

Sem, 1 hour each week to be arranged. F. A. Kafkai.

719 Graduate Research in Animal Physiology (also Veterinary Medicine 600) Fall or spring. Variable credit. Prerequisites: written permission of supervisor and instructor member who supervises the work and assigns the grades. 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.

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 332)

Integration and Coordination of Energy Metabolism (Biological Sciences 637)

Neuroanatomy (Veterinary Medicine 504)

Parasitic Helminthology (Veterinary Medicine 440)

Population Biology of Health and Disease (Veterinary Medicine 330)

Teaching Experience (Biological Sciences 458)

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, S 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 208 or equivalent. S-U grades optional.


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.

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 200 students each semester. Lectures given fall semester only.

330 Principles of Biochemistry, Individualized Instruction Fall or spring. 4 credits. Prerequisite: Chemistry 253 or 358 or equivalent. May not be taken for credit after Biological Sciences 231 unless written permission is obtained from instructor. May not be taken for credit after Biological Sciences 331.

Discs, M W F 8 or 10:10; additional hours to be arranged. No formal labs. Evening preim to be arranged. Fall: M. Ferger, R. E. MacDonald, and R. Barker. Spring: M. Ferger, R. Wu, and staff.

The focal point for this course is a study center, open mornings, afternoons, and some evenings, where students find materials, get help, participate in discussions, and take exams. Students are required to master a minimum body of core material. The pace at which this material is assimilated is largely self-determined. Students who want to go beyond core material have available a wide range of electives, including discussions of research papers and independent study of selected problems and monographs. Grades are determined primarily by the amount of elective work satisfactorily completed and by a final exam.

331 Principles of Biochemistry, Lectures Fall, or 6-week summer session. 4 credits. Prerequisite: Chemistry 253 or 358 or equivalent. May not be taken for credit after Biological Sciences 231 unless written permission is obtained from instructor. May not be taken for credit after Biological Sciences 331.


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, a laboratory course in organic chemistry, and permission of instructor. May not be taken for credit after Biological Sciences 638.


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. Various assay methods, column chromatography, and electrophoresis are taught in an enzymology module. Methods used in the clinical laboratory are used to analyze the student's own blood and urine samples, and some nutritional analyses are done for lipid and vitamin content of foods. For one three-week period there is an option of choosing a cell component or nucleic acid module.

Students attending the M W section isolate and study the various organelles of rat liver cells, while students in the T R section isolate and characterize calf thymus DNA and look at some transfer RNA properties.

432 Survey of Cell Biology Spring, or 3-week summer session. 3 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent.

Lecs, M W F 11:15. J. T. Lis, M. V. Hinkle, and staff.

A survey of material covered in depth in Biological Sciences 438 and 438. The course covers a wide array of topics, including microscopic techniques, membrane activities, cell junctions, organelles, cell movement, cell division, chromosome structure and the control of gene expression, and cellular differentiation.

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: J. K. Moffat.
Selected papers from the literature on a given topic are evaluated critically during or within two-hour meetings. Fall: transposable elements in procaryotes and eucaryotes. spring: protein engineering—the impact of crystallography on biotechnology.

438 Cell Proliferation and Oncogenic Viruses (also Toxicology 638) Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331. Recommended: Biological Sciences 281. Lect., T 12:20, V. M. Vogt. A description of the growth properties of animal cells in culture, followed by discussions of the changes in cells that are induced by tumor viruses and carcinogens. Topics include macromolecular growth factors, contact inhibition, cell surface properties, cell cytoskeleton, transcription and translation of viral and host genomes, and integration of viral DNA into host chromosomes.

630 (434) Laboratory In Cell Biology Spring 4 credits. Enrollment limited. Prerequisites: a course in biochemistry or cell biology, and permission of instructor. May be taken after Biological Sciences 430 or 638 by students desiring a second semester of laboratory experience.
Labs, M W T 1:25-4:25 or R 9:05-4:25. disc to be arranged: J. Giabono and staff.
The course stresses techniques for handling and experimenting with cells of different kinds and provides experience in experimental design.

631 Protein Structure and Function Fall 2 or 3 credits (3 credits with discussion).
Prerequisites: introductory biochemistry, physical chemistry, and organic chemistry, or permission of instructor. S-U grades optional, with permission of instructor.
Lecs., M W T 9:05; disc., F 9:05. G. P. Hess and staff. 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.
Lecs., T R 11:15. P. C. Hinkle. Structure of biological membranes, model membrane systems, ion transport enzymes, oxidative phosphorylation. Together with Biological Sciences 636 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.

634 Biochemistry of the Vitamins and Coenzymes (also Nutritional Sciences 634) Spring. 2 credits. Prerequisites: Biological Sciences 330 or 331 or equivalent, and either Chemistry 356 or 360, or written permission of instructor. Recommended: physical chemistry.
Lecs., T R 10:10 M. N. Kazarian. The chemical, biochemical, and nutritional aspects of the vitamins and coenzymes.

635 Metabolic Regulation (also Nutritional Sciences 635) Spring. 2 credits. Prerequisites: Biological Sciences 330 or 331, and either Chemistry 356 or 360, or written permission of instructor. Recommended: physical chemistry.

636 Molecular Biology of the Cell: Outside the Nucleus Spring. 2 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent.
Lecs., T R 10:10 A. P. Bretscher. Methods in cell biology—moleculaire systems in eucaryotes and procaryotes, the cytoskeleton, cell cycle and mitosis, internal membranes and secretion, endocytosis and exocytosis, cell adhesion and the extracellular matrix, cell interactions, cell junctions, and chemical signaling between cells. 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. Not offered 1983-84.
The elements and dynamics of energy metabolism in higher animals are developed systematically through biochemical characterization of the metabolic components and structure of major tissues and organs. Enzymes are 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 undergraduates majoring in biochemistry and for graduate students minoring in biochemistry. Prerequisites: Biological Sciences 330 or 331, and permission of instructor. Undergraduates must obtain permission of instructor by the last day of the course enrollment period. Graduate students should obtain permission during pre-course enrollment for the spring semester. May not be taken for credit after Biological Sciences 430.
Lab, T or R 9:05-4:25. A lab section is also scheduled W 9:05-4:25 if enrollment requires it. E. B. Keiler, L. A. Heppel, and staff. Selected experiments on proteins, enzymes, DNA, and bioenergetics to illustrate basic biochemical principles. The course emphasizes quantitative 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. Not offered 1983-84. first offered spring 1985.
Lecs., T R 12:20 (6 lees), Nov. 3-22. J. T. Lis. Lectures concerning such topics as chromatin structure, nonhistone chromosomal proteins, the use of recombinant DNA methods to explore the organization of genes, regulation of gene expression, RNA processing, the role of the nuclea matrix in DNA replication and gene expression, the polytene nucleus as a model for defining the architecture of the interphase nucleus, and the nucleus in response to developmental signals. 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 1983-84.
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 cell-wall composition and properties. Attention is paid to operation of control mechanisms.

731-737 (731-737) Current Topics in Biochemistry Fall or spring. 1/2 or 1 credit for each topic. May be repeated for credit. (Students registering for 1/2 credit should not fill in the credit-hour column on the orplcal-mark registration form; the computer is programmed to register students automatically for 1/2 credit.) Prerequisite: Biological Sciences 330 or 331 or equivalent. S-U grades only.
Lectures and seminars on specialized topics. Fall 1983: three topics are offered.

731 Proton-ATPases In Plants 1/2 credit.
T R 12:20 (6 lecs), Sept. 6-22. R. E. McCarty.

733 Topics In Eukaryotic Gene Expression 1/2 credit.

735 Chromatin 1/2 credit.
T R 12:20 (6 lecs), Nov. 3-22. J. T. Lis.
Spring 1984: three topics are offered.

736 Communication between Nerve Cells 1/2 credit.

751 Dilemmas In Toxicology (also Toxicology 671) Fall. 2 credits. Prerequisites: advanced graduate standing and permission of instructor. S-U grades optional.
Sem, 2 hours each week to be arranged. Organizational meeting first F of semester at 12:20. J. M. Fessenden-Raden.
Discussions of controversies of dilemmas faced by practicing scientists in chemical and biochemical fields in academia, industry, and government. Readings of scientific, ethical, and general papers provide background for discussions. Topics for consideration include laboratory safety, testing in animals, conflicts of interest/commitment, data presentation, secrecy in science, impact of regulations on science, and professional codes of ethics.

752 Isotope Kinetics (also Nutritional Sciences 682) Spring. 2 credits. Prerequisite: one year of calculus. Lecs., M W 8-9:55 p.m. D. B. Zilversmit. Quantitative analysis of the transport and distribution of nutrients, metabolites, and drugs in multicompartmental 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: P. C. Hinkle).
Research in the laboratories of two or three different professors chosen by the student. Arrangements are made jointly between the 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, graduate students (first-year students excepted) majoring in biochemistry. S-U grades only.

Sem. M 5–6:30 p.m. V. M. Vogt, J. K. Moffat, P. C. Hinkle

Related Courses in Other Departments

Lipids (Biological Sciences 619)

Molecular Aspects of Development (Biological Sciences 483)

Molecular Mechanisms of Hormone Action (Biological Sciences 658)

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 agriculture, botany, environmental education, forestry, horticulture, natural resources, plant sciences, soil science, zoology, and wildlife. Prerequisite: one year of introductory biology for majors or equivalent. Lecs. TR 9:05; lab. TIME: F 1:25–4:25, or M or W 7:30–10:30 p.m. Lab practical hours to be arranged (Oct. 19–21). K. J. Niklas. 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 Botanical Sciences 244 or written permission of instructor required for undergraduates. May not be taken for credit after Biological Sciences 341 unless written permission is obtained from instructor. Lecs. TR 9:05; lab. M W R or F 1:25–4:25, or M or W 7:30–10:30 p.m. Lab practical hours to be arranged (Oct. 19–21). K. J. Niklas. 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.

244 Plant Physiology, Laboratory Spring. 2 credits. Prerequisite: concurrent enrollment in Biological Sciences 242. May not be taken for credit after Biological Sciences 349. Lab. M T W or R 1:25–4:25; disc. M T W or R 12:20. Lab and disc must be on same day. 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. 3 credits. Limited to 20 students. Prerequisite: written permission of instructor. Not offered 1983-84. Lecs. TR 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 affects his folklore and has influenced his cultural development. Laboratories provide a practical introduction to the plant kingdom by stressing 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 242 unless written permission is obtained from instructor. Lecs. TR 10:10 and M 7:30 p.m. A. T. Jagendorf, A. C. Leopold. The behavior, growth, transport processes, and environmental response of plants. Topics include membrane properties, soil 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. Lecs. M W 10:10; labs. M W 2–4:25, J. W. Ingram. A study of a number of vegetable species, their relationships, and their classification into families and genera. Emphasis cultivated cultivated plants. Particular emphasis is placed on gaining proficiency in identifying and 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.

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. TR 9:05; labs. M W or T R 2–4:25, M. D. Whalen. 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 or a semester of botany. Lecs. M W 9:05; labs. M W 2–4:25 or T R 10:10–12:35. C. H. Uhl. A descriptive course with equal emphasis on development and mature structure. Lectures, 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. Lecs. M W 9:05; labs. M W or T R 10:10–12:35, C. H. Uhl. A study primarily of the structure of cells and their components and the relation of these to function and heredity. Special attention is given to chromosomes. Both plant and animal materials are used.

[348 Phycology Fall. 4 credits. Not offered 1983–84. Lecs. M W F 10:10; lab. M W or F 2–4:25. Staff. An introduction to freshwater and marine algae, including consideration of their ecology as members of the plankton and benthos and their importance to man. The laboratory uses field material and cultures from an extensive living collection to illustrate lecture topics, provides familiarity with algae in the field, and introduces the student to techniques used in isolating, cultivating, and studying algae in the laboratory.]

349 Plant Physiology, Laboratory Fall. 2 credits. Prerequisite: concurrent enrollment in Biological Sciences 341. May not be taken for credit after Biological Sciences 244. Lab. W or R 1–2–4:25, disc. W or R 12:20. Lab and disc must be on same day. C. Reiss. Experiments exemplify concepts covered in Biological Sciences 341 and offer experience in a variety of biological and biochemical techniques, including use of small amounts of radioisotopes.

353 Evolution of Photosynthetic Apparatus: Algae to Higher Plants Fall. 3 credits. Prerequisite: one year of introductory biology. S-U grades optional. Offered Fall 1983 only.

Lecs. TR 10:10–11:30, E. Gant. The structural and functional development of the photosynthetic apparatus, from photosynthetic prokaryotic cells to higher plants. Algal structure is emphasized, since the greatest diversity in thylakoid structure and accessory pigment variety exists in the various algal groups.

[440 Plant Geography Spring. 2 credits. Prerequisite: Biological Sciences 343 or equivalent. Recommended: Biological Sciences 463 or 477 or both. S-U grades optional, with permission of instructor. Offered alternate years. Not offered 1983–84. Lecs. TR 10:10–11:30, D. A. Young. Patterns of distribution and variation of plant species and higher taxa; endemism and disjunction and their causes; influences of past continental movements and climatic change on plant distributions; geographical aspects of plant specialization; major biomes and floristic regions of the world, and methods of phytogeographic analysis.]

442 Biology of Plant Species Spring. 2 credits. Prerequisite: Biological Sciences 343 or equivalent. Recommended: Biological Sciences 463 and 477. S-U grades optional, with permission of instructor. Offered alternate years. Lecs. TR 10:10–11:30, M. D. Whalen. A comprehensive introduction to the nature and origin of plant species, with coverage of plant evolutionary genetics, race formation and modes of speciation, evolution of reproductive isolating mechanisms, types of species complexes found in plants, cytogenetic aspects of plant specialization, natural hybridization and its consequences, and the origin and nature of higher taxa.

[443 Research Methods in Systematic Botany Fall. 2 credits. Limited to 10 students. Prerequisite: Biological Sciences 343 or equivalent. Offered alternate years. Not offered 1983–84. Lab. F 1–2:25–4:25, additional hours to be arranged. Bailey Hortorum staff. An introduction to the methodology of plant systematic research: field techniques, sampling and collecting methods, preparation of taxonomic revisions and monographs, numerical methods of data analysis, and laboratory methods in cytogenetics, comparative morphology, and computerized research, as applied to problems in plant systematics.]

444 Comparative and Developmental Morphology of the Embryophyta Spring. 4 credits. Prerequisite: Biological Sciences 345. Offered alternate years. Lecs. TR 9–11. labs. TR 2–4:25, D. J. Paolillo.
The life histories of bryophytes, vascular cryptogams, and seed plants are examined for their developmental attributes and for 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, 111, or 113, and either Physics 102 or 208, or permission of instructor. Offered alternate years. Not offered 1983–84. Lecs, M 1:25 and T R 10:10. R. K. Clayton. A detailed study of the process by which plants use light in order to grow, physical and physicochemical aspects of the problem are emphasized.

[446] Cytogenetics Spring. 3 credits. Prerequisites: Biological Sciences 261 and 347, or their equivalents. Offered alternate years. Not offered 1983–84. Lecs, M W 9:05; lab, M or W 10:10–12:35. C. H. Uhl. Deals mainly with the cellular mechanisms of heredity, including recent research in cytology, cytogenetics, and cytotomy.

[448] Plant Evolution and the Fossil Record Spring. 3 credits. Prerequisite: Biological Sciences 241 or equivalent, or written permission of instructor. Offered alternate years. Lecs, T R 9:05; lab, R 12:20–2:15. K. J. Niklas. An introduction to evolution, surveying major changes in plants from cell to plant to the present. Emphasis is placed on plant form and function, adaptations to particular ecological settings, and evolutionary theory as it relates to plants.

[640] Applied Plant Anatomy Spring. 3 credits. Prerequisites: Biological Sciences 345 or equivalent, and permission of instructor. Lecs and disc, T R 9:05; lab, W 10:10–11:10 or by arrangement with instructor. N. W. Uhl. The use of anatomy in vascular plants for diagnosis of structure, taxonomic relationships, evolutionary sequences, and ecological adaptations, with emphasis on recent research. The laboratory provides experience in techniques and interpretation.

[642] Topics in Ultrastructure of Plant Cells Spring. 3 credits. Primarily for graduate students, although upperclass students with adequate background are allowed to enroll. No auditors. Prerequisites: Biological Sciences 345 or 347, and written permission of course coordinator. Offered alternate years. Lecs, M W F 10:10; optional disc, F 1:25 or to be arranged. Staff (coordinator: M. V. Parthasarathy). An advanced course dealing with organelles in depth, and in breadth where necessary. Topics include salient ultrastructural features of some plant groups and certain specialized cells and processes. Content of the course and staff direction vary to some extent from year to year.


[644] Plant Growth and Development Spring. 3 credits. Prerequisites: Biological Sciences 345 and either 242 or 341, or their equivalents, or written permission of instructor. Offered alternate years. Lecs, M W F 9:05, A. C. Leopold, D. J. Paolillo. Explores the changes that occur during plant growth and development and their control: morphological and anatomical changes in apices, tissue differentiation, organ formation, embryo development, gene regulation, hormone action and interaction, the influence of light in development, flowering, fruiting, dormancy, abscission, and senescence.

[645] Families of Tropical Flowering Plants Fall 1 credit. Prerequisite: written permission of instructor. S-U grades only. Offered alternate years. Lecs and disc to be arranged. J. D. Young. The families of flowering plants encountered solely or chiefly in tropical regions are considered in lectures, discussions, and demonstrations, with the aim of providing basic points of recognition for, and an understanding of, distribution and relationships in these families for the student venturing into the tropics.

[646] Families of Tropical Flowering Plants: Field Laboratory Intersession. 3 credits. Limited to 20 students, with preference given to seniors and graduate students from member institutions of the Organization for Tropical Studies. Prerequisite: Biological Sciences 342 or 343 or equivalent. Recommended: Biological Sciences 645. S-U grades only. For more details and application, contact the L. H. Bailey Hortorium, 467 Mann Library. Offered alternate years. Not offered 1983–84. Bailey Hortorium staff.

[647] Seminar in Systematic Botany Spring. 1 credit. May be repeated for credit. Prerequisite: written permission of course coordinator required for undergraduates. S-U grades optional. Staff to be arranged. Organizational meeting first F of semester at 1:25. Staff (coordinator: D. A. Young). Lectures and discussions led by staff, visitors, and students on topics of current importance to systematic botany.

[648] Plant Biochemistry Spring. 3 credits. Prerequisites: organic chemistry, biochemistry, and a course in plant physiology. Offered alternate years. Not offered 1983–84. Lecs, M W F 9:05, A. T. Jagendorf, R. E. McCarty, J. F. Thompson. Selected areas of plant biochemistry are reviewed in the context of the plant life cycle and responses to the environment. Topics include metabolism of lipids, carbohydrates, organic acids, and proteins; nitrogen and sulfur assimilation; respiration; photosynthesis, development and mineral nutrition; cell-wall composition and properties. Attention is paid to operation of control mechanisms.

[649] Transport of Solutes and Water in Plants Fall. 3 credits. Prerequisite: Biological Sciences 341 or equivalent. Offered alternate years. Lecs, M W F 10:10. R. M. Sparwsk. 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 1983–84. Lecs, T R 10:10–11:30. R. M. Sparwsk. 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 1983–84. Lecs and disc to be arranged. W. J. Drew. Basic grammar and vocabulary and exercises in writing and reading the Latin of plant taxonomy, as well as applications to botanical nomenclature.


[656] Topics in Paleobotany Spring. 1 credit. Prerequisite: Biological Sciences 448 or equivalent background in evolution, or written permission of instructor. Lab and disc to be arranged. K. J. Niklas. A series of selected topics designed 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 seed plants, and the origin and adaptive radiation of the angiosperms.

[657] Literature of Taxonomic Botany Fall. 1 credit. Prerequisite: written permission of instructor. S-U grades optional. Offered alternate years. Lecs and disc, R 10:10. J. W. Ingram. A survey of the basic reference works in taxonomy from the pre-Linnaean literature drawn on by Linnaeus to contemporary publications, with comments on the peculiarities of the books (when appropriate), publication dates, typographic devices, and intricacies of bibliographic citation.

[740] Plant Biology Seminar Fall and spring. No credit (no official registration). Required of graduate students doing work in plant physiology. 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 an individual basis.

[840] Current Topics in Plant Physiology Fall or spring. 2 credits. May be repeated for credit. S-U grades only. Sem to be arranged. Staff. Seminar reports by graduate students on current literature in experimental plant physiology or related areas.

Related Courses in Other Departments

Mycology (Plant Pathology 709)

Mycology Conferences (Plant Pathology 710)

Field Physiology (Biological Sciences 441)

Introductory Mycology (Plant Pathology 309)

Plant Ecology, Lectures and Laboratory (Biological Sciences 453 and 455)

Plant Ecology Seminar (Biological Sciences 669)

Taxonomy of Fungi (Plant Pathology 729)

Teaching Experience (Biological Sciences 498)

Undergraduate Research in Biology (Biological Sciences 499)
260 Introductory Ecology Fall. 3 credits. Prerequisite: one year of introductory biology or written permission of instructor. May not be taken for credit after Biological Sciences 360. Lecs, T R 11:15, disc, T or R 1:25, 2:30, or 3:35, C. A. S. Hall and 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.

274 The Vertebrates Spring. 5 credits. Primarily for sophomores; this course is a prerequisite of 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, M W 7 - 10 p.m., or T R 1:25 - 5. Evening prelim to be arranged. Staff.

360 General Ecology Fall or spring. 3 credits. For students concentrating in ecology or a related subject. Not open to freshmen in fall semester. Prerequisite: one year of introductory biology for majors. May not be taken for credit after Biological Sciences 260.

360 General Ecology Fall or spring. 3 credits. For students concentrating in ecology or a related subject. Not open to freshmen in fall semester. Prerequisite: one year of introductory biology for majors. May not be taken for credit after Biological Sciences 260.

457 Insect Ecology, Laboratory (also Entomology 457) Fall. 2 credits. Limited to 16 students. Prerequisite: concurrent enrollment in Biological Sciences 456. Offered alternate years.

468 Systems Ecology Fall. 4 credits. Prerequisite: Biological Sciences 260 or 360 or equivalent. Recommended: Computer Science 102 and calculus. S-U grades optional. Offered alternate years. Lecs, M W F 10:10; disc, T or R 2:30 - 4:05. Labor field trip required at beginning of course. C. A. S. Hall.

469 Agriculture, Society, and the Environment (also Agriculture and Life Sciences 469) Spring. 3 credits. Prerequisite: one year of introductory biology or permission of instructor. Lecs, T R 12:20; disc, W evenings and by arrangement. K. A. R. Kennedy. 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.

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.

472 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.

474 Laboratory and Field Methods in Human Biology Spring. 4 credits. Prerequisite: one year of introductory biology or Anthropology 114, or permission of instructor. Offered alternate years. Fee, $5. Lecs and labs, T R 10:10 - 12:05; additional hours to be arranged. Independent research project required. K. A. R. Kennedy.

475 Ornithology Fall. 4 credits. Recommended: Biological Sciences 274. S-U grades optional, with permission of instructor. Offered alternate years. Not offered 1983–84. Lecs, M W F 10:10. M. Alex Smith.
Lecs and labs. T R 12:20–4:25; occasional field trips and special projects. T. J. Cade. Lectures cover various aspects of the biology of birds, including anatomy, physiology, classification, evolution, migration, and orientation. Behavior, ecology, and distribution, and are fully integrated with laboratory studies. Laboratory includes studies of external and internal morphology, plumages, and plumages, specimen identification of birds of New York, and families of birds of the world. Several demonstration periods emphasize hybridization, evolution, adaptive radiation, mimicry, and geographic variation.

[673 (479) Human Evolution: Concepts, History, and Theory Fall. 3 credits. Prerequisite: one year of introductory biology or Anthropology 114, or permission of instructor. Not offered 1983–84. Sem, W 7:30–9:30 p.m., additional hours to be arranged. K. A. Kennedy. The historical background of present-day concepts of man’s evolution and the adaptations in space and time is surveyed. The formation of biological anthropology as an area of scientific inquiry within the social sciences is reviewed.]

[674 Principles of Systematics (also Entomology 674)] Spring. 4 credits. Limited to 15 students. Prerequisite: permission of instructor. Recommended: an introductory biological systematics course. Lecs and labs. M W 12:50–2:50, disc to be arranged. O. D. Wheeler and staff. An introduction to modern theory and methods of systematic biology. Lectures are on theoretical systematics and includes (but is not limited to) classification, phylogenetics, and biogeography. Laboratories include modern methods of finding character states (e.g., comparative morphology, karyology, electrophoresis, ontogenetic sequencing) and various 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. Offered alternate years. Not offered 1983–84. Lecs, M W F 9:05. B. F. Chabot and staff. Comparison of the responses and adaptations of organisms to environment in selected ecosystems. Emphasis on similarities and differences in molecular and organizational mechanisms by which plants and animals cope with their environments. Lecs, M W F 9:05. B. F. Chabot and staff. Comparison of the responses and adaptations of organisms to environment in selected ecosystems. Emphasis on similarities and differences in molecular and organizational mechanisms by which plants and animals cope with their environments.

661 Environmental Biology (also Agriculture and Life Sciences 661) Fall or spring. 2 or 3 credits each term. Limited to 12 students. Prerequisite: permission of instructor. Hours to be arranged. D. Pimentel. This course uses an interdisciplinary approach to focus on complex environmental and energy problems. Topics include: (1) energy use by humans, 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.


[664 Seminar in Coevolution between Insects and Plants (also Entomology 664)] Spring. 2 credits. Intended for seniors who have completed a course in evolution, migration, and orientation; and written permission of instructor. S-U grades optional. Offered alternate years. Sem, 1 evening each week to be arranged. P. P. Feeny. Presentations and discussions by students on the evolution of patterns of interaction between plants and insects, emphasizing critical evaluation of concepts and evidence.

665 Limnology Seminar Fall. 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. Staff. A seminar course on advanced limnological topics.

666 Marine Ecology Spring. 3 credits. Prerequisite: Biological Sciences 260 or 360, or written permission of instructor. Recommended: Biological Sciences 461. S-U grades optional. Lecs, M W F 9:05. J. P. Barlow. An introduction to biological oceanography, including adaptation of organisms to the physical environment, oceanographic principles and methods, and the study of marine ecosystems, with special emphasis on the study of marine ecosystems, with special emphasis on current research in coastal and estuarine regions.

[667 Topics in Theoretical Ecology Fall. 3 credits. Primarily for graduate students; permission of instructor required for undergraduates. Prerequisite: one year of calculus. Recommended: Biological Sciences 662. S-U grades optional. Offered alternate years. Not offered 1983–84. Lecs, 3 hours each week to be arranged. S. A. Levin. Prearranged. Current and classical theoretical issues in ecology and evolutionary biology. Biological issues are emphasized, although mathematical models are utilized as well as tools to address those issues. Lectures cover both standard material and current journal articles.]

[668 Phytoplankton Ecology: An Experimental Approach Spring. 2 credits. Prerequisites: Biological Sciences 360 and Agronomy 410, or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1983–84. Lecs and discus to be arranged. G-Y. Rhee. Ecological observations in nature interpreted with respect to the findings of algal culture studies. Emphasis is placed on photosynthesis, nutrient limitation, temperature, light intensity, and other physiological and environmental variables. The theory and use of various culture methods are also emphasized.]

669 Plant Ecology Seminar Spring. 1 credit. May be repeated for credit. Suggested for students majoring or minoring in plant ecology. S-U grades optional. Sem to be arranged. P. L. Marks. Includes review of current literature, student research, and selected topics of interest to participants.

670 Graduate Seminar in Vertebrate Biology Fall or spring. 1 credit. May be repeated for credit. Primarily for graduate students; written permission of instructor required for undergraduates. S-U grades only. Sem to be arranged. Vertebrate biology staff. Seminar presentations and discussions by students on areas of current research in vertebrate biology. Topics vary from semester to semester.
Teaching Experience (Biological Sciences 496)

Topics in Ecological Anthropology: Food Production and Social Organization (Anthropology 677)

Undergraduate Research in Biology (Biological Sciences 499)

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 T W or R 2:30–4:25. Additional hours to be arranged. Lab sections may also be scheduled T or R 8:00–9:55, W or F 10:10–12:05, F 2:30–4:25, or S 10:10–12:05 if enrollment requirements exist. Students do not choose lab sections during course enrollment; lab assignments are made during first day of class. Staff. 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 chromosomal mutations, genetic aspects of differentiation, genetics in populations, breeding systems, and inheritance. 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 section 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 (1 disc section R 10:10, 2 sections R 11:15, 4 sections F 10:10, and 1 section F 11:15), A. M. Stel. An introduction to biological heredity through consideration of human genetics. Advances in the science of genetics are having a profound effect on our understanding of ourselves and 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.


[389] Embryology  Spring, also offered during the 6-week summer session in odd-numbered years. 4 credits. Prerequisite: one year of introductory biology. Offered alternate years. Not offered 1983–84.

Lecs. M W 11:15, labs. M W 2:45–4:25. A. W. Blackler. A course in the embryonic development of animals, with emphasis directed to the vertebrate groups and to the comparative aspects of morphogenesis and function. Invertebrate material is used on occasion to illustrate embryiological principles. The laboratory has a strong morphogenetic theme, and stresses 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. M. F. Wotton.

[481] Population Genetics  Fall. 3 credits. Prerequisite: Biological Sciences 281 or equivalent. Not offered 1983–84.


Lecs. M W F 11:15. Staff. An examination of the molecular biology of developing systems. Emphasis on understanding mechanisms involved in gene expression in developing systems, both at the transcription and translation levels. Specific topics include regulation of RNA synthesis and use, nucleo-cyttoplasmic interactions, and induction of cell-specific protein synthesis. Examples are discussed from both higher and lower eucaryotic systems.

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 7:30–9:35 p.m. S. A. Zahler. Genetics of bacteria and their viruses, with emphasis on the mechanisms of genetic phenomena.

486 Immunogenetics (also Animal Science 486)  Spring. 4 credits. Enrollment limited. Prerequisites: Biological Sciences 281 or Animal Science 221, and a course in immunology or permission of instructor.


487 Microbial Genetics, Laboratory  Fall 3 credits. Primarily for upperclass students. Limited to 20 students. Prerequisites: concurrent or previous enrollment in Biological Sciences 485, Microbiology 290 or equivalent, and written permission of instructor.

Lab. T 1:25–4:25, additional hours to be arranged. S. A. Zahler. Problem solving in bacterial genetics.

780 Current Topics in Genetics  Spring. 2 credits. May be repeated for credit. Primarily for graduate students, with preference given to majors in the Field of Genetics; written permission of instructor required for undergraduates. Limited to 20 students. No auditors. S-U grades optional, with permission of instructor.

Sem to be arranged. T. D. Fox. 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)
Behavioral Neurogenetics (Biological Sciences 624)
Current Topics in Biochemistry (Biological Sciences 731–736)
Cytogenetics (Biological Sciences 446)
Cytology (Biological Sciences 347)
Invertebrate Embryology (Biological Sciences 482)
Organic Evolution (Biological Sciences 477)
Physiological Genetics of Crop Plants (Plant Breeding 605)
Plant Growth and Development (Biological Sciences 644)
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 is required of students concentrating in neurobiology and behavior. Each disc section limited to 20 students, with preference given to students concentrating in neurobiology and behavior. 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.
S. T. Emlen.
A general introduction to the field of behavior and integrative neuroscience. Topics include evolution and behavior, behavioral ecology, altruism, communication, neuroethology, myrmecology, 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 is required of students concentrating in neurobiology and behavior. Each disc section limited to 20 students, with preference given to students concentrating in neurobiology and behavior. Prerequisite: one year of introductory biology for majors. May be taken independently of Biological Sciences 221. S-U grades optional.
Lecs. M W F 12:20, disc to be arranged.
R. R. Hoy.
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 a course in psychology.
S-U grades optional.
Lecs. T R 10:10–11:30; disc to be arranged.
E. Adkins Regan, T. DeVogd.
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. 3 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.

395 Vision (also Applied and Engineering Physics 611) Fall. 3 credits. Prerequisites: Chemistry 104 or 208; Mathematics 106, 111, or 113; and either Physics 102 or 206; or permission of instructor. Offered alternate years.
A study of the mechanism of seeing that includes biological, physical, and chemical approaches to the subject.

396 Introduction to Sensory Systems (also Psychology 396) Spring. 3 or 4 credits (4 credits with discussion and term paper). No auditors.
Prerequisites: an introductory course in biology or biopsychology, and a second course in neurobiology or behavior or perception or cognition or biopsychology; students are expected to have elementary knowledge of neurophysiology, neurobehavior, and chemistry. S-U grades optional for graduate students only.
Lecs. M W F 9:05; B. P. Hattem.
Students read 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 are specific to particular habitats or environments. The principles and limitations of major methods used to examine sensory systems are covered. General characteristics of sensory systems and auditory, visual, and somesthetic systems are to be covered in spring 1984. One aspect of each system (e.g., localization of objects in space by sound, color vision, and thermoreception) is selected for special emphasis. The course is taught in the Socially method, in which the instructor asks questions of the students. At the level of Neurones without Impulses, edited by Roberts and Bush, and Recognition of Complex Acoustic Signals, edited by Bullock.

420 Seminar in Neurobiology and Behavior Fall or spring. Variable credit. May be repeated for credit. Prerequisites: Biological Sciences 221 and 260 or 360. S-U grades optional; with permission of instructor. Offered alternate years. Not offered 1983–84.
Lecs. M W F 10:10, disc to be arranged.
S. T. Emlen.
The study of the adaptive bases of social behavior is examined. The first half of the course deals with ecological sociobiology: the effects of ecological constraints of resource dispersion and predation pressures upon the structure of animal societies, the adaptiveness of territoriality and coloniality; the evolution of cooperative and communal social systems; and the functional basis of polygamy, and promiscuous mating systems. The second half of the course emphasizes genetic sociobiology: the predictions from individual- and kin-selection theory for various types of social interactions, e.g., female mate choice; mate selection; the role of the male in parental care; parent-offspring conflict; behavioral nepotism; and the evolution of phenotypic altruism. Finally, the course examines the impact of the emerging field of sociobiology upon its sister biological and social sciences.

427 Vertebrate Social Behavior Fall. 3 credits. Prerequisite: Biological Sciences 221, and 260 or 360. S-U grades optional; with permission of instructor. Offered alternate years. Not offered 1983–84.
Lecs. M W F 9:05; lab and disc. 1 R 12:25–4:25; S field trips during the field season; 2 weekend field trips and occasional evening meetings. Enrolled students must participate in all aspects of the course; no partial credit given. P. W. Sherman.
A course for juniors and first-year graduate students interested in field research on animal behavior. Lecture-discussion areas include design of field experiments, hypothesis testing, data analysis, and current topics in evolutionary ecology and behavior. Laboratory field sessions acquaint students with observation techniques, research methods, and the behavioral biology of plants, insects, fishes, amphibians, birds, and mammals of upstate New York.

429 Animal Social Behavior Fall. 3 credits. Limited to 45 students. May be repeated for credit with permission of instructor. Prerequisite: Biological Sciences 221. S-U grades optional. Not offered 1983–84.
This course examines animal social behavior and social organization in a phylogenetic perspective. A different taxonomic group serves as the focus of the course each year.

491 Principles of Neurobiology, Laboratory (also Psychology 491) Fall. 4 credits. Limited to 24 students. Prerequisite: Biological Sciences 396 or 496, or written permission of instructor.
Labs. M W or T R 12:20–4:25; additional hours to be arranged. B. R. Capranica.
Laboratory practice with neurobiological preparations and experiments, designed to teach the techniques, experimental designs, and research strategies used to study biophysical and biochemical properties of
3 credits. Prerequisite: Biological Sciences 496 or 222, or permission of instructor. Offered alternate years. Lecs, T R 9:05. disc to be arranged.

R. B. Campenot.
The embryologic development of the nervous system is considered in the light of both historical and current research. Emphasis is on cellular issues, that is, how do nerve cells differentiate both morphologically and biochemically, and how do they interact to produce a properly wired nervous system?

495 Molecular Neurobiology Fall. 3 credits. Prerequisites: Biological Sciences 496 and either 330 or 331. S-U grades optional. Offered alternate years. Lecs, M W 9:05 disc, 2 hours alternate weeks to be arranged. T. R. Podleski.

An examination of molecular aspects of neurobiology. Topics to be discussed include chemosensitive and chemosensitive gates, biochemical characterization of gates and ion channels, the structure of neurotransmitter receptors and the cloning of DNA specific for these receptors, and molecular aspects of hormonal control of nervous systems and neural circuits. The ultrastructure of neurons and that of sensory neurotransmitter receptors and the cloning of DNA species for these receptors, and molecular aspects of hormonal control of nervous systems and neural circuits. The ultrastructure of neurons and that of sensory receptors are presented, with an emphasis on identifying the molecular components of these cells and their neuronal activity. In addition, emphasis is placed on the cytoskeletal organization and its interaction with the plasma membrane in regulating neuronal function, as well as interaction between plasma membrane and the extracellular matrix.

497 Neurochemistry Fall. 3 credits. Limited to 30 students. Prerequisites: Biological Sciences 496 and either 330 or 331, or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1983–84.

Lecs and disc, M W F 9:05. R. M. Harris-Warrick. The course focuses primarily on synaptic neurochemistry. The presynaptic regulation and postsynaptic mechanism of action of the major classes of neurotransmitters are discussed, as well as selected neuropeptides and hormones. The relevant mechanisms of normal brain function and neurological disorders are described. Readings are primarily from journal articles.

623 Chemical Communication (also Chemistry 622) Fall. 3 credits. Primarily for research-oriented students. Limited to 30 senior and graduate students. Prerequisites: one year of introductory biology for majors or equivalent, course work in biochemistry, and Chemistry 358 or equivalent. Offered alternate years.

Lecs, M W F 1:25. T. E. Eisner. J. Meinwald, W. L. Roelfs, 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, neurobiological, ecological, and evolutionary principles.


Lecs, T R 9:05 disc and demonstration to be arranged. R. H. Lea.
The study of the neurogenetic basis of behavior in animals, using "simple" behaviors that can be analyzed genetically and neurobiologically. Both vertebrate and invertebrate animals are discussed, although emphasis is on the invertebrates. Lectures and assigned readings draw heavily from journal articles.

627 Quantitative Approaches to Animal Behavior Spring. 3 credits. Primarily for graduate students; written permission of instructor required for undergraduates. Enrollment limited. Prerequisite: Biological Sciences 221 or equivalent. S-U grades optional, with permission of instructor. Offered alternate years. Not offered 1983–84.

Lecs and disc, T R 10:10–11:30. Staff. The course emphasizes a quantitative approach to research on animal behavior. Lectures, discussions, and readings focus on the formulation of precise, testable hypotheses for behavior research, especially mathematical models, and on the use of systematic sampling techniques in observational research. Basic probability distributions are introduced and used in the analysis of behavior sequences and interaction patterns. Stochastic models of behavior are also discussed.

695 Physiological Optics Fall. 3 credits. Limited to 24 students. Recommended: courses in elementary biology, psychology, and physics, and courses appropriate to particular track (see below) Offered alternate years. 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, measurement of MTF and contrast sensitivity, and the vegetative physiology of the eye relevant to optical quality of the optical image. 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 in 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 and students.

Designed to provide several study groups each semester on specialized topics. A group may meet for whatever period is 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 chairman of the Section of Neurobiology and Behavior.

Related Courses in Other Departments

Animal Behavior (Psychology 535)
Biochemistry and Human Behavior (Psychology 381 and Nutritional Sciences 361)
Brain and Behavior (Psychology 425)
Developmental Biopsychology (Psychology 422)
Evolution of Human Behavior (Psychology 326)
Human Behavior: A Sociobiological Perspective (Anthropology 476)
Insect Behavior Seminar (Entomology 662)
Mammalian Neurophysiology (Biological Sciences 450)
Teaching Experience (Biological Sciences 498)
Undergraduate Research in Biology (Biological Sciences 499)
368 Introduction to Nautical Science

3 credits. Prerequisites: College algebra or equivalent, and concurrent enrollment in Biological Sciences 366 and 367. An introduction to the technologies of operation at sea. The concepts of navigation (plotted, celestial, and electronic), nautical architecture, ship construction, marine engineering systems, and the physics of sail are taught from their bases in astronomy, mathematics, physics, and engineering. The theoretical foundation for the navigation, seamanship, and engineering that the student employs at sea.

Sea Component (six weeks)

Courses 369 and 370 take place aboard the R/V Westward, a 250-ton, steel auxiliary-powered sailboat schooner built in 1961. Westward normally puts to sea with a ship's company of thirty-four. The professional crew includes the captain, 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 Oceanographic Laboratory I

4 credits. Prerequisites: Biological Sciences 366. Theories and problems raised in the shore component are tested in the practice of oceanography at sea. Students are introduced to the tools and techniques of the practicing oceanographer. During lectures and watch standing, students are instructed in the operation of basic oceanographic equipment; in the methodologies involved in the collection, reduction, and analysis of oceanographic data, and in the attendant operations of a sailing oceanographic research vessel.

370 Oceanographic Laboratory II

4 credits. Prerequisites: Biological Sciences 366. Building on the experience of Oceanographic Laboratory I, students assume increasing responsibility for conducting oceanographic research and overseeing operations of the vessel. The individual student is ultimately responsible directly to the chief scientist and the master of the vessel for the safe and orderly conduct of research activities and related operations of the vessel. Each student undertakes an individual research project designed during the shore component.

413 Adaptations of Marine Organisms

Summer 4 credits. Prerequisite: Biological Sciences 364 or 315 or a course in physiological ecology. S-U grades optional. A special 3-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, Stimson G14. Estimated cost (includes tuition, room and board, and ferry transportation), $925. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

473 Topics in Marine Vertebrates

Summer 4 credits. Prerequisites: Biological Sciences 364 or 274 or a course in vertebrate biology. S-U grades optional. A special 3-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, Stimson G14. Estimated cost (includes tuition, room and board, and ferry transportation), $925. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

482 Invertebrate Embryology

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. 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, Stimson G14. Estimated cost (includes tuition, room and board, and ferry transportation), $910. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

441 Field Phycology

Summer 4 credits. Prerequisite: Biological Sciences 364 or general familiarity with marine algae. S-U grades optional. A special 3-week course offered at Cornell's Shoals Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, Stimson G14. Estimated cost (includes tuition, room and board, and ferry transportation), $910. Daily lecs, labs, and fieldwork for 3 weeks. SML faculty.

Coastal and Oceanic Law and Policy (Natural Resources 306)

Summer 1 credit. A special 1-week course offered at Cornell's Shoals Marine Laboratory.
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** (Archaeology 319) Summer 1 credit. Prerequisite: recognized scuba certification and a medical examination required for students engaging in underwater research. A special 1-week course offered at Cornell’s Shallows Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, Stimson G14. Estimated cost (includes tuition, room and board, and ferry transportation). $340.

Daily lecs, labs, and fieldwork for 1 week. SML faculty.

An introduction to the subject and a review of this contemporary sub-discipline of archaeology. The approach of the course is practical, with 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 this archaeological research project involves a great deal more than diving, 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 Shallows Marine Laboratory (SML), on an island off Portsmouth, N.H. For more details and application, consult the SML office, Stimson G14. Estimated cost (includes tuition, room and board, and ferry transportation). $340.

Daily lecs, labs, and fieldwork for 1 week. SML faculty.

An examination of coastal and adjacent freshwater wetlands, both on-shore and in-shore, 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 geological sciences major (see option 6 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, 210 Clark Hall.

The following courses are available for students interested in biophysics:

**Biomechanical Systems—Analysis and Design** (Mechanical and Aerospace Engineering 565)

**Chemistry of Nucleic Acids** (Chemistry 677)

**Electron Microscopy for Biologists** (Biological Sciences 600, 602, 603, 604, 606, 608)

**Enzyme Catalysis and Regulation** (Chemistry 672)

**Introduction to Biophysics** (Applied and Engineering Physics 206)

**Membrane Biophysics** (Applied and Engineering Physics 615)

Membranes and Bioenergetics (Biological Sciences 632)

Modern Physical Methods in Macromolecular Characterization (Applied and Engineering Physics 616)

Neuroelectric Systems (Biological Sciences 422 and Electrical Engineering 422)

Neuroethology (Biological Sciences 424)

Photosynthesis (Biological Sciences 445 and Applied and Engineering Physics 501)

Physical Chemistry of Proteins (Chemistry 686)

Physics of Macromolecules (Physics 464)

Principles of Neurobiology, Laboratory (Biological Sciences 491 and Psychology 491)

Protein Structure and Function (Biological Sciences 631)

Special Topics in Biophysical and Bioorganic Chemistry (Chemistry 792)

Special Topics in Biophysics (Applied and Engineering Physics 614)

Transport of Solutes and Water in Plants (Biological Sciences 649)

Vision (Biological Sciences 395 and Applied and Engineering Physics 611)

**Faculty Roster**

New York State College of Agriculture and Life Sciences

Adler, Craig K., Ph.D., U. of Michigan. Prof., Neurobiology and Behavior

Barker, Robert, Ph.D., U. of California at Berkeley. Prof., Biochemistry, Molecular and Cell Biology.*

Barlow, John P., Ph.D., Harvard U. Assoc. Prof., Genetics and Development.*

Brussard, Peter E., Ph.D., Stanford U. Assoc. Prof., Neurobiology and Behavior.


Bryant, David W., Ph.D., U. of California at Los Angeles. Prof., Biology.

Buchanan, John, Ph.D., U. of Wisconsin at Madison. Prof., Neurobiology and Behavior.

Brunner, Peter J., Ph.D., U. of Illinois. Prof., Genetics and Development.*


Clayton, Roderick K., Ph.D., California Inst. of Technology. Prof., Plant Biology and Plant Genetics.

Clayton, Roderick K., Ph.D., California Inst. of Technology. Prof., Plant Biology and Plant Genetics.


Edelestein, Stuart J., Ph.D., U. of California at Berkeley. Prof., Biochemistry, Molecular and Cell Biology.*

Eisner, Thomas, Ph.D., Harvard U. Jacob Gould Schurman Professor, Neurobiology and Behavior.


Fox, Thomas D., Ph.D., Harvard U. Asst. Prof., Neurobiology and Behavior.


Goldberg, Michael L., Ph.D., Stanford U. Asst. Prof., Genetics and Development.*

Harris-Warrick, Ronald M., Ph.D., Stanford U. Asst. Prof., Neurobiology and Behavior.

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(SML) on an island off Portsmouth, N.H. For more details and application, consult the SML office, Stimson G14. Estimated cost (includes tuition, room and board, and ferry transportation). $315.

Daily lecs and discs for 1 week. SML faculty. Resource economics in general is concerned with the optimal allocation of a society's time to 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.
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 Hortorum
Jagendorf, Andre T., Ph.D., Yale U. Liberty Hyde Bailey Professor of Plant Biology, Plant Biology
Kelner, Elizabeth B., Ph.D., Cornell U. Assoc. Prof., Biochemistry, Molecular and Cell Biology
Lis, John T., Ph.D., Cornell U. Asst. Prof., Biochemistry, Molecular and Cell Biology
Loew, Ellis R., Ph.D., U. of California at Los Angeles, Assoc. Prof. Physiology/Veterinary Physiology
McCarrick, 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
McDonald, Russell E., Ph. D., U. of Michigan. Prof., Biochemistry, Molecular and Cell Biology
MacIntyre, Ross J., Ph.D., New York U. Medical School. Assoc. Prof., Biochemistry, Molecular and Cell Biology
Moffat, J. Keith, Ph.D., Cambridge U. (England), Assoc. Prof. Biology, Molecular and Cell Biology
Paolillo, Dominick J., Ph. D., U. of California at Davis. Prof., Plant Biology
Parthasarathy, Mandayam V., Ph. D., Cornell U. Assoc. Prof., Biology, Molecular and Cell Biology
Pough, F. Harvey, Ph.D., U. of California at Los Angeles. Prof., Ecology and Systematics/Physiology
Quarone, Andrea, Ph.D., U. of Pavia (Italy), Assoc. Prof., Physiology
Roberts, Jeffrey W., Ph.D., Harvard U. Assoc. Prof., Biochemistry, Molecular and Cell Biology
Rout, Richard B., Ph. D., U. of California at Berkeley. Prof., Ecology and Systematics/Entomology
Spanswick, Roger M., Ph. D., U. of Edinburgh (Scotland). Prof., Plant Biology
Stein, Adrian M., Ph.D., Stanford U. Assoc. Prof., Biology, Molecular and Cell Biology
Tye, Bik-Kwoon, Ph.D., Massachusetts Inst. of Technology, Assoc. Prof., Biochemistry, Molecular and Cell Biology
Uhi, Charles H., Ph.D., Cornell U. Assoc. Prof., Plant Biology
Uhi, Natalie W., Ph. D., Cornell U. Assoc. Prof., Bailey Hortorum
Vogt, Volker M., Ph.D., Harvard U. Asst. Prof., Biochemistry, Molecular and Cell Biology
Walcott, Charles, Ph.D., Cornell U. Prof., Neurobiology and Behavior/Laboratory of Ornithology
Whatman, Michael D., Ph.D., U. of Texas at Austin. Assoc. Prof., Bailey Hortorum/Ecology and Systematics
Young, David A., Ph. D., Claremont Graduate School. Assoc. Prof., Bailey Hortorum
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
Calvo, Maria L., Ph.D., U. of Chile. Lecturer, Biochemistry, Molecular Cell Biology
Reiss, H. Carol, M.S., Cornell U. Lecturer, Plant Biology
Wilkinson, Maria L., Ph.D., U. of Chile. Lecturer, Biochemistry, Molecular and Cell Biology

Joint Appointees
Alexander, Martin, Liberty Hyde Bailey Professor of Soil Science, Agronomy and Ecology and Systematics
Bloom, Stephen E., Assoc. Prof., Poultry and Avian Sciences/Biology
Borror, Arthur C., Adjunct Prof. U. of New Hampshire/Biological Sciences
Brown, William L., Jr., Prof., Entomology/Ecology and Systematics
Butler, Walter R., Asst. Prof., Animal Science/Physiology
Currie, W. Bruce, Assoc. Prof., Animal Science/Physiology
Delwiche, Eugene A., Prof., Microbiology/Biological Sciences
Foote, Robert H., Jacob Gould Schurman Professor, Animal Science/Physiology
Kot, Richard P., Prof., Plant Pathology/Bailey Hortorum
LaRue, Thomas A., Adjunct Prof., Boyle Thompson Institute/Plant Biology
Leopold, A. Carl, Adjunct Prof., Boyle Thompson Institute/Plant Biology
Novak, Joseph D., Prof., Education/ Biological Sciences
Pienmale, David, Prof., Entomology/Ecology and Systematics
Richmond, Milo E., Assoc. Prof., USDI Fish and Wildlife Service/Natural Resources/Ecology and Systematics
Slay, Alaida A., Adjunct Asst. Prof., Boyle Thompson Institute/Biological Sciences
Spanswick, Roger M., Ph. D., U. of Edinburgh (Scotland). Prof., Plant Biology
VanDemark, Paul J., Prof., Microbiology/Biological Sciences
vanderHoven, Ari, Prof., Poultry and Avian Sciences/Physiology
Wheeler, Quentin D., Asst. Prof., Entomology/Bailey Hortorum

College of Arts and Sciences
Blackler, Antonie W., Ph.D., U. of London (England), Prof., Genetics and Development
Campenot, Robert B., Ph.D., Massachusetts Inst. of Technology. Asst. Prof., Neurobiology and Behavior
Caporulo, Robert R., Sc.D., Massachusetts Inst. of Technology. Prof., Neurobiology and Behavior/Electrical Engineering*
Chabot, Brian F., Ph.D., Duke U. Assoc. Prof., Ecology and Systematics
Dilgur, William C., Ph.D., Cornell U. Assoc. Prof., Neurobiology and Behavior
Emlen, Stephen T., Ph.D., U. of Michigan. Prof., Neurobiology and Behavior
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
Gibson, Quentin H., Ph.D./D.Sc., Queen's U. (Northern Ireland). Greater Philadelphia Professor in Biological Sciences, Biochemistry, Molecular and Cell Biology
Hall, Charles A., Ph.D., U. of North Carolina at Chapel Hill. Asst. Prof., Ecology and Systematics
Halsem, Bruce P., Ph.D., Brown U. Prof., Neurobiology and Behavior/Psychology
Heppe1, Leon, 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
Howland, Howard C., Ph.D., Cornell U. Assoc. Prof., Neurobiology and Behavior/Physiology
Hoy, Ronald A., Ph.D., Stanford U. Assoc. Prof., Neurobiology and Behavior
Kennedy, Kenneth A. R., Ph.D., U. of California at Berkeley. Prof., Ecology and Systematics
Land, Bruce R., Ph.D., Cornell U. Asst. Prof., Neurobiology and Behavior/Electrical Engineering*
Levin, Simon A., Ph. D., U. of Maryland at College Park. Prof., Ecology and Systematics
McFarland, William N., Ph.D., U. of California at Los Angeles. Prof., Ecology and Systematics/Physiology
Podleski, Thomas R., Ph.D., Columbia U. Prof., Neurobiology and Behavior
Rabinowitz, Deborah, Ph.D., U. of Chicago. Assoc. Prof., Ecology and Systematics
Racker, Efrem, M.D., U. of Vienna (Austria). Albert Einstein Professor of Biochemistry, Biochemistry, Molecular and Cell Biology
Salpeter, Miriam M., Ph.D., Cornell U. Prof., Neurobiology and Behavior/Appplied and Engineering Physics
Sherman, Paul W., Ph.D., U. of Michigan Asst. Prof., Neurobiology and Behavior
Torgeon, Robert E., Ph.D., Cornell U. (Canada). Asst. Prof., Plant Biology
Wilson, David B., Ph.D., Stanford U. Assoc. Prof., Biochemistry, Molecular and Cell Biology
Wernsatt, William A., Ph.D., Cornell U. Prof., Genetics and Development/Physiology
Wolf, Marissa F., Ph.D., Stanford U. Prof., Genetics and Development
Wu, Ray H., Ph.D., U. of Pennsylvania. Prof., Biochemistry, Molecular and Cell Biology

Other Teaching Personnel
Eberhard, Carolyn, Ph.D., Boston U. Sr. Lecturer, Plant Biology
Schaffner, William R., Ph.D., Cornell U. Lecturer, Ecology and Systematics

Joint Appointees
Hammer, Gordon G., Horace White Professor of Chemistry and Biochemistry, Chemistry, Biochemistry, Molecular and Cell Biology
Likens, Gene E., Adjunct Prof., New York Botanical Garden Cary Arboretum/Ecology and Systematics
Leopold, A. Carl, Jr., Liberty Hyde Bailey Professor of Animal Physiology, Physiology/Veterinary Physiology
Lengeman, Frederick W., Ph.D., U. of Wisconsin at Madison. Prof., Physiology/Veterinary Physiology
Tupper, Daniel N., Ph.D., Cornell U. Prof., Physiology/Neurobiology and Behavior
Rhee, G-Youl, Adjunct Assoc. Prof., New York State Department of Health/Ecology and Systematics

New York State College of Veterinary Medicine
Corradino, Robert A., Ph.D., Cornell U. Assoc. Prof., Physiology/Veterinary Physiology
Gasterlee, 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*
Lengeman, Frederick W., Ph.D., U. of Wisconsin at Madison. Prof., Physiology/Veterinary Physiology
Tupper, Daniel N., Ph.D., Cornell U. Prof., Physiology/Neurobiology and Behavior/Veterinary Physiology
Wasserman, Robert R., Ph.D., Cornell U. Prof., Physiology/Veterinary Physiology/Nutritional Sciences

Joint Appointees
Bergman, Emmett N., Prof., Veterinary Physiology/Physiology
Dobson, Alan, Prof., Veterinary Physiology/Physiology
Evans, Howard E., Prof., Anatomy/Biological Sciences

238 Biological Sciences
Gillespie, James H., Prof., Microbiology/Biological Sciences
Houpt, Katherine A., Asst. Prof., Veterinary Physiology/Physiology
Houpt, T. Richard, Prof., Veterinary Physiology/Physiology
Sharp, Geoffrey W. G., Prof., Pharmacology/Physiology

College of Engineering

Joint Appointee
Cisne, John L., Asst. Prof., Geological Sciences/Biological Sciences

Division of Biological Sciences

Stinson, Harry T., Jr., Ph D., Indiana U. Prof., Biological Sciences

Division of Nutritional Sciences

Joint Appointees
Arion, William J., Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Bensadoun, Andre, Prof., Nutritional Sciences/Physiology
Kazarinoff, 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.
Graduate School of Business and Public Administration

Administration

David A. Thomas, dean
Robert H. Smiley, associate dean for academic affairs
James W. Schmott, assistant dean for admissions and student affairs
Albert E. Brill, assistant dean for placement
JoAnne F. Kloppenburg, director of financial aid and registrar
Ann L. Calkins, assistant dean for external affairs
Dr. Peter G. Zoepfr, assistant dean for student affairs
Caroline Violette, director of student activities and special projects

The Graduate School of Business and Public Administration prepares men and women for managerial careers in private business, public service, and health care. The school offers course work in many disciplines to provide potential business, public, and health 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.), Master of Public Administration (M.P.A.), or Master of Professional Studies (Hospital and Health Services Administration) (M.P.S. (H.H.S.A.)). Students may also earn an M.B.A. with a concentration in public or health administration. 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 of Business and Public Administration, provides an advanced and comprehensive education in administration, primarily for those who seek careers in teaching and research.

More detailed information about these programs is available in the Announcement of the Graduate School of Business and Public Administration, obtainable from the Assistant Dean for Admissions and Student Affairs, Graduate School of Business and Public Administration, Malott Hall.

Undergraduate Only

NBA 300 Entrepreneurship and Small Business Management 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/or 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, venture capital sources, as well as planning techniques necessary to a successful venture.

NCC Common Core Courses

NCC 500 Financial Accounting
NCC 501 Quantitative Methods for Management
NCC 502 Economic Principles for Management
NCC 503 Introduction to Computer Programming
NCC 504 Introduction to Management Information Systems

NBP Business Administration Program Core Courses

NBP 500 Marketing Management
NBP 501 Production and Operations Management
NBP 502 Managerial Finance
NBP 503 Business Policy
NBP 504 Introduction to the Business-Government Interface

NBA Business Administration Elective Courses

NBA 500 Intermediate Accounting
NBA 501 Advanced Accounting
NBA 502 Managerial Cost Accounting
NBA 504 Introduction to Taxation Affecting Business and Personal Decision Making
NBA 505 Auditing
NBA 506 Financial Information Evaluation
NBA 507 Federal Income Tax
NBA 510 Law of Business Associations
NBA 511 Advanced Business Law
NBA 514 Financial Policy Decisions
NBA 515 Economic Evaluation of Capital Investment Projects
NBA 516 Investment Management
NBA 517 Security Analysis
NBA 518 Financial Markets and Institutions
NBA 521 Finance Theory
NBA 524 Options, Bonds, and Commodities
NBA 525 Investment Banking
NBA 541 Marketing Research
NBA 543 Marketing Strategy
NBA 546 Marketing Decision Analysis
NBA 548 Marketing Management of Industrial Products
NBA 551 Consumer Behavior

NBA 552 Special Topics in Marketing Management
NBA 554 Advertising Practicum
NBA 559 Research Seminar in Operations Management
NBA 562 Business Logistics Management
NBA 563 Policy Issues for the 80s
NBA 564 Entrepreneur and Small Business Management

NPP Public Administration Core Courses

NPP 500 Economic Foundations of Public Policy
NPP 501 Public Financial Management
NPP 502 Industrial Policy—Lessons for the U.S. from Japan and Europe
NPP 503 The Conduct of Public Affairs

NPA Public Administration Elective Courses

NPA 500 Management of Urban Issues
NPA 512 Seminar in Public Systems Analysis
NPA 515 The Politics of Technical Decisions I
NPA 516 The Politics of Technical Decisions II
NPA 518 Public Affairs Colloquium
NPA 520 Legal Process

NHP Hospital and Health Services Administration Core Course

NHP 500 Introduction to Health Services

NHA Hospital and Health Services Administration Elective Courses

NHA 501 Hospital Strategic Planning
NHA 502 Psychiatric Institutions: Administration and Practice
NHA 503 Primary Health Care Services: Administration and Practice
NHA 504 Legal Aspects of Hospital Administration
NHA 505 Health Services Research and Evaluation
NHA 506 Health Economics
NHA 507 Health and Welfare Policy
NHA 508 HMO Development and Management
NHA 509 Health Operations Management and Planning
NHA 510 Seminar in Hospital Management
NHA 511 Field Studies in Health Administration and Planning
NHA 513 Long-Term Care Services: Policy and Planning
NHA 514 Washington Health Policy Field Seminar
NHA 515 Orientation to Tertiary Hospital Services
NHA 516 Selected Topics in the Administration of Teaching Hospitals
NHA 517 Introduction to Clinical Medicine: The Physician, the Hospital, and the Delivery of Medical Care
NHA 518 Financial Management of Hospitals
NHA 519 International Comparisons of Health Services and Socioeconomic Development
NHA 520 Labor Relations in the Health Industry
NHA 521 State Government Health Policy Seminar

NCE Common Course Electives

NCE 500 Fund Accounting
NCE 504 Political Economy in National and International Perspectives
NCE 505 International Trade and Finance
NCE 506 Politics and Development in the Arabian Gulf
NCE 507 American Business Operations Abroad
NCE 508 International and Competitive Management
NCE 509 International Business Environment: Southeast Asia
NCE 514 Administration of Agricultural and Rural Development
NCE 523 Macroeconomic Theory and Policy
NCE 527 American Industry: Economic Analyses and Public Policy
NCE 528 Topics In Managerial Economics and Public Policy
NCE 540 Organizational Theory and Behavior
NCE 541 Personnel Administration and Human Relations
NCE 542 Processes and Techniques in Organizational Development
NCE 544 Applied Organizational Theory
NCE 545 Stress in Organizations
NCE 547 Negotiations
NCE 548 Power and Influence
NCE 551 Behavioral Decision Theory
NCE 555 Applied Econometrics

NCE 566 Management Science
NCE 568 Introduction to COBOL
NCE 570 Data-Base Management
NCE 571 Computer Systems Analysis
NCE 580 Seminar in University Administration
NCE 581 Management Writing
NCE 582 Oral Communications

NMI and NRE Research
NMI 500-502 Directed Readings and Research
NRE 502 Seminar in Current Research in Marketing
NRE 503 Advanced Capital Market Theory
NRE 504 Accounting Workshop
NRE 505 Finance Workshop
NRE 942 Social Psychology of Organizing

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
Begun, James W., Ph.D., U. of North Carolina. Assoc. Prof., Health Care Administration
Bent, Fredrick T., Ph.D., U. of Chicago. Assoc. Prof., Public Administration
Bierman, Harold, Jr., Ph.D., U. of Michigan. Nicholas H. Noyes Professor of Business Administration, Business Administration
Brooks, Earl, M.S., American U. Prof., Administration
Bugliari, Joseph B., J.D., Cornell U. Prof., Agricultural and Business Law
Chan, Louis, Ph.D., Rochester U. Asst. Prof., Finance
Cockey, Thomas R., Ph.D., U. of Michigan. Ann Whitney Olin Professor of Accounting, Accounting
Eastaugh, Steven R., Sc.D., Johns Hopkins U. Asst. Prof., Health Economics and Hospital Finance
Elliott, John A., Ph.D., Cornell U. Asst. Prof., Accounting
Flash, Edward S., Jr., Ph.D., Cornell U. Assoc. Prof., Public Administration
Hais, Jerome E., Ph.D., Carnegie-Mellon U. Prof., Managerial Economics and Finance
Hilton, Ronald W., Ph.D., Ohio State U. Assoc. Prof., Accounting
Jarrow, Robert A., Ph.D., Massachusetts Inst. of Technology Assoc. Prof., Finance
Krackhardt, David, Ph.D., U. of California-Irvine. Asst. Prof., Organizational Behavior
Lind, Robert C., Ph.D., Stanford U. Prof., Economics and Public Administration
McAdams, 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. Asst. Prof., Accounting
O’Hara, Maureen, Ph.D., Northwestern U. Asst. Prof., Finance
Oldfield, George S., Ph.D., U. of Pennsylvania. Assoc. Prof., Economics and Finance
Orman, Levent, Ph.D., Northwestern U. Asst. Prof., Computer Management
Rao, Vithala R., Ph.D., U. of Pennsylvania. Emerson Electric Company Professor of Marketing, Marketing/Quantitative Analysis

Sebavalla, Danis J., Ph.D., Columbia U. Assoc. Prof., Marketing and Management Science
Smith, Seymour P., Ph.D., U. of Chicago. Nicholas H. Noyes Professor of Economics and Finance, Managerial Economics
Smiley, Robert H., Ph.D., Stanford U. Assoc. Prof., Economics and Public Policy
Swangin, Robert J., Ph.D., U. of Illinois. Prof., Accounting
Thomas, David A., Ph.D., U. of Michigan. Prof., Accounting
Thomas, L. Joseph, Ph.D., Yale U. Prof., Production and Quantitative Analysis
Weick, Karl E., Ph.D., Ohio State U. Nicholas H. Noyes Professor of Organizational Behavior, Psychology and Organizational Behavior
Wittink, Dick R., Ph.D., Purdue U. Assoc. Prof., Marketing and Quantitative Methods

Lecturer
Rosen, Charlotte, Ph.D., Cornell U. Lect., Management Communication

Adjunct and Visiting Faculty
Abelow, William J., J.D., Columbia U. Visiting Assoc. Prof., Labor Relations in the Health Industry
Barnes, Douglas R., Ph.D., Syracuse U. Coordinator, Health Services Development and Continuing Education
Crandall, Robert R., M.B.A., Cornell U. Visiting Prof., Health Policy
Dotson, Arch T., Ph.D., Harvard U. Prof., Government
Esmain, Milton J., Ph.D., Princeton U. John S. Knight Professor of International Studies
Hamilton, Robert, Ph.D., U. of Southern California. Visiting Asst. Prof., Accounting
Kern, John E., M.P.A., Cornell U. Visiting Prof., Health Policy and Planning
LaGrand, Cosmo J., M.P.A., New York U. Visiting Prof., Hospital Administration
Ley, Allyn B., M.D., Columbia U. Visiting Prof., Administrative Medicine
Maynes, E. Scott, Ph.D., U. of Michigan. Visiting Prof., Consumer Economics and Marketing
Thompson, David D., M.D., Cornell U. Visiting Prof., Hospital Administration
Yann, Frederick M.P.A., Cornell U. Visiting Prof., H.M.O. Development and Management
College of Engineering

Administration

Thomas E. Everhart, dean
Donald F. Berth, associate dean
Richard H. Lance, associate dean
William B. Streett, associate dean
Ron W. Simmons, assistant dean
Gilbert F. Rankin, director of administrative operations and facilities
Robert E. Gardner, director of admissions
Mariea T. Blackburn, associate director of admissions
Robert L. Smith, assistant director of admissions
Gladys J. McConkey, director of engineering publications
Jane H. Pirkko, registrar
Elton Shridu

Facilities

Most of the academic units of the College of Engineering are centered in the ten modern buildings located on the Quadrangle. Facilities for applied and engineering physics are located in Clark Hall, on the College of Arts and Sciences campus.

Special facilities used in engineering include the following:

- Computer-Aided Design Instructional Facility (CADIF). A new laboratory providing state-of-the-art computer-graphics technology for engineering course work.
- Cornell Computing Facility. Several IBM mainframe computers running VM/SP CMS, a DECPSYSTEM 2600, a VAX 11/750, microprocessors, microcomputers, and graphics facilities.
- Cornell High Energy Synchrotron Source. A laboratory of the National Science Foundation, which operates in conjunction with the University's high-energy storage ring.
- Laboratory of Plasma Studies. A center for interdisciplinary research in plasma physics and lasers.
- Materials Science Center. Operates central laboratories with sophisticated equipment and supports interdisciplinary research.
- National Astronomy and Ionosphere Center (Arecibo). The world's largest radio-telescope facility, located in Puerto Rico.

Requirements for Graduation

To receive the Bachelor of Science degree, students must meet the requirements of 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 15
2) Physics 12
3) Chemistry 4
4) Freshman Seminar 6
5) Computer programming 4
6) Engineering distribution (4 courses) 12
7) Humanities and social sciences (4 courses) 18
8) Electives: Approved electives 9
Free electives 6
Technical electives 6

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 study are required for the degree.

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.

Students in the College of Engineering begin their undergraduate studies in the Common Curriculum, adopted in 1981, and administered by the faculty members of the Common Curriculum Governing Board (CCGB) through the Office of Undergraduate Affairs. 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 Undergraduate Affairs, 167 Olin Hall.
physical education must be taken in the freshman year to satisfy a University requirement.

Mathematics
The normal program in mathematics includes Mathematics 191 or 193, 192, 293, and 294. Students who have little or no acquaintance with the calculus take Mathematics 191. Students with some knowledge of the 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 105, Introduction to Computer Programming. Before graduation, they must take an additional course with a significant amount of computing applications. Courses that satisfy this requirement are Engr 211, Engr 321, CEE 301, EE 424, M&amp;AE 489, M&amp;AE 670, and M&amp;AE 757.

Engineering Distribution
Four engineering distribution courses (12 credits) are required. These courses must be selected from four of the seven areas listed below. A student may use only one of the possible substitutions described.

1) Scientific computing
Engr 211, Computers and Programming
Engr 321, Numerical Methods

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

4) Probability and statistics
Engr 260, Introduction to Engineering Probability
Engr 270, Basic Engineering Probability and Statistics

Students in the Field Program in Electrical Engineering may substitute EE 310 for Engr 260.

5) Electrical sciences
Engr 210, Introduction to Electrical Systems
A&amp;E 264, Computerized Instrumentation Design

6) Thermodynamics and energy balances
Engr 219, Macro and Micro Economies
Engr 221, Thermodynamics

7) Introduction to engineering
Several courses are offered to introduce freshmen to the various fields of engineering. Some of these courses, which are numbered consecutively with Engr 110, may not be included in this Announcement. A full listing will be available at the time of registration.

Humanities and Social Sciences
The six required courses in the humanities and social sciences must be chosen from approved courses in three categories: (a) humanities or history, (b) social sciences, and (c) expressive or language arts.

The contents of these categories are listed below. At least three courses must be chosen from category (a), and no more than one course may be chosen from category (c).

a) Humanities or History
This category includes all courses designated by the College of Arts and Sciences as fulfilling its distribution requirements in humanities and history (see pp. 95-96) 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 cinema courses except 377 and 477.

b) Social Sciences
This category includes all courses designated by the College of Arts and Sciences as fulfilling its distribution requirements in social sciences (see p. 95) as well as the following:

College of Agriculture and Life Sciences: Agricultural Economics 150, 250, 332; Communication Arts 200, 215, 302, 303, 404; Education 110, 271, 317; Natural Resources 201, 407; Rural Sociology, all courses.

College of Architecture, Art, and Planning: Architecture 181, 182, 544; City and Regional Planning 340, 400, 402, 403, 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, 335; 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 designated by the College of Arts and Sciences as fulfilling its distribution requirements in expressive arts (see p. 96) 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 individual students, while maintaining a coordinated, nontivial program. Free electives may be any course in the University, although all course selections must be approved by the student's faculty advisor. 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.

The Office of Undergraduate Affairs
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 Undergraduate Affairs, which implements the academic policies of the Common Curriculum Governing Board. Regular students may affiliate with a field after one full year of study, and must do so no later than the end of the second full year of study. Transfer students must affiliate with a field of study when they matriculate.

Engineering courses taken at the freshman and sophomore levels are listed under Engineering Common Courses.

Following is a typical curriculum for freshmen. Many variations are possible, depending on the individual student's background, advanced placement credit, and career goals. Those acquainted with the calculus may substitute Math 191 or 193 for Calc 1 and 2. Students intending to enter the Field Program in Chemical Engineering may substitute Math 112 in term one for an approved elective. Students with an interest in bioengineering may take Biotechnology in terms one and two as approved electives.

Term 1
Math 191 or 193, Calculus for Engineers

Chem 207, General Chemistry

Engr 105, Introduction to Computer Programming; or Phys 112, Mechanics and Heat

Introduction to Engineering, or an approved elective

Free elective

Freshman Seminar

Term 2
Math 192, Calculus for Engineers

Phys 112, Mechanics and Heat; or Phys 213, Electricity and Magnetism

Approved elective or Engr 165

Introduction to Computer Programming

Engineering distribution course, humanities and social sciences course, or approved elective

Free elective

Free elective

Field Program
The specific program for each field is described in the following pages. Students with a grade-point average of at least 2.0 who are making normal progress toward their degree may choose to enroll in a field program at the beginning, middle, or end of their sophomore year. Some fields require a specific engineering distribution course as a prerequisite for the upperclass course sequence. These requirements are:

Chemical Engineering: Engr 219

Civil and Environmental Engineering: Engr 202

Computer Science: Engr 219

Electrical Engineering: Engr 210

Engineering Physics: Engr 221

Materials Science and Engineering: Engr 261

Mechanical and Aerospace Engineering: Engr 202

Operations Research and Industrial Engineering: Engr 260

College Program
Individually arranged courses of study under the College Program are possible for those whose educational objectives cannot be met by one of the regular field programs. Often the desired curriculum is in an interdisciplinary area. Each program is developed by the student in consultation with faculty advisors and must be approved by the College Program Committee, which is responsible for supervising the student's work.

Students apply to enter the College Program early in the second term of the sophomore year. A student may receive assistance in developing a coherent program from professors in the proposed major and minor subject areas. If approved, the program is the curricular contract to which the student must adhere.
Every curriculum in the College Program, with the exception of certain faculty-sponsored programs, must comprise an engineering major and a minor. The major may be in any subject area offered by schools or departments of the college; the minor may be in a second engineering subject area or in a logically connected nonengineering area. The combinations must clearly form an engineering education in scope and in substance and should include engineering design and synthesis as well as engineering sciences. In addition to fourteen courses in the major and minor subjects, including at least seven engineering courses, each program includes humanities and social sciences electives and free electives.

Further information about the College Program may be obtained from the Office of Undergraduate Affairs, 167 Olin Hall.

Dual Degree Option
A special academic option, intended for superior students, is the dual degree program, in which both Bachelor of Science and Bachelor of Arts degrees can be earned in five years. Students registered in either the College of Engineering or the College of Arts and Sciences may apply and, after acceptance of their application, begin the dual program in their second or third year. Those interested should contact the Office of Undergraduate Affairs, 167 Olin Hall.

Engineering Cooperative Program
A special program for undergraduates in most fields of engineering is the Engineering Cooperative Program, which provides an opportunity to supplement course work with carefully monitored, paid jobs in industry and other engineering-related enterprises. Sophomores in the upper half of their class are eligible to apply for the program; students from foreign countries must have visas that allow them to work in the United States.

Prospective co-op students 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 to complete 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 classmates.

Further information may be obtained from the Engineering Cooperative Program office, 105 Hollister Hall.

Advanced Placement Credit
A growing number of freshmen entering the College of Engineering are eligible to receive advanced placement (AP) credit toward degree requirements, in recognition of demonstrated academic proficiency. Students may qualify for AP credit in one of two ways:

1) by receiving sufficiently high scores on advanced placement examinations given and scored by the College Entrance Examination Board (CEEB); or

2) by receiving sufficiently high scores on Cornell's departmental placement examinations, which are given during the orientation week before fall-term classes begin. Advanced placement is granted only to first-term freshmen, and the placement examinations are scored before the students begin classes.

Advanced placement credit is intended to permit students to develop more challenging and stimulating programs of study. Two ways in which freshmen may use such credit are detailed below.

1) AP credit can be used to fulfill basic requirements, thus permitting advanced study in the same subject area or enrollment in additional nontechnical elective courses.

2) In a few cases, students may receive enough AP credit to complete the B.S. degree requirements ahead of time.

The college's policies concerning 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 Undergraduate Affairs, 167 Olin Hall.

Transfer credit
Entering freshmen and entering transfer students who have completed courses at recognized and accredited colleges may, under certain conditions, have credits for such courses transferred to Cornell. Such courses must represent academic work in excess of that required for the secondary school diploma.

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 must be determined academically by the dean of the college. In 1982-83 a term average of 3.25 or higher was required, with no failing, unsatisfactory, or incomplete grades.

Dean's List citations are presented each semester to those engineering students with exemplary academic records. The criteria for this honor are determined by the dean of the college.

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) field engineering. Engineering electives are chosen from among subject areas relevant to agricultural engineering, such as thermal engineering, mechanical design and analysis, theoretical and applied mechanics, structural engineering, hydraulics, environmental engineering, soil engineering, waste management, and electronics.

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 Credits
Math 191, 192, 293, 294, Calculus 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, Thermodynamics, Computers and Programming) 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 above Ag En 450) for a minimum of 12 credits, excluding seminar or special-problems courses 33
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 students' fundamental knowledge of engineering and develop their design skills. Six of the required 30 credits are earned for an engineering design project that culminates in a professional-level report.


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 both stresses the fundamentals of science and engineering, and gives the student direct exposure to the application of these fundamentals. Laboratory experimentation is emphasized, and ample opportunity for innovative design is provided. Examples are A&EP 110, The Laser and Its Applications in Science, Technology, and Medicine (a freshman course); A&EP 264, Computed-aided Instrumentation Design (a sophomore course); A&EP 363, Electronic Circuits (a junior course); and Physics 410, Advanced Experimental Physics (a senior course).

Undergraduates who plan to enter the Field Program in Engineering Physics are advised to arrange their Common Curriculum with certain requirements and recommendations in mind. They are encouraged to take Physics 112 during their first semester, and they are required to take Engr 221, Thermodynamics, as an engineering applications course. Students are encouraged to satisfy the requirement for a course in computing applications with another engineering distribution course, in the area of scientific computing. Engineering students need to take only three engineering distribution courses, as A&EP 333, which they take in their junior year, counts as a fourth member of this category.

Students who wish to receive the Bachelor of Science degree must satisfy the requirements of the field program, outlined below, as well as the requirements of the Common Curriculum.

### Course Credits
- A&EP 333, Mechanics of Particles and Solid Bodies 4
- A&EP 355, Intermediate Electromagnetism 4
- A&EP 361, Introductory Quantum Mechanics 4
- A&EP 463, Electronic Circuits 4
- A&EP 423, Statistical Thermodynamics 4
- A&EP 434, Continuum Physics 4
- Physics 410, Advanced Experimental Physics 4
- Mathematics 421 or T&AM 610 (applied mathematics) 4
- Mathematics 422 or T&AM 611 (applied mathematics) 4
- Applications of Quantum mechanics* 3 or 4
- A third technical elective (in addition to the two required by the Common Curriculum) 3

*Courses that will satisfy this requirement are
- Physics 444, Nuclear and High-Energy Particle Physics; Physics 454, Introductory Solid-State Physics; A&EP 609, Low-Energy Nuclear Physics; and EE 531, Quantum Electronics I.

If a scientific computing course was not selected as an engineering distribution course, one of these technical electives may be used to satisfy the computing application requirement.

Considerable flexibility is possible in scheduling. For example, Physics 410 may be taken in term seven or in term eight. Quantum mechanics can be studied in term six as A&EP 361 or in term seven as Physics 444. The courses in applications of quantum mechanics can be taken whenever the appropriate prerequisite has been met. If scheduling conflicts arise, the school may allow substitutions of courses nearly equivalent to the listed required courses.

Physics 325-326 is similar to A&EP 355-356; Physics 318 (offered in the spring) and T&AM 570 are similar to A&EP 333; and a number of advanced courses in fluid mechanics or elasticity are similar to A&EP 434.

Free and technical electives need not be 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, quantum electronics, solid-state and surface 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 preparation in the area of technical interest. The minimum requirement is two courses or six credits.

The engineering physics student is expected to pass every course for which he or she is registered, to earn a grade of C or better in specific required courses, and to attain each term an overall grade-point average of at least 2.3.

### Areas of concentration

With a total of five electives in the junior and senior years, students can tailor the upperclass program to develop areas of concentration in accordance with their individual interests. For those who look toward an industrial position after graduation, these electives can be chosen to provide a 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 to provide a basis for medical, law, or business school. For students who plan on graduate work, the electives provide an excellent opportunity to explore upper-level and graduate 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 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; 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 granted the degree will have demonstrated competence in a specific area of applied physics; if this has not been accomplished at the undergraduate level, subjects such as electricity and magnetism, or classical, quantum, and statistical mechanics should be included in the program.

The general requirement for the degree is a total of 30 credits for graduate-level courses 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, mechanical engineering, 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 comprises a coordinated sequence of courses beginning in the sophomore year and extending through the fourth year. Special programs in biological engineering and polymeric materials are available. Students who plan to enter the field program take Chemistry 208 as an approved elective during the freshman year. The program for the last three years, for students who have taken two engineering distribution courses during the first year, is as follows:

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Math 293</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Engineering Mathematics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Phys 213</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Chem 287-289</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Physical Chemistry</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>(approved elective)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Chem E 219</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(engineering distribution course)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities or social sciences elective</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Math 294</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Engineering Mathematics</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Phys 214</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Optics, Waves, and Particles</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Chem 288-290</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Physical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Engineering distribution course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities or social sciences elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Term 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chem 357</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Chem 251</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Organic Chemistry Laboratory</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Chem E 311</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Chem E 430</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Introduction to Rate Processes</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective*</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities or social sciences elective</td>
<td>3</td>
</tr>
</tbody>
</table>
Bachelor of Science Curriculum
The School of Civil and Environmental Engineering contains two departments as well as the Program in Environmental Sensing, Measurement, and Evaluation. Undergraduate specialties can be arranged in a number of subject areas encompassed by these units. 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 five subject areas: environmental quality engineering; fluid mechanics and hydrology; public systems and environmental systems engineering; 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.

For the Field Program in Civil and Environmental Engineering the following courses are required in addition to those required for the Common Curriculum:

- **Courses**
  - Engr 202, Mechanics of Solids* 3
  - Engr 203, Dynamics* 3
  - Engr 261, Introduction to Mechanical Properties of Materials* 3
- **CEE 301, Numerical Solutions to Civil Engineering Problems** 4
- **CEE 323, Engineering Economics and Systems Analysis** 3
- **CEE 332, Fluid Mechanics I** 4
- **CEE 341, Introductory Soil Mechanics** 3
- **CEE 351, Environmental Quality Engineering** 3
- **CEE 361, Introduction to Transportation Engineering** 3
- **CEE 371, Structural Behavior** 4
- Distribution courses (four courses selected from four of the seven different subject areas of CEE) 12
- Technical elective 3

*The electives in terms five through eight comprise 6 credits of technical electives and 6 credits of free electives. In addition, for students of the class of 1984, the electives include 3 credits of the postponed engineering core science course (as described in the 1981-82 Courses of Study).

The requirement for a liberal studies elective for the class of 1984 has become a requirement for a humanities or social sciences elective for the class of 1985 and later.

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:

<table>
<thead>
<tr>
<th>Year</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CEE 563, Process Equipment Design and Selection</td>
<td>3</td>
</tr>
<tr>
<td>Spring</td>
<td>CEE 564, Design of Chemical Reactors and Multiphase Systems</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CEE 671, Process Control</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CEE 675, Design Project</td>
<td>3 or 6</td>
</tr>
</tbody>
</table>

Technical electives 3 or 6

Civil and Environmental Engineering
School of Civil and Environmental Engineering: R. N. White, director; J. J. Bisogni, associate director

Liu, R. C. Loehr, D. P. Loucks, W. R. Lyon, N. Orlott, R. E. Schuler, C. Shoemaker, J. R. Steding, M. A. Turnquist

Program in Environmental Sensing, Measurement, and Evaluation: T. L. Liang, B. G. Lyon, W. R. Philipson

Bachelor of Science Curriculum
The Field Program in Computer Science is intended for students who are interested in the computing process and in the fundamental structure of algorithms, data, and languages that underlies 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, CS 280, and a fourth-term mathematics course approved in the Common Curriculum 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. Apart from these requisites and those of the college, the courses required for the Field Program in Computer Science are:

- **Course work**
  - Systems sequence 8
  - Theory sequence 8
  - Numerical Analysis 4
  - Electrical Engineering 3
  - Computer science electives 7 or 8

Any nonrequired computer science courses numbered above 410 Related electives 12

One mathematically oriented course plus three courses forming a coherent sequence in operations research, electrical engineering, or another technical area.

*The courses CS 321 and EE 230 satisfy the college requirement for technical electives.

Master of Engineering (Computer Science) Degree Program
A recent addition to the academic offerings in computer science is the one-year program leading to the degree of M.Eng.(Computer Science). The program is very small; from two to five students...
A brochure describing the field program and concentrations in detail may be obtained from the School of Electrical Engineering, Phillips Hall.

**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-semester 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**

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 requirements, the electrical engineering Bachelor of Science curriculum requirements are as follows:

<table>
<thead>
<tr>
<th>Course Description</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 316, 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 intending to specialize in geophysics should select their required sciences from the following courses or their equivalents:

- Math 421-422-423, Applicable Mathematics
- T&M 310-311, Advanced Engineering Analysis I and II
- A&E 355, Intermediate Electromagnetism
- A&E 333, Mechanics of Particles and Solid Bodies
- A&E 356, Intermediate Electrodynamics
- A&E 434, Continuum Physics
- Phys 410, Advanced Experimental Physics
- T&M 450, Introduction to Continuum Mechanics

Students intending to specialize in geochemistry (including petrology and mineralogy) should select their required sciences from the following courses or their equivalents:

- Chem 267-268, 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, Introductory 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

Students intending to specialize in geology should select their required sciences from the following courses or their equivalents:

- Bio S 212, Invertebrate Zoology
- Bio S 330-331, Principles of Biochemistry
- Bio S 241, Plant Biology
- Bio S 448, Plant Evolution and the Fossil Record
- Bio S 360, General Ecology
- Bio S 274, The Vertebrates
- Bio S 477, Organic Evolution
- Bio S 281, Genetics
- Chem 253, Elementary Organic Chemistry

Students who want to pursue further training or immediate employment in applied geology (environmental and engineering geology, groundwater, petroleum geology, or geological engineering) should select their required sciences 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 771, Soil Chemistry
- Agron 607, Soil Physics
- CEE 341, Introductory Soil Mechanics
- CEE 640, Foundation Engineering
- CEE 612, Physical Environment Evaluation
- 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
- Math 421-422-423, Applicable Mathematics
- ORIE 260, Introductory Engineering Probability
- ORIE 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. These should reflect their speciality of economics or for more advanced graduate study in other areas.

Students who want a more general background or who want to remain uncommitted with regard to specialty must choose at least two of the following advanced courses:

- Math 421-422-423, Applicable Mathematics
- T&M 310-311, Advanced Engineering Analysis
- A&E 355, Intermediate Electromagnetism
- A&E 333, Mechanics of Particles and Solid Bodies
- A&E 356, Intermediate Electrodynamics
- A&E 434, Continuum Physics
- Phys 410, Advanced Experimental Physics
- T&M 450, Introduction to Continuum Mechanics

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 following languages: French, German, or Russian. Undergraduate preparation in at least one of these languages is therefore advantageous.

**Materials Science and Engineering**

### Bachelor of Science Curriculum

Students who major in materials science and engineering are required to take Engr 261: Introduction to Mechanical Properties of Materials, before the end of their junior year. They are strongly urged to take it as an engineering distribution course during their freshman or sophomore year. Students who choose to major in materials science and engineering can concentrate in any one of the following areas of specialization: materials science, solid state, metallurgy, ceramic materials, polymeric materials, or electrical materials. Specialization is achieved through the selection of free and technical electives in the junior and senior years. In addition to the courses needed to satisfy the requirements of the Common Curriculum, the materials science and engineering field program leading to the Bachelor of Science degree consists of:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS&amp;E 331, Structure and Properties of Materials</td>
<td>4</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 332, Electrical and Magnetic Properties of Materials</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>
<tr>
<td>MS&amp;E 445, Mechanical Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 442, Macroprocessing of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 444, Senior Materials Laboratory II</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 446, Current Topics in Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

*The research-involvement option 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.

### 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. The major areas of concentration, corresponding to the two major streams of mechanical engineering technology, are offered in the field program:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;AM 202, and Engr 221 (also M&amp;AE 221) as either an approved or free elective. All these courses and techniques modify the human environment.</td>
<td></td>
</tr>
<tr>
<td>The requirements listed are those now in effect for the class of 1985 and beyond and are subject to change by the faculty of the school. Requirements for earlier classes differ somewhat from the ones listed.</td>
<td></td>
</tr>
<tr>
<td>The requirements listed are those now in effect for the class of 1985 and beyond and are subject to change by the faculty of the school. Requirements for earlier classes differ somewhat from the ones listed.</td>
<td></td>
</tr>
</tbody>
</table>

### 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 sciences are eligible for consideration for admission. Students who have completed a four-year undergraduate program in engineering or the physical sciences. Other subjects recommended as 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 technology, are offered in the field program.

### Mechanical and Aerospace Engineering

- Members of the faculty of the graduate Fields of Aerospace Engineering and Mechanical Engineering are listed in the Announcement of the Graduate School.

### 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 technology, are offered in the field program.

### Mechanical Engineering

- The research-involvement option 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.

### 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 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.

### 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 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:

<table>
<thead>
<tr>
<th>Core courses available</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M&amp;AE 506, Aerospace Propulsion Systems</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 507, Dynamics of Flight Vehicles</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 530, Fluid Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 531, Rocket Propulsion</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 536, Turbomachinery and Applications</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 543, Combustion Processes</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;AE 559, Introduction to Controlled Fusion</td>
<td>3</td>
</tr>
</tbody>
</table>
The school has particular strengths in the areas of the Master of Engineering Committee of the Sibley aerodynamic noise, sonic boom, nonlinear waves, including the project, are required. 515-516 or the equivalent), participation in the Also required are 6 credits of technical electives. A M&AE 704, Theory of Viscous Flows 4 close supervision of a faculty member. mechanical engineering design focus and have the design project. Such a project must-have a statement of overall objectives and a statement of the subsequent changes must also be approved by this committee. The suggested curriculum for the College Program in Nuclear Science and Engineering includes NS&E 303, 304, 305, Introduction to Nuclear Science and Engineering I, II, and III, plus two of the four courses A&E 612, 651, 653, and 633. Also available is the College Program in Energy Conversion, a synthesis of nuclear, thermal, and electrical engineering. See the introductory section under College of Engineering for a general description of the College Program.

Master of Engineering (Nuclear) Degree Program

The two-term curriculum leading the M.Eng (Nuclear) degree is intended primarily for individuals who want a terminal professional degree, but it may also serve as preparation for doctoral study in nuclear science and engineering. The course of study covers the basic principles of nuclear reactor systems with a major emphasis on reactor safety and radiation protection and control. The special facilities of the Ward Laboratory of Nuclear Engineering are described in the Announcement of the Graduate School.

The interdisciplinary nature of nuclear engineering allows students to enter from a variety of undergraduate specializations. The 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 should see that they fulfill these requirements before beginning the program. In some cases, deficiencies in preparatory work may be made up by informal study during the preceding summer. General admission and degree requirements are described in the college's introductory section.

The following courses are included in the 30-credit program:

Fall term
A&E 612, Nuclear Reactor Theory I
A&E 633, Nuclear Engineering
A&E 609, Low-Energy Nuclear Physics
Technical elective

Spring term
A&E 651, Nuclear Measurements Laboratory
Technical elective

Engineering design project
Mathematics or physics elective

Engineering electives should be in a subject area relevant to nuclear engineering, such as energy conversion, radiation protection and control, feedback control systems, magnetohydrodynamics, controlled thermonuclear fusion, and environmental engineering.

The list below gives typical electives:

M&AE 651, Transport Processes II
EE 581, Introduction to Plasma Physics
EE 582, Advanced Plasma Physics
EE 571, Feedback Control Systems
EE 572, Digital Control Systems
A&E 613, Nuclear Reactor Theory II
A&E 652, Advanced Nuclear and Reactor Laboratory
A&E 636, Seminar on Thermonuclear Fusion Reactors
A&E 638, Intense Pulsed Electron and Ion Beams: Physics and Technology
MS&E 705, The Effects of Radiation on Materials

Bachelor of Science Curriculum

The program is designed to provide a broad and basic education in the techniques and modeling concepts needed to analyze and design complex systems and to provide an introduction to the technical and professional areas with which operations researchers and industrial engineers are concerned.

A student who plans to enter the Field Program in Operations Research and Industrial Engineering should take Introductory Engineering Probability (Engr 260). For a student who has not taken Engr 260, entry into the field program in OR&IE is possible only by permission of the associate director. In addition, it is recommended that Computers and Programming (CS 211 or Engr 211) be taken before entry into the OR&IE field program. Early consultation with an OR&IE faculty member or with the associate director can be helpful in making appropriate choices. The required courses for the OR&IE field program and the typical terms in which they are taken are as follows.

Bachelor of Science in Engineering

Operations Research and Industrial Engineering

The basic senior-year program, from which liberal studies elective 3

OR&IE 370, Introduction to Statistical Theory with Engineering Applications 4

OR&IE 320, Optimization I 4

Applied probability and statistics: OR&IE 462, 471, 472, 561, 563, and 570

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 various operating organizations such as manufacturing firms, retailing organizations, service organizations, government agencies, and educational institutions.

Cooperative Program with Business and Public Administration

Undergraduates majoring in operations research and industrial engineering may be interested in a cooperative program at Cornell that leads to both Master of Engineering and Master of Business Administration (M.B.A.) degrees. With appropriate curriculum planning such a combined B.S.-M.Eng.-M.B.A. program can be completed in six years.

An advantage for OR&IE majors is that they study, as part of their undergraduate curriculum, several subjects that are required for the M.B.A. degree. (This is because modern management is concerned with the operation of production and service systems, and much of the analytical methodology required to deal with operating decisions is the same as that used by systems engineers in designing the systems.) Getting started early on meeting the business-degree requirements permits students accepted into the cooperative program to earn both the M.Eng.(OR&IE) and M.B.A. degrees in two years rather than the three years such a program would normally take.

Essential aspects of the program as it pertains to the M.B.A. degree are:

1) By the end of the fifth year, the candidate completes—through course work, advanced standing, or exemption examinations—the core course work required for the M.B.A. degree, except for B&P&NB 503, Business Policy.

2) A maximum of 30 credits toward the M.B.A. degree can be earned for courses taken before the start of the sixth year; these credits may be earned in the undergraduate B.S. program, in the M.Eng. program, or in the Graduate School of Business and Public Administration.

3) During the sixth year, over a period of two semesters, the candidate earns 26 credits in elective courses approved by the business school, plus 4 credits for B&P&NB 503, Business Policy.

In accordance with this plan the candidate would qualify for the B.S. degree at the end of four years, the M.Eng.(OR&IE) degree at the end of five years, and the M.B.A. degree at the end of six years.

Further details and application forms may be obtained at the office of the School of Operations Research and Industrial Engineering, Upson Hall.

Theoretical and Applied Mechanics

Undergraduate Study

The Department of Theoretical and Applied Mechanics is responsible for courses in engineering mechanics and engineering mathematics, some of which are part of the Common Curriculum.

College Program in Engineering Science

A student may enroll in the College Program in Engineering Science, which is sponsored by the Department of Theoretical and Applied Mechanics. The College Program is described in the section on undergraduate study in the College of Engineering.

Engineering Courses

Courses offered in the College of Engineering are listed under the various departments and schools.

Courses are identified with a standard abbreviation followed by a three-digit number.

Engineering Common Courses

- Engr
- AgEn
- A&EP
- ChemE
- CEE
- CS
- EE
- Geol
- M&AE
- Materials Science and Engineering
- M&E
- Mechanical and Aerospace Engineering
- NS&E
- Operations Research and Industrial Engineering
- OR&IE
- Theoretical and Applied Mechanics
- T&AM

Engineering Common Courses

240 Drawing and Engineering Design (also M&AE 102) Fall, spring. 1 credit. Half-term course offered twice each semester. Recommended for students without previous mechanical drawing experience. S-U grades optional. Enrollment limited. 2 lecs, 1 lab.
Basic concepts of microprocessor organization and programming languages are developed in conjunction with microprocessor control of input and output devices. These ideas are used to develop applications of the microprocessor to engineering, scientific, and commercial problems. Each student has access to a microprocessor system in the laboratory and will develop and test programs on this system. Selected engineering problems will be solved in the laboratory using the microprocessor systems.

116 Modern Structures: Behavior, Design, and Construction (also CEE 116) Spring. 3 credits.

Two lecs, 1 lab. A. R. Ingraffea, F. H. Kulhawy, W. McGuire. A major structure, such as a skyscraper or a bridge, participates in a highly complex system together with its foundation and the rock or soil on which it is built. Its construction must honor financial constraints; it must function properly; and it must be safe for its users. The course will focus on how typical structural systems behave under different loadings (self-weight, wind, traffic, snow, earthquake, thermal stress, etc.); how they are designed; how materials are selected; and how construction and operational issues are addressed in the design and construction of structures. Lectures and laboratory sessions will deal with the elements of structure and foundation analysis, the principal construction materials (steel, concrete, soil, and rock) used in civil engineering, and construction methods. Computer graphics (at CADIF) will be utilized for structural analysis.

117 Introduction to Mechanical Engineering (also MASE 117) Fall, spring. 3 credits. Consists of two half-term minicourses chosen from a list of three. Two of these minicourses alternate; the third (Drawing and Engineering Design) is offered every half term but has limited enrollment.

Two lecs, 1 lab. Drawing and Engineering Design (see Engr 102) will enable students without prior mechanical drawing experience to become familiar with the basic techniques of engineering graphics. The other two minicourses provide an introduction to topics of current interest typifying two broad areas within mechanical engineering: energy conversion, and mechanical design and manufacturing.

118 Introductory Geological Sciences (also Geol 101) Fall, spring, 3 credits.

Two lecs, 1 lab, field trips. W. B. Travers, fall; A. L. Bloom, spring.

Understanding the natural earth: weathering, erosion, the evolution of coastlines and river valleys, the generation of volcanoes, and the drifting of continents. Studies of groundwater, mineral deposits, and the genesis of mineral deposits. Recognition of major minerals and rocks, interpreting topographic and geological maps.

119 Introduction to Manufacturing Engineering (also MASE 119 and OR&IE 119) Spring. 3 credits.

Two lecs, 1 lab. Engineering considerations in the design, manufacturing, distribution, and service of products. Transformation from functional requirements to material and processing specifications. Engineering problems in the design and management of a manufacturing facility and distribution channels. Visits will be made to local industries.

120 Problem Solving and Modelling (also OR&IE 120) Spring. 3 credits. Not offered 1986-87.

Two lecs, 1 lab. W. F. Lucas.

A general overview of the fields of systems analysis, operations research, policy science, and decision making, with selected applications from engineering and interdisciplinary areas. The nature of mathematical modeling and patterns of problem solving will be stressed. Operations research, scheduling, logistics, control, equity analysis, and conflict resolution will be covered. Ways of taking into account measurement and uncertainty and decision-making, multiple objectives, and the society will be discussed. Contemporary problems, recent discoveries, and newer subject areas will be treated.

121 Fusion, Fission, and Radiation (also NSAE 121) Fall, spring. 3 credits.

Two lecs, 1 lab demonstration. A lecture, demonstration, and laboratory course on: (1) the physical nature and biological effects of nuclear radiation; (2) the benefits and hazards of nuclear energy; (3) light-water reactors, breeder reactors, and fusion reactors; and (4) the uses of nuclear radiation in physical and biological research. The laboratory work and demonstrations involve criticality and the control of Cornell's two research reactors, detection of and protection against nuclear radiation, neutron activation analysis using gammaray spectroscopy, and plasma sources and devices.

122 Composite Materials: Design and Applications (also MS&E 122) Fall. 3 credits.

Composite materials are combinations of materials arranged to produce new, superior materials. Wood and bone are natural composites, because of their lightness and strength; coke-oven graphite, carbon-fiber composites, are produced 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.

202 Mechanics of Solids Fall, spring. 3 credits. Prerequisite: coregistration in Mathematics 293.

Two lecs, 1 rec, 4 labs each semester; evening exams. Principles of statics, force systems, and equilibrium; frameworks; mechanics of deformable solids, stress, strain, statically indeterminate problems; mechanical properties of engineering materials; axial force, shearing force, bending moment; stress-tensor notation; 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.

Two lecs, 1 rec, 4 labs each semester; evening exams. Newtonian dynamics of a particle, systems of particles, and a rigid body. Kinematics, motion relative to a moving frame. Impulse, momentum, angular momentum, energy. Rigid-body kinematics, angular velocity, moment of momentum, and the inertia tensor. Euler equations, the gyroscope.

210 Introduction to Electrical Systems (also Engr 210) Fall. 3 credits. Prerequisites or corequisites: Mathematics 293 or Physics 213.

Three lecs and optional tutorial sections. Circuit elements and laws, analysis techniques, operational amplifiers. Response of linear systems, with emphasis on use of computer-aided analysis. 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.

114 Introduction to Microprocessors (also EE 114) Fall, spring. 3 credits.

Two lecs, 1 lab. A. R. Ingraffea, F. H. Kulhawy, W. McGuire. A major structure, such as a skyscraper or a bridge, participates in a highly complex system together with its foundation and the rock or soil on which it is built. Its construction must honor financial constraints; it must function properly; and it must be safe for its users. The course will focus on how typical structural systems behave under different loadings (self-weight, wind, traffic, snow, earthquake, thermal stress, etc.); how they are designed; how materials are selected; and how construction and operational issues are addressed in the design and construction of structures. Computer graphics (at CADIF) will be utilized for structural analysis.

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Two lecs, 1 lab. W. F. Lucas.

A general overview of the fields of systems analysis, operations research, policy science, and decision making, with selected applications from engineering and interdisciplinary areas. The nature of mathematical modeling and patterns of problem solving will be stressed. Operations research, scheduling, logistics, control, equity analysis, and conflict resolution will be covered. Ways of taking into account measurement and uncertainty and decision-making, multiple objectives, and the society will be discussed. Contemporary problems, recent discoveries, and newer subject areas will be treated.

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Two lecs, 1 lab demonstration. A lecture, demonstration, and laboratory course on: (1) the physical nature and biological effects of nuclear radiation; (2) the benefits and hazards of nuclear energy; (3) light-water reactors, breeder reactors, and fusion reactors; and (4) the uses of nuclear radiation in physical and biological research. The laboratory work and demonstrations involve criticality and the control of Cornell's two research reactors, detection of and protection against nuclear radiation, neutron activation analysis using gammaray spectroscopy, and plasma sources and devices.

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202 Mechanics of Solids Fall, spring. 3 credits. Prerequisite: coregistration in Mathematics 293.

Two lecs, 1 rec, 4 labs each semester; evening exams. Principles of statics, force systems, and equilibrium; frameworks; mechanics of deformable solids, stress, strain, statically indeterminate problems; mechanical properties of engineering materials; axial force, shearing force, bending moment; stress-tensor notation; 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.

Two lecs, 1 rec, 4 labs each semester; evening exams. Newtonian dynamics of a particle, systems of particles, and a rigid body. Kinematics, motion relative to a moving frame. Impulse, momentum, angular momentum, energy. Rigid-body kinematics, angular velocity, moment of momentum, and the inertia tensor. Euler equations, the gyroscope.

210 Introduction to Electrical Systems (also Engr 210) Fall. 3 credits. Prerequisites or corequisites: Mathematics 293 or Physics 213.

Three lecs and optional tutorial sections. Circuit elements and laws, analysis techniques, operational amplifiers. Response of linear systems, with emphasis on use of computer-aided analysis. 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.
program development, invariant relations, block structure, recursion, and introduction to data structures and analysis of algorithms. PL/I is the principal programming language used.

219 or 220  Mass and Energy Balances (also Chem E 219, 220) 219, Fall, 220, Summer. 3 credits. Prerequisite: one year of freshman chemistry. 219 is recommended for students planning to enter the Field Program in Chemical Engineering. R. G. Thorpe. Engineering problems involving material and energy balances. Batch and continuous reactive systems in the steady and unsteady states. Humidification processes. Chem E 220 differs from 219 in that it uses only self-paced audiovisual instruction at the convenience of the student. A minimum of 70 clock hours of audiovisual instruction is required to master the subject matter. Student performance in 220 is evaluated by nine tests, two preliminary examinations, and a final examination. Superior students may earn exemption from the final examination.

221 Thermodynamics  Fall, Spring. 3 credits. Prerequisites: Mathematics 191-192 and Physics 112.

3 lecs. The definitions, concepts, and laws of thermodynamics. Applications to ideal and real gases, multi-component systems, gases in flames, heat-engine and heat-pump cycles, with an introduction to energy-conversion systems.

260 Introductory Engineering Probability (also OR&IE 260) Fall, Spring. 3 credits. Prerequisite: first-year calculus.

3 lecs. The basic tools of probability and their use in engineering. 260 may be the last course in probability for some students, or it may be followed by OR&IE 361, Introductory Engineering, Stochastic Processes I, or OR&IE 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.

265 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.

262 Introduction to Electrical Properties of Materials  Spring. 3 credits.

2 lecs, 1 rec or lab. Electrical and structural properties of semiconductors, oxide layers, and metal films that are used in modern integrated circuits. Crystal structure, growth of semiconductors, deposition of thin films, electrical conduction, p-n junctions, transistors, and light-emitting diodes. Interplay between structural and electrical properties and their application to the design of semiconductor devices and integrated circuits.

270 Basic Engineering Probability and Statistics  Fall, Spring. 3 credits. Students who intend to enter the upperclass Field Program in Operations Research and Industrial Engineering should take Engr 260 instead of this course. Prerequisite: first-year calculus.

3 lecs. At the end of this course a student should command a working knowledge of basic probability and statistics as they apply to engineering work. For students who want to have greater depth in probability and statistics, a course in probability (OR&IE 260) followed by a course in statistics (OR&IE 370) is recommended.

321 Numerical Methods (also CS 321) Fall. 4 credits. Prerequisites: Mathematics 293 or 221 and knowledge of FORTRAN equivalent to that taught in CS 100.


Agricultural Engineering

Courses in agricultural engineering will be found in the section listing the offerings of the College of Agriculture and Life Sciences.

Applied and Engineering Physics

110 The Laser and its Applications in Science, Technology, and Medicine (also Engr 110)  Fall, Spring. 3 credits. This is a course in the Introduction to Engineering series.

2 lecs, 1 lab. T. A. Cool, A. Lewis. For description see Engineering Common Courses.

206 Introduction to Biophysics  Fall. 3 credits. Prerequisite: concurrent registration in Physics 213 or permission of instructor.

3 lecs, A. Lewis. A systematic introduction to the quantitative study of biological systems. Intended for science students and engineers who want to see how biological systems exemplify the ultimate in design. Topics, chosen to show the interdependence of all living matter, are photosynthetic energy conversion, O2 and starch (focusing on the relation of hemoglobin and metabolism to membranes), perception, replication, and the connection between biophysics and genetic engineering.

217 The Physics of Energy  Spring. 3 credits. Prerequisite: Physics 213 or permission of instructor.

2 lecs, 1 rec-lab T. N. Rhodin. An introduction to the production, conversion, and control of energy. Nuclear reactions, plasma properties, and solid-state electronics are related to the design and development of large-scale energy sources. Basic physical concepts are related to specific applications in practical systems. Students gain laboratory experience in activation analysis, plasma diagnostics, and photovoltaic cell characterization. At the level of Foundations of Nuclear Energy, by Connolly, or An Introduction to Physics, by Ramo.

264 Computerized-Instrumentation Design Fall, Spring. 3 credits.

1 lec, 1 lab, 1 E. Luckes. This laboratory course teaches design techniques for incorporating small computers into experimental apparatus. Experiments in elementary physics are performed with appropriate sensors wired to computer interfaces. Experiments are done under program control using routines written in BASIC and ASSEMBLY languages. Experiments use analog-to-digital converters, digital-to-analog converters, optical encoders, and stepping motors. Graphic display of data and theoretical fit are emphasized.

303 Introduction to Nuclear Science and Engineering I (also A&EP 303) Fall. 3 credits. Prerequisite: Physics 214 or Mathematics 294. This course and A&EP 304 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. D. D. Clark. 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 NS&E 340) Spring. 3 credits. Prerequisite: A&EP 303.

3 lecs. D. D. Clark. Introduction to aspects of nuclear reactor engineering and to controlled fusion. Topics include heat-transfer and safety problems in fission reactors; principles, configurations, and engineering problems of proposed fusion reactors, reactor detectors, shielding, biological effects of radiation, and materials damage.

333 Mechanics of Particles and Solid Bodies  Fall. 4 credits.

3 lecs, 1 rec. J. Silcox. Newton's laws: coordinate transformations; generalized coordinates and momenta. Lagrangian and Hamiltonian formulation; application to oscillators: restrained motion, central forces, small vibrations of multiparticle systems, motion of rigid body.

355 Intermediate Electromagnetism Fall. 4 credits. Prerequisites: Physics 214 and coregistration in Mathematics 421 or T&M 610, or permission of instructor.

3 lecs, 1 rec. H. H. Fleischmann. Topics: vector calculus, electrostatics, magnetostatics, and induction phenomena; solutions to Laplace's equation in various geometries, electric and magnetic materials, electric and magnetic forces, energy storage, skin effect, quasistatics. Emphasis on physical concepts and applications to design of high-voltage generators, electron guns, and particle accelerators.

356 Intermediate Electrodynamics Spring. 4 credits. Prerequisite: A&EP 355 and coregistration in Mathematics 422 or T&M 611, or permission of instructor.

3 lecs, 1 rec. R. V. Lovelace. Topics: electromagnetic wave phenomena, transmission lines, waveguides, dispersive media, scattering, radiation, reciprocity, physical optics, special relativity. Emphasis on physical concepts and their application to the design of microwave circuits, antenna arrays, and optically coupled systems.

361 Introductory Quantum Mechanics Spring. 4 credits. Prerequisites: A&EP 333 or Physics 318, coregistration in Mathematics 422 or T&M 611 and in A&EP 356 or Physics 326.

3 lecs, 1 rec. V. O. Kostyuchenko. A first course in the systematic theory of quantum phenomena. Topics include the square well, harmonic oscillator, hydrogen atom, and perturbation theory. At the level of Chapters 4-9 of Modern Physics and Quantum Mechanics, by Anderson.

363 Electronic Circuits (also Physics 360) Fall, Spring. 4 credits. Prerequisites: Mathematics 293 or permission of instructor; no previous experience with electronics is assumed. Fall term is generally less crowded.

1 lec, 2 labs. Fall, W. Ho; Spring, H. H. Fleischmann. This laboratory course focuses on designing, building, and testing analog, digital, and microprocessor-based circuits that are useful in electronic instrumentation. Analog topics include basic circuit concepts, applications of operational amplifiers in linear circuits, oscil-
3. The study can take a number for forms; for instance, design or analysis. 
4. Open to fourth-year students at discretion of instructor. 
5. 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 optical systems, comprehensive treatments of optical aberrations, and practical considerations of electron optical design. 
6. A group design study of a selected nuclear system. Emphasis is on safety, siting, and radiation protection in the design of nuclear systems. 

[401 Physics of Atomic and Molecular Processes Fall. 3 credits. Prerequisites: A&E 361, Physics 443, or permission of instructor. Not offered 1983-84. An introduction to the basics of contemporary problems in the physics of atomic and molecular processes, including atomic structure, chemical bonding, ionization, radiation resonance processes, and atomic and molecular spectroscopy.] 

423 Statistical Thermodynamics Spring. 4 credits. For engineering physics seniors; others by permission of instructor. 

3 lecs. 1 rec. B. R. Kusse. 
Quantum statistical basis for equilibrium thermodynamics, canonical and grand canonical ensembles, and partition functions. Quantum and classical ideal gases, and quantum fluids. Fermi-Dirac, Bose-Einstein, and Maxwell-Boltzmann statistics. Introduction to systems of interacting particles. At the level of Thermal Physics, by Kittel, and Statistical and Thermal Physics, by Reif. 

434 Continuum Physics Fall. 4 credits. Prerequisites: A&E 333 and 356 or equivalent. 

3 lecs. 1 rec. 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, plastic flow; Bernoulli's equation, vorticity and circulation, lift, viscous incompressible flow and the Navier-Stokes equations, Reynolds number, Poiseuille flow in a pipe, Stokes drag on a sphere; boundary layers, Blasius equations; flow instabilities, Rayleigh-Bénard convection and the onset of chaotic flow. Introduction to turbulent flow. 

490 Informal Study in Engineering Physics Credit to be arranged. 
Laboratory or 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, Physics 102 or 206, or permission of instructor. Offered alternate years. 

R. K. Clayton. 
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. 3 credits. Prerequisites: A&E 355, 356 or equivalent. Open to fourth-year students at discretion of instructor. 

3 lecs. R. N. Sudan. 
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. 

607 Advanced Plasma Physics (also EE 582) Spring. 3 credits. Prerequisite: A&E 606. 

3 lecs. R. N. Sudan. 
Boltzmann and Vlasov equations; waves in hot plasmas; Landau damping, micro-instabilities; drift waves, low-frequency stability, collisional effects, method of dressed test particle, high-frequency conductivity and fluctuations, neoclassical toroidal diffusion, high-powered beams. 

Selected topics discussed in detail include (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. 

3 lecs. V. Kostrovn. 
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 206, or permission of instructor. Offered alternate years. 

R. K. Clayton. 
Study of the mechanisms of seeing, embracing biological, physical, and chemical approaches to the subject. 

612 Nuclear Reactor Theory I Fall. 4 credits. Prerequisites: a year of advanced calculus and some nuclear physics. 

3 lecs. K. B. Cadby. 
Physical theory of fission reactors. Fission and neutron interactions with matter; theory of neutron diffusion; slowing down and thermalization; calculations of radial and neutron flux distribution in nuclear reactors. Reactor kinetics. At the level of Nuclear Reactor Theory, by Lamarch. 

613 Nuclear Reactor Theory II Spring. 3 credits. A continuation of A&E 612, primarily intended for students planning research in nuclear reactor physics and engineering. Prerequisite: A&E 612. 

3 lecs. K. B. Cadby. 
The Boltzmann transport equation, its adjoint, and their approximate solutions are developed and applied to the heterogeneous neutron chain reactor. 

Topics, credits, and schedule to be announced. Seminars on selected topics of current interest in biophysics research.] 

615 Membrane Biophysics Fall. 3 credits. Not offered 1983-84. W. W. Webb. 

[616 Modern Physical Methods in Macromolecular Characterization Spring. 3 credits. Prerequisite: permission of instructor or a course in quantum mechanics. Intended for advanced undergraduates or graduate students. Offered alternate years. Not offered 1983-84. 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 for measuring 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 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 fundamentals 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 optical systems, 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. Cadby. 
Thermodynamics 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&E 633. 

K. B. Cadby. 
A group design study of a selected nuclear system. Emphasis is on safety, siting, and radiation protection in the design of nuclear systems. 

[563 Seminar on Thermonuclear Fusion Reactor Engineering Fall. 3 credits. Prerequisites: A&E 606, 607, or equivalent; permission of instructor. Not offered 1983-84. 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 imbalances, and economics.] 

638 Intense Pulsed Electron and Ion Beams: Physics and Technology Spring 2 credits. Prerequisites: EE 601, 602 or equivalent; permission of instructor. 

D. A. Hammer. 
Topics include (1) theoretical aspects of intense electron and ion beams, such as intensity, divergence, 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 1 lab. Lectures on interaction of radiation with matter, radiation biology, and nuclear instruments and measurements. Fifteen experiments are available (with eight selected) on nuclear physics, radiation instrumentation and measurements, activation analysis, neutron moderation, and reactor physics and engineering; the subcritical reactor assembly and TRIGA reactor are used. At the level of Nuclear Radiation Detection, by Price, and Radiation Detection and Measurement, by Knoll. 

652 Advanced Nuclear and Reactor Laboratory Spring. 3 credits. Prerequisites: A&E 651 and 609 or 612. Offered on independent study basis or with sufficient demand, as a formal course. 

Two 2 1/2-hour afternoon periods.
Laboratory experiments and experimental methods in nuclear physics and reactor physics. Ten experiments are available, some using the Zero Power Reactor critical facility.

653 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.

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 W. Bath techniques, and the instrumentation involved in each characterization method (including charged-particle optics when appropriate).

662 Microprocessing of Materials Spring. 3 credits.

R. A. Buhrow.

An introduction to the fundamentals of fabricating and patterning thin-film materials and surfaces, with emphasis on electronic materials. Vacuum and plasma thin-film deposition processes. Photon, electron, X-ray, and ion-beam lithography. Techniques for pattern replication by plasma and ion processes. Emphasis is on understanding the physics and materials science that define and limit the various processes.

681-689 Special Topics in Applied Physics Topics, instructors, and credits to be announced each term. Typical topics include quantum superconducting devices, physics of semiconductor conductors, nonlinear fluctuations, biophysical processes, molecular fluorescence.

711 Principles of Diffraction (also MSE 610) Fall. 3 credits. Offered alternate years.

B. Vodopyanov.

Introduction to diffraction phenomena as applied to solid-state problems. Scattering and absorption of neutrons, electrons, and X-ray beams, with particular emphasis on synchrotron radiation X-ray sources. 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 imperfect 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.

761 Kinetic Theory (also EE 681) Fall. 3 credits.

Prerequisite: EE 407 or Physics 561 or permission of instructor. Offered alternate years.


See EE 681 for course description.

762 Physics of Solid Surfaces and Interfaces Fall. 3 credits. Lecture course primarily for graduate and qualified senior students. Prerequisites: Physics 454 and A&EP 381. Similar to MSE 703.

T. N. Rhodin.

A critical presentation of current understanding of the physics and chemistry of surface and interface phenomena in metals, semiconductors, 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 use of electron surface crystallography and chemical reactivity of both ideal and practical solid surfaces. Theory and application of modern methods of electron spectroscopy in ultrahigh physics. Material drawn from the current research literature is presented at the level of The Nature of the Surface Chemical Bond, edited by Rhodin and Ertl.

Chemical Engineering

101 Nonresident Lectures Fall. No credit. 1 lec. R. L. VonBerg.

Given by lecturers invited from industry and from selected departments of the University to assist students in their transition from college to industrial life.

112 Introduction to Chemical Engineering (also Engr 112) Fall, spring. 3 credits. Limited to freshmen.

3 lecs. F. Rodriguez.

For description see Engineering Common Courses.

219 Mass and Energy Balances (also Engr 219) Fall. 3 credits. Prerequisite: one year of freshman chemistry or permission of instructor.

3 lecs. F. Rodriguez. For description see Engineering Common Courses.

220 Mass and Energy Balances (also Engr 220) Summer. Not offered during academic year.

Prerequisite: one year of freshman chemistry. Chem E 220 is intended for students who cannot take Chem E 219.

R. G. Thorpe.

Self-paced audiosvisual instruction in the material of Chem E 219. For description see Engineering Common Courses.

311 Chemical Engineering Thermodynamics I Fall. 3 credits.

3 lecs. 1 computing session. W. B. Street.

A study of the first and second laws, with application to batch and flow processes. Thermodynamic properties of fluids; applications of thermodynamics to compressors, power cycles, refrigeration; thermodynamic analysis of processes.

312 Chemical Engineering Thermodynamics II Spring. 3 credits.

3 lecs. 1 computing session. K. E. Gubbins.


410 Reaction Kinetics and Reactor Design Fall. 3 credits. Prerequisites: Chem E 312 and 430.

3 lecs. J. F. Cocchi.

Study of chemical reaction kinetics and principles of reactor design for chemical processes.

430 Introduction to Rate Processes Fall. 3 credits. Prerequisites: Chem E 219 and engineering mathematics sequence.

3 lecs. 1 computing session. W. L. Olbracht.

Fundamentals of fluid mechanics and heat transfer; solutions to problems involving viscous flow, heat conduction and convection, friction factors and heat-transfer coefficients, macroscopic balances, elementary applications.

431 Analysis of Separation Processes Spring. 4 credits. Prerequisites: Chem E 430 and familiarity with FORTRAN or PL/1.

3 lecs. 1 computing session. R. G. Thorpe.

Analysis of separation processes involving phase equilibria and rate of mass transfer; some use of the digital computer. Phase equilibrium, multi-component, and extractive distillation; liquid-liquid extraction; gas absorption; crystallization.

432 Chemical Engineering Laboratory Fall. 3 credits. Prerequisite: Chem E 430, 431.

2 lecs. 1 lab. R. L. VonBerg and staff.

Laboratory experiments in fluid dynamics, heat and mass transfer, other operations. Correlation and interpretation of data. Technical report writing.

433 Project Laboratory Fall, spring. Credit variable. Prerequisite: Chem E 432.

Special laboratory projects involving bench-scale or pilot-plant equipment.

434 Transport Phenomena Spring. 3 credits. Strongly recommended for those interested in graduate study in chemical engineering.

3 lecs. W. L. Olbracht.


461 Chemical Process Evaluation Fall. 3 credits. P. Harriott.

Study of some important chemical processes, covering sources of raw materials, analysis of reaction conditions, and product purification.

462 Chemical Process Synthesis Spring. 4 credits. Prerequisite: Chem E 432.

R. L. VonBerg and staff.

A consideration of process and economic alternatives in selected chemical processes; design and assessment.

463 Computer Applications in Chemical Engineering Fall. 3 credits. Prerequisite: CS 100 or equivalent.

2 lecs. 1 computing session. P. Clancy.

Modern computing techniques for solving current problems in chemical engineering. Basic research and applications both in industry and in the university. Computer graphics, on-line data analysis, and numerical management. Extensive hands-on opportunities.

563 Process Equipment and Design Selection Fall. 3 credits. Prerequisites: Chem E 430 and 431 or equivalent.

3 lecs. J. C. Smith.

Performance, selection, and design of process equipment; storing, transporting, mixing, heating, and separating fluids and solids. Process development and decision among alternatives.

564 Design of Chemical Reactors and Multi-phase Contacting Systems Spring. 3 credits.

3 lecs. P. Harriott.

Design, scale-up, and optimization of chemical reactors with allowance for heat and mass transfer, nonideal flow, and catalyst aging. Selection of systems for gas-liquid contacting, including stirred tanks, fluidized beds, and fixed beds.

565 Design Project Spring. 3 or 6 credits. Prerequisites: Chem E 563, 564.

Staff.

Design study and economic evaluation of a chemical processing facility, alternative methods of manufacture, raw-material preparation, food processing, waste disposal, or some other aspect of chemical processing.

566 Computer-aided Process Design Spring. 3 credits. Prerequisite: concurrent registration in 462 or a previous course in process design.

3 lecs. G. F. Scheele.

An introduction to the synthesis and use of computer systems for steady-state simulation and optimization of chemical processes.
of stabilization and degradation, including processes for recycling and disposal of plastics and related products.

651 Numerical Methods in Chemical Engineering Fall 3 credits. Prerequisite: Chem E 461 or equivalent.

661 Air Pollution Control Fall 3 credits. Prerequisite: Chem E 410 and 430.

671 Process Control Laboratory Spring 1 credit. Prerequisites: Chem E 410 and 430.

673 Adsorption and Catalysis Spring 2 credits. R. P. Merril.

711 Advanced Chemical Engineering Thermodynamics Fall 3 credits. Prerequisite: Chem E 312 or equivalent.

713 Applied Chemical Kinetics Fall 3 credits. Prerequisite: physical chemistry. R. P. Merril.

721 Advanced Transport Phenomena Spring 3 credits. Prerequisite: Chem E 434 or equivalent.

751 Mathematical Methods of Chemical Engineering Analysis Fall 4 credits. 3 lecs. P. H. Steen.

772 Theory of Molecular Liquids Spring 3 credits. Prerequisite: Chem E 711 or equivalent.

790 Seminar Fall and spring. 1 credit each term. General chemical engineering seminar required of all graduate students in the Field of Chemical Engineering.

792 Advanced Seminar in Thermodynamics Fall, spring. 1 credit. K. E. Gubbins.

891, 892, 893 Thesis Research Fall, spring, fall. Thesis research for the M.S. degree in chemical engineering.

891, 892, 993, 994, 995 Thesis Research Fall, spring, spring. Thesis research for the Ph.D. degree in chemical engineering.

Civil and Environmental Engineering

General

113 Computer-aided Design In Environmental Systems (also Engr 113) Fall 3 credits. 3 lecs.


301 Numerical Solutions to Civil Engineering Problems Fall 3 credits. Introduction to numerical and computer methods through consideration of typical problems drawn from a number of disciplines within civil and environmental engineering. Topics include computer use, computer programming, data handling, numerical analysis, and the role of computing in the civil engineering profession.

304 Uncertainty Analysis in Engineering Fall 4 credits. Prerequisite: first-year calculus. Not offered 1983-84.

Staff.

An introduction to probability theory, statistical techniques, and uncertainty analysis, with examples drawn from civil, environmental, agricultural, and related engineering disciplines. The course covers data presentation, probability theory, commonly used probability distributions, parameter estimation, goodness-of-fit tests, confidence intervals, hypothesis testing, simple linear regression, and some nonparametric statistics and decision theory. Examples include structural reliability, models of vehicle arrivals, analysis of return-period calculations, and distributions describing wind speeds, floods, pollutant concentrations, and soil and material properties.

305 Surveying for CEE Facilities Fall (spring on demand). 3 credits. Prerequisites: Mathematics 192 and a course involving physical measurements. Recommended: Engr 260 or 270.

2 lecs. 1 lab, evening tests. G. B. Lyon.
other results of surveying for the physical location of civil and environmental engineering facilities. Major topics: measurement and data-reduction procedures for determination of positions, development and application of quality-control criteria for surveying measurements; compilation of topographic maps from data bases acquired by terrestrial and photogrammetric methods; use of topographic maps in planning and design of highways, surveying for construction.

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 interrelationships between the physical, social, economic, and ethical constraints on engineering design.

601 Numerical Solutions to Civil Engineering Problems Fall. 3 credits. Introduction to numerical and computer methods through consideration of typical problems drawn from a number of disciplines within civil and environmental engineering practice. Topics include computer applications, computer programming, data handling, numerical analysis at the graduate level, and the role of computing in the civil engineering profession.

602 Boundary Surveys Fall. 3 credits. Prerequisite: an introductory course in surveying or permission of instructor. G. B. Lyon. Legal principles governing the physical location of property boundaries. Historical development and methods of original surveys. Coordinate systems, retracement surveys, and restoration of property boundaries. Historical development and design procedures.

603 Photogrammetry Spring. 3 credits. Prerequisite: an introductory course in surveying or permission of instructor. G. B. Lyon. Aerial and terrestrial photogrammetry. Photograph geometry. Tilt and relief displacements. Parallax. Control requirements and flight planning. Relative and absolute orientation of stereo models. Colinearity and colplanarity conditions. Balplex and other stereoplotter.

701 Environmental Engineering Design Seminar Fall and 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. 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: Environmental Applications Spring. 3 credits. Prerequisite: permission of instructor. 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.


613 Image Analysis I: Landforms Fall. 3 credits. Prerequisite: permission of instructor. T. Liang. 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. T. Liang. Study of physical environments using aerial photographs and other remote sensing methods. Conventional photography, spectral, space, and sequential photography; thermal and radar imagery; Arctic, tropic, arid, and humid climate regions. Project applications.

616 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.

617 Research—Remote Sensing On demand. 1-6 credits. Staff. For students who want to study one particular area in depth. The work involves the development of laboratory investigation; field study; theoretical analysis; or development of design procedures.

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. 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.

810 Thesis—Remote Sensing Fall and spring. 1-12 credits. Students must register for credit with the advisor 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) Fall. 4 credits. Prerequisite: one year of college-level mathematics. A liberal elective for engineers. R. E. Schuler. Intermediate microeconomic analysis similar to Economic Analysis 311 but emphasizing mathematical techniques and engineering-design implications. Theory of households, firms, monopoly and competitive markets, distribution and equilibrium welfare economics.


333 Engineering Economics and Management Spring. 3 credits. Primarily for juniors and seniors. D. P. Louch. 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 estimate costs and 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.

335 Social Implications of Technology Fall. 3 credits. Approved liberal elective, open to freshmen.

625 Environmental Law I (also Toxicology 625) Spring. 3 credits. Limited to graduate students and upperclass undergraduates. Not offered 1983-84. N. Orloff. An interdisciplinary seminar dealing with the social consequences of technological developments, and means by which technology can be guided in socially beneficial directions.

626 Environmental Law II Spring. 3 credits. Limited to graduate students and upperclass undergraduates. Not offered 1983-84. N. Orloff. 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) Spring. 4 credits. Limited to graduate students and seniors; other undergraduates with permission of instructor. N. Orloff. 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. 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.

627 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 320 or an introductory optimization course. C. A. Shoemaker. Use of systems analysis in engineering design for solutions to public-sector and environmental problems. Applications to water-resource, energy-production, and facility-location problems.

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. Credit variable. Prerequisite: permission of instructor. May extend over two semesters. Staff. Design or feasibility study of environmental or water-resource systems, supervised and assisted by one or more faculty advisers; individual or group participation. Final report required.

722 Environmental and Water Resources Systems Analysis Research On demand. Credit variable. Prerequisite: permission of instructor. Preparation must be suitable to the investigation to be undertaken. Investigations of particular environmental or water-resource systems problems.

729 Special Topics in Environmental or Water Resources Systems Analysis On demand. Credit variable. Staff. Supervised study, by individuals or small groups, of one or more specialized topics not covered in regular courses.

Fluid Mechanics and Hydrology

331 Fluid Mechanics Fall. 4 credits. Prerequisite: Engr 203 (may be taken concurrently). 3 lecs, 1 rec. Evening exams. Staff. Hydrostatics, the basic equations of fluid flow, potential flow and dynamic pressure forces, viscous flow and shear forces, steady pipe flow, turbulence, dimensional analysis, open-channel flow. Elements of design in water supply systems, canals, and other hydraulic systems.

332 Hydraulic Engineering Spring. 3 credits. Prerequisite: CEE 331. 2 lecs, 1 lab, field trips. Staff. Application of fluid-mechanical principles to problems of engineering practice and design: hydraulic machinery, water-distribution systems, open-channel design, river engineering, groundwater flow, and pollutant dispersion. 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 1983-84. W. H. Brutsaert. Introduction to hydrology as a description of the hydrologic cycle and the role of water in the natural environment. Topics include precipitation, infiltration, evaporation, groundwater, surface runoff, floods, and droughts.]


631 Dynamic Oceanography Fall. 3 credits. Prerequisite: CEE 331. Not offered 1983-84. P. L.-F. Liu. The statics and dynamics of oceans and lakes. Currents in homogeneous and stratified bodies of water; tidal motions; waves in a stratified ocean.


634 Engineering Micrometeorology Spring. 3 credits. Prerequisite: CEE 331. Not offered 1983-84. 3 lecs. W. H. Brutsaert. Physical processes in the lower atmospheric environment: turbulent transport in the atmospheric boundary layer, surface-air interaction, disturbed boundary layers, 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. Introduction to mass and heat-transport processes due to pollutant discharges into the environment. Turbulent diffusion equation and its solution for instantaneous and continuous releases. Concept of longitudinal dispersion in shear flow. Applications to pollutant-transport prediction in lakes, rivers, estuaries, and coastal zones, as well as the atmosphere. Relative role of hydrodynamic 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 credits. Hours to be arranged. Staff. The student may elect a design project or undertake the design and construction of special equipment in the fields of fluid mechanics, hydraulic engineering, or hydrology.

638 Hydraulics Seminar Spring. 1 credit. Open to 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. Credit variable. Staff. Special topics in fluid mechanics, hydraulic engineering, or hydrology.

730 Coastal Engineering II Fall. 3 credits. Prerequisite: CEE 636 or permission of instructor. Offered alternate years. Not offered 1983-84. 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 flow in environmental applications, including interaction with buoyancy. Integral techniques for self-similar flows: 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. Not offered 1983-84. 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. Prerequisite: CEE 636 or equivalent. Not offered 1983-84. 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 socioeconomic damages. Pollutant-abatement strategies and transient-release techniques. Models for regional energy-facility siting.


735 Research in Hydraulics On demand. Variable credit. Staff. The student may select an area of investigation in fluid mechanics, hydraulic engineering, or hydrology. The work may be either experimental or theoretical in nature. Results should be submitted to the instructor in charge in the form of a research report.

Geotechnical Engineering

341 Introductory Soil Mechanics Spring. 3 credits. 2 lecs, 1 lab. Tutorial T. D. O'Rourke.

640 Foundation Engineering Fall. 3 credits
Prerequisite: CEE 341.

641 Retaining Structures and Slopes Spring. 3 credits.
Prerequisite: CEE 341.

642 Highway Engineering (also Ag En 491) Spring. 3 credits.
Prerequisite: CEE 341. Junior standing in engineering, fluid mechanics, and soil mechanics (may be taken concurrently). Offered alternate years. 2 lecs, 1 lab. L. H. Irwin. See Ag En 491 for course description.

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 1983-84. 3 lecs, 1 lab. L. H. Irwin. See Ag En 692 for course description.

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.
3 lecs. 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.
Supervised study of special topics not covered in the formal courses.

740 Engineering Behavior of Soils Fall. 3 credits
Prerequisite: CEE 341.

741 Rock Engineering Fall. 3 credits
Prerequisite: CEE 341 or permission of instructor.

742 Graduate Soil Mechanics Laboratory Fall. 3 credits.
Prerequisite: CEE 740.
I. Ishibashi.
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 1983-84.
3 lecs. Staff. A continuation of CEE 640, with detailed emphasis on special topics in soil-structure interaction. Typical topics include lateral and pullout loading of deep foundations, pile group behavior, foundations for offshore structures, pile-driving dynamics, foundations for special structures.

745 Soil Dynamics Spring. 3 credits.
Prerequisite: permission of instructor.
3 lecs. I. Ishibashi. Study of soil behavior under dynamic loadings. Laboratory and field techniques for determining dynamic soil properties, strength of liquefaction. Design examples of foundations and embankments.

746 Embankment Dam Engineering Spring. 2 credits.
Prerequisites: CEE 641 and 741, or permission of instructor.

747 Case Studies In Geotechnical Engineering Spring. 3 credits. Prerequisites: CEE 641 and 741. Not offered 1983-84.

748 Tunnel Engineering Spring. 2 credits.
Prerequisites: CEE 641 and 741. Not offered 1983-84.

749 Research In Geotechnical Engineering
On demand. 1-6 credits.
Staff. For the student who wants to pursue a particular geotechnical topic in considerable depth.

Environmental Quality Engineering

351 Environmental Quality Engineering Spring. 3 credits.
3 lecs. L. W. Lion.
Introduction to engineering aspects of environmental quality control. 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.

651 Microbiology of Water and Wastewater Fall. 2 credits.
Prerequisite: one semester of college chemistry.
J. M. Gossett.
Microbiological phenomena pertinent to analysis of natural systems and design of engineered microbial processes in pollution control.

652 Assimilation of Pollutants in Natural Systems Spring. 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. R. C. Loehr.
An analysis of the treatment and disposal of industrial wastes, primarily wastewaters. Regulatory and legal aspects; pretreatment, treatment and disposal processes for conventional, nonconventional, and toxic pollutants, industrial-waste survey; case studies of specific industries; opportunities for recycling and reuse. Emphasis is on an understanding of the constraints on industrial-waste discharges and the processes and approaches to meet those constraints.

654 Aquatic Chemistry Spring. 3 credits.
Prerequisites: CEE 351 and 653 or permission of instructor.
3 lecs. L. B. Dworsky.
Development of fundamental concepts of chemical equilibria and application to natural aquatic systems as well as to water and wastewater treatment systems. Topics include chemical thermodynamics, acid-base reactions, oxidation-reduction, coordination chemistry, biologically mediated reactions, and interfacial phenomena. Emphasis is placed on phenomena, mathematical solution of chemical equilibria, and their application to the prediction and management of water quality.

655 Industrial Waste Management Spring. 3 credits.
Prerequisites: CEE 351 and 653 or permission of instructor.
3 lecs. L. W. Lion. An analysis of the treatment and disposal of industrial wastes, primarily wastewaters. Regulatory and legal aspects; pretreatment, treatment and disposal processes for conventional, nonconventional and toxic pollutants, industrial-waste survey; case studies of specific industries; opportunities for recycling and reuse. Emphasis is on an understanding of the constraints on industrial-waste discharges and the processes and approaches to meet those constraints.

656 Environmental Quality Management Fall.
Spring on demand. 3 credits (4 with approval of instructor). For upperclass or graduate students. May not be offered 1983-84.
2 lecs. L. B. Dworsky. An introduction to environmental quality management, nature, cause, and control of environmental problems; interaction of physical, social, and cultural environments. Emphasis on the interdependent social, economic, developmental, and environmental issues confronting society.

658 Sludge Treatment, Utilization, and Disposal Spring. 3 credits.
Prerequisite: CEE 351 or permission of instructor.
3 lecs. R. I. Dick.
An analysis of the quantity and quality of residues produced from municipal and industrial water-supply and pollution-control facilities as a function of process design and operational variables; the alternatives for reclamation or ultimate disposal of residues with assessment of potential environmental impacts and factors influencing the magnitude of those impacts; the fundamental factors influencing performance of treatment processes for altering sludge properties prior to ultimate disposal; and considerations in selection and integration of sludge-management processes to approach optimal design.

659 Environmental Quality Engineering Seminar Fall, spring. 1 credit.
Open to undergraduates with permission of instructor. Presentation and discussion of current topics and problems in sanitary engineering and environmental quality engineering.
752 Water Quality Laboratory Fall. 1 credit. Enrollment limited. Prerequisites: CEE 653 (or concurrent enrollment) and permission of instructor. J. M. Goss. Laboratory methods for analysis of pollutants in water and wastewater.

755 Environmental Engineering Processes I Fall. 3 credits (4 with lab). Prerequisite: CEE 653 or permission of instructor. 3 lecs, 1 lab. L. W. Lion. Theoretical and engineering aspects of chemical and physical phenomena and processes applicable to the removal of impurities from water, wastewater, and industrial wastes, and to their transformation in receiving waters. Analysis and design of treatment processes and systems. Pertinent laboratory studies.

756 Environmental Engineering Processes II Spring. 3 credits (4 with lab). Prerequisite: CEE 755 or permission of instructor. 3 lecs, 1 lab. J. M. Goss. 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 and spring. 3 credits. Students must register for credit with the professor at the start of each term. A thesis research topic is selected by the student with the advice of the faculty member in charge and is pursued either independently or in conjunction with others working on the same topic.

Transportation

361 Introduction to Transportation Engineering Spring. 3 credits. A. H. Meyburg. Introduction to technological, economic, and social aspects of transportation. Emphasis on design and functioning of transportation systems and their components. Vehicle and system technology; traffic flow and control; terminal operations; supply-demand interactions; system planning, design, and management; and institutional issues.

660 Urban Transportation Planning Fall. 4 credits. G. P. Fisher. 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. A laboratory period is designed for team-study projects using computerized planning-system packages.

661 Travel Demand Theory and Applications Spring. 3 credits. Prerequisite: CEE 660 or permission of instructor. A. H. Meyburg. 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 361 and OR&IE 320, or permission of instructor. M. A. Turnquist. 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 Spring. 3 credits. Recommended: CEE 361 or CEE 660, or permission of instructor. M. A. Turnquist. 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.

784 Special Topics in Transportation Fall, spring. Variable credit. Staff. Consultation 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


373 Structural Design Fall. 4 credits. Prerequisites: CEE 372 or permission of instructor. CEE 376 and Engr 261 are also required but may be taken concurrently. Evening exams. T. Pekoz. Continues the study of the behavior and design of steel and concrete members and structures. Structural elements, connections, and systems. Plastic analysis of steel frames.

374 Structural Design Project Spring. 4 credits. Prerequisite: CEE 373. Staff. Intended to develop an understanding of the structural design process. Comprehensive design project. Lectures on preliminary design; composite construction; prestressed concrete; various structural systems such as bridges, roofs, and tall buildings; seismic design.

375 Structural Behavior Laboratory Spring. 2 credits. Prerequisites or corequisite: CEE 372. 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. Slate. 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.


672 Fundamentals of Structural Mechanics Fall. 3 credits. Prerequisite or corequisite: CEE 373. R. N. White. Theory of elasticity, energy principles, plate flexure, failure theories, inelastic stress-strain relationships, stress concentration, introduction to fracture, fatigue.

673 Advanced Structural Analysis Fall. 3 credits. Prerequisites: CEE 372 and computer programming. Staff.
Direct stiffness and flexibility methods in matrix formulation, use of standard analysis programs, error detection, substructuring, and special analysis procedures.

[674 Structural Model Analysis and Experimental Methods] Fall. Prerequisite: Not offered 1983-84. 2 lecs, 1 lab, R. N. White. Dimensional analysis and similarity. Model materials, fabrication, loading, instrumentation techniques, and use of design. Experimental stress analysis.

675 Advanced Plain Concrete Spring. 3 credits. Prerequisite: CEE 367 or equivalent. 2 lecs, conferences. F. O. Slate. Topics such as history of cementing materials, air entrainment, light-weight aggregates, petrography, durability, chemical reactions, properties of aggregates, and construction. Relationships among internal structure and physical, chemical, and mechanical properties.

676 Structure and Properties of Materials Spring. 3 credits. Limited to graduate students in engineering or physical sciences, or undergraduates by permission of instructor. Offered alternate years. 2 lecs, conferences. F. O. Slate. Internal structure from amorphous to crystalline state. Forces holding matter together versus forces causing deformation and failure. Correlation of internal structures with physical and mechanical properties. Applications to various engineering materials.

678 Low-Cost Housing Primarily for Developing Nations Spring. 3 credits. Offered alternate years. 2 lecs, conferences. F. O. Slate. A multidisciplinary course. Students work intensively, usually in their own discipline, for a term project while also being introduced to problems and approaches of other disciplines. Engineers investigate the technological aspects of the subject and other aspects that influence technological decisions, such as cultural and economic factors.

679 Low-Cost Housing for Developing Nations—Workshops for Physical Planning, Site Selection, and Design Spring. A mixed class of advanced civil engineering and architecture students. Offered alternate years. F. O. Slate. Discussions and workshops on physical planning, site selection, choice of materials, and detailed design of individual structures and groupings.

680 Structural Engineering Seminar Fall and spring. 1 credit. Limited to qualified seniors and graduate students. Staff. Presentation of topics of current interest in the field of structures.


773 Structural Reliability Spring. 3 credits. Prerequisite: CEE 373. M. D. Grigoriu. Review of probability theory, practical measures for structural reliability, second-moment reliability indices, probability models for strength and loads, load combinations, probability-based design codes, reliability of structural systems with applications, introduction to random vibration, applications to wind and seismic design.


775 Advanced Reinforced Concrete Fall. 3 credits. Prerequisite: CEE 373. Recommended: CEE 374. 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. W. McGuire. Behavior and design, with emphasis on connections, torsion of steel members, columns, and beam columns.

777 Advanced Behavior of Metal Structures Spring. 3 credits. Prerequisite: CEE 373. W. McGuire. Behavior and design of tall-building systems. Cold-formed steel. Fatigue.

778 Shell Theory and Design Spring. 3 credits. Offered alternate years. P. Gergely. Fundamentals of practical shell theory. Differential geometry of surfaces; membrane and bending theory of shells; analysis and design of cylindrical shells, polygonal domes, and paraboloids.

779 Structural Design for Dynamic Loads Spring. 3 credits. P. Gergely. Modal analysis, numerical methods, and frequency-domain analysis. Introduction to earthquake-resistant design.

780 Optimum Structural Design Fall. 3 credits. Offered alternate years. Not offered 1983-84. Design of structures for minimum weight or cost includes full-stressed design, classical minimization procedures, and mathematical programming methods.

781 Numerical Methods in Structural Engineering Fall. 3 credits. Prerequisites: CEE 672 and 673. Offered alternate years. Not offered 1983-84. 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: 772. Offered alternate years. J. F. Abel. Lectures and colloquia on selected advanced topics and research in progress, including dynamics, nonlinear analysis, shells, fracture mechanics, fluid dynamics, and computer graphics.

783 Civil and Environmental Engineering Materials Project On demand. 1-3 credits. Staff. Individual projects or reading and study assignments involving engineering materials.

784 Design Project in Structural Engineering Fall, spring. Variable credit. Students may elect to undertake a design project in structural engineering. The work is supervised by a professor in this subject area.


786 Special Topics in Structural Engineering On demand. Variable credit. Hours to be arranged. Staff. Individually supervised study or independent design on general or specialized topics not covered in regular courses.

788 Thesis—Structural Engineering Fall and 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.

789 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.


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 105) Fall, spring, summer. 4 credits. Students who plan to take both CS 101 and 100 must take 101 first. 2 lecs, 1 rec (optional), 3 evening exams. An introduction to elementary computer programming concepts. Emphasis is on techniques of problem analysis and algorithm and program development. The subject matter of the course is programming, not a particular programming language. The principal programming language is PL/1; FORTRAN is introduced and used for final problems. The course does not presume previous programming experience. An introduction to numerical computing is included. Although no college-level mathematics is presumed, programming assignments are tested and run on interactive, stand-alone microcomputers.

100 Advanced Placement in Computing Fall. 2 lecs plus 2 AP credits. S-U grades only. To take this course, enroll in CS 100 or Engr 105 for 2 credits. 2 lecs, 2 evening exams. Entering freshman and transfer students with significant previous exposure to computing can elect this advanced-placement placement section of CS 100, which covers essentially the same material as other sections but at an accelerated pace, so that the course is finished after the first six weeks of the fall term. This advanced-placement section provides a systematic review of programming concepts and an introduction to the modified version of PL/1 used at Cornell. Upon successful completion of the advanced-placement section, students receive a grade of S for CS 100, which is worth two credits, plus two advanced placement credits in programming. Students may transfer at any time during the six weeks from the advanced-placement section to a full-term, four-credit section of the course.

101 The Computer Age Fall, 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 PL/1 programs using the Cornell Program Synthesizer. The amount of programming in the course is that taught in CS 100. Each student writes a term project 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.

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. Intermediate programming in a high-level language and introduction to computer science. Topics include program development, invariant relations, block structure, recursion, introduction to data structures, and analysis of algorithms. PL/1 is the principal programming language.

280 Discrete Structures Fall, spring, 4 credits. Prerequisite: CS 211 or permission of instructor. Covers mathematical aspects of programming and computing. Topics will be chosen from the following: mathematical induction; logical proof; the 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.

314 Introduction to Computer Systems and Organization Spring, summer. 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.

321 Numerical Methods (also Engr 321) Fall, spring. 4 credits. Prerequisites: CS 100 and Mathematics 221 or coregistration in Mathematics 294. 3 lecs. Students solve representative problems by programming appropriate algorithms and using library programs. Numerical methods for systems of linear equations, interpolation, integration, ordinary differential equations, nonlinear equations, optimization, and linear least squares. Some mathematical analysis of the algorithms is presented.

410 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. Dynamic storage allocation and memory management. Detailed study of searching and sorting methods. Analysis to determine the more efficient algorithm in a given situation.

411 Programming Languages and Logics Spring. 4 credits. Prerequisites: CS 410 and permission of instructor. 2 lecs. Introduction to the major language families with emphasis on program explanations and logics of programming. Some study of language implementations. Topics include introduction to methods of language definition, imperative languages (e.g., Pascal), object-oriented languages (Smalltalk), and applicative and functional languages (LISP, FP). Projects are assigned in Pascal and LISP.

414 Systems Programming and Operating Systems Fall. 3 credits. Prerequisite: CS 314 or permission of instructor. 2 lecs, 2 evening exams. Introduction to the logical design of systems programs with emphasis on multiprogrammed operating systems. Topics include process synchronization, deadlock, memory management, input/output methods, information sharing, protection and security, and file systems. The impact of network and distributed computing environments on operating systems is also discussed.

415 Practicum in Operating Systems Fall. 2 credits. Corequisite: CS 414. 1 rec. The practical aspects of operating systems are studied through the design and implementation of an operating system kernel that supports multiprogramming, virtual memory, and various input/output devices. All the programming for the project is in a high-level language.

417 Interactive Computer Graphics (also Architecture 334) Spring. 4 credits. Enrollment limited for 1983-84. Requires instructor's signature. Prerequisite: CS 314. 2 lecs, 1 lab. Introduction to the software and hardware concepts of interactive computer graphics. Topics include input methods, graph 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.

432 Introduction to Database Systems Spring. 4 credits. Prerequisite: CS 211 or permission of instructor. 2 lecs, 1 rec. Introduction to modern database systems, including data models, processing and query languages, file-organization schemes, and problems associated with distributed and concurrent processing.

481 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.

482 Introduction to Analysis of Algorithms Spring. 4 credits. Prerequisites: CS 410 and 481 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.

484 Introduction to Symbolic Computation Spring. 4 credits. Prerequisites: CS 481, or Mathematics 332, or Mathematics 432, or permission of instructor. Not offered 1983-84. 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. 1-8 credits. Prerequisite: graduate standing in computer science or permission of instructor. 1 lec.
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 "calculas" for the derivation of programs.

611 Advanced Programming Languages Fall 4 credits. Prerequisite: CS 410 or permission of instructor.
3 lecs.
Introduction to techniques for formal specification of programming languages and data types, including term-rewriting systems and Scott's denotational techniques, bootstrapping methods, and translator writing systems.

612 Translator Writing Spring. 4 credits. Prerequisites: CS 410 and 481 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, bootstrapping methods, and translator writing systems.

613 Concurrent Programming and Operating Systems Principles Spring 4 credits. Prerequisites: CS 414 and 600 or permission of instructor.
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.

615 Machine Organization Spring. 4 credits. Prerequisite: CS 314 or permission of instructor. Not offered 1983-84.
3 lecs.
The analysis and implementation of algorithms for the numerical solution of basic mathematical problems. Emphasis is placed on the estimation of error, the analysis of stability, and how to design efficient and reliable numerical algorithms. The student solves representation problems by writing original programs and by making use of high-quality, state-of-the-art software. Fall term: direct methods for linear equations, interpolation, least squares and polynomial approximation, nonlinear equations, and optimization. Spring term: quadrature, ordinary and partial differential equations, methods for sparse systems of linear equations, and eigenvalue problems.

621–622 Numerical Analysis 621, fall; 622, spring. 4 credits each term. Prerequisites: CS 321 and Mathematics 411 and 431, or permission of instructor.
3 lecs.
The analysis and implementation of algorithms for the numerical solution of basic mathematical problems. Emphasis is placed on the estimation of error, the analysis of stability, and how to design efficient and reliable numerical algorithms. The student solves representation problems by writing original programs and by making use of high-quality, state-of-the-art software. Fall term: direct methods for linear equations, interpolation, least squares and polynomial approximation, nonlinear equations, and optimization. Spring term: quadrature, ordinary and partial differential equations, methods for sparse systems of linear equations, and eigenvalue problems.

632 Database Systems Fall. 4 credits. Prerequisites: CS 410 and 432 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 410 or permission of instructor.
2 lecs.

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.

681 Analysis of Algorithms Fall 4 credits. Prerequisite: CS 481 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 482.

682 Theory of Computing Spring. 4 credits. Prerequisite: CS 481 or permission of instructor.
3 lecs.
Advanced treatment of theory of computation: computational-complexity theory, and other topics in computer 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 481 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.
2 lecs.
Discussion of contemporary issues in operating systems.

717 Seminar In Programming Refinement 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. 4 credits. Prerequisite: permission of instructor. S-U grades only.

733 Topics In Information Processing Fall. Credit to be arranged. Prerequisite: CS 733 or permission of instructor. Not offered 1983-84.

734 Seminar In File Processing Fall. 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.

799 Special Investigations In Computer Science Fall, spring. 3 credits. Prerequisite: permission of a computer science adviser. Master's degree research.

990 Special Investigations In Computer Science Fall, spring. S-U grades only. Prerequisite: permission of a computer science adviser. Doctoral research.
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, Ferro-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
Fall. 4 credits. Prerequisite: Mathematics 294.

3 lecs., 1 rec-computing session. Introduction to mathematical modeling of 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: EE 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.

316 Electrical Laboratory II
Spring. 4 credits. Prerequisite: EE 303 and 315.

2 lecs., 2 labs. Laboratory studies of solid-state phenomena and devices; experiments illustrating the use of the digital computer in electrical engineering; laboratory studies of high-frequency phenomena and devices; and introduction to AC and DC machinery.

407 Quantum Mechanics and Applications
Fall. 4 credits. Prerequisite: EE 306.


421 Bioluminescence
Fall. 3 credits (4 credits with lab). Prerequisites: EE 301 and 316.

3 lecs., 1 lab. The acquisition and processing of biological signals. Topics include electrodes, ion-selective electrodes, temperature transducers, pressure transducers, flow transducers, force transducers, optical transducers, operational amplifiers, instrumentation amplifiers, signal conditioning systems, and digital processing with minicomputers and microprocessors.

422 Neuroelectric Systems (also Biological Sciences 422)
Spring. 3 credits (4 credits with lab). Prerequisite: either EE 301 or 421 or Biological Sciences 423, 424, 495, or 496, written permission of instructor required for lab.

423 Digital Signal Processing
Fall. 3 credits (4 with lab). Prerequisites: EE 423 or permission of instructor.

Topics include FIR and IIR filter design, the DFT, FFT, and CZT; 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 microprocessor-based filter systems. At the level of Theory and Application of Digital Signal Processing, by Rabner and Gold.

427 Fundamentals of Analog and Discrete-Time Circuits
Spring. 4 credits. Prerequisite: EE 302.

Fall. 4 credits; spring, 3 or 4 credits. Basic theory of analog networks. Linearity, time invariance, causality, passivity, stability. Analogous digital-system properties. The scattering formalism. Applications to physical realizability, reactance theorems, dispersion, gain-phase design. Realization of discrete-time circuits.

428 Analog and Discrete-Time Circuit Applications
Spring. 4 credits. Prerequisite: EE 423, 427, or equivalent. Not offered 1983-84.


430 Introduction to Lasers and Optical Electronics
Spring. 4 credits. Prerequisite: EE 306 or equivalent (such as Physics 443).

2 lecs., 1 rec-computing, 1 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 electrodynamics, stresses applications to modern devices. Discussions of applications include the operating principles of a variety of important lasers, propagation characteristics of laser beams, practical optical systems, 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
Fall, 431; spring, 432. Fall, 4 credits; spring, 3 or 4 credits.

Prerequisites: EE 230 and 316.

3 lecs., 1 rec-computing, 1 lab. R. P. Capps, B. L. Brown. Application of microprocessors for neuroscience, data acquisition and analysis systems. Lectures cover electrical activity of single nerve cells, electrodes and instrumentation techniques, analysis of electrophysiological data, and coding principles in the nervous system. Laboratory exercises provide experience in the analysis of biological signals.

433 Introduction to Analog and Digital Signal Processing
Fall. 3 credits (4 with lab). Prerequisite: EE 301.


442 Computer Methods in Electrical Engineering
Spring. 4 credits. Prerequisite: EE 301.

3 lecs. Modern techniques for solving electrical engineering problems on the digital computer. Emphasis on efficiency and numerical stability rather than on theoretical implications. Solution of linear and nonlinear algebraic equations; integration; solution of ordinary and partial differential equations; use of the digital computer in analog signal processing applications; applications to power systems, control systems, communication systems, circuit design, and problems in electrophysics.

426 Digital Signal Processing
Spring. 3 credits (4 with lab). Prerequisite: EE 423 or permission of instructor.

Fall. 3 lecs., 1 rec-computing. Design of FIR and IIR filter design, the DFT, FFT, and CZT; 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 microprocessor-based filter systems. At the level of Theory and Application of Digital Signal Processing, by Rabner and Gold.

427 Fundamentals of Analog and Discrete-Time Circuits
Spring. 4 credits. Prerequisite: EE 302.

Fall. 4 credits; spring, 3 or 4 credits. Basic theory of analog networks. Linearity, time invariance, causality, passivity, stability. Analogous digital-system properties. The scattering formalism. Applications to physical realizability, reactance theorems, dispersion, gain-phase design. Realization of discrete-time circuits.

428 Analog and Discrete-Time Circuit Applications
Spring. 4 credits. Prerequisite: EE 423, 427, or equivalent. Not offered 1983-84.


430 Introduction to Lasers and Optical Electronics
Spring. 4 credits. Prerequisite: EE 306 or equivalent (such as Physics 443).

2 lecs., 1 rec-computing, 1 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 electrodynamics, stresses applications to modern devices. Discussions of applications include the operating principles of a variety of important lasers, propagation characteristics of laser beams, practical optical systems, 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
Fall, 431; spring, 432. Fall, 4 credits; spring, 3 or 4 credits.

Prerequisites: EE 230 and 316.

3 lecs., 1 rec-computing, 1 lab. R. P. Capps, B. L. Brown. Application of microprocessors for neuroscience, data acquisition and analysis systems. Lectures cover electrical activity of single nerve cells, electrodes and instrumentation techniques, analysis of electrophysiological data, and coding principles in the nervous system. Laboratory exercises provide experience in the analysis of biological signals.

433 Introduction to Analog and Digital Signal Processing
Fall. 3 credits (4 with lab). Prerequisite: EE 301.

442 Fundamentals of Acoustics (also T&AM 666) Spring. 3 credits. 3 lecs, biweekly lab. See T&AM 666 for course description.

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. 3. Linke Engineering principles underlying operation of modern electric-power systems under steady-state and transient conditions emphasizing major power-system components and computer-aided design of electric-power systems: load-flow, fault, stability, and economic-dispatch studies. At the level of Elements of Power System Analysis (fourth ed.), by Stevenson.

475 Computer Structures Fall. 4 credits. Prerequisite: EE 230. 3 lecs, 1 lab, N. M. Vrana Organization and design of digital computers. Hardware and microprogrammed control sequences, 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 475. 3 lecs, 1 lab, N. 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 NS&E 484) Spring. 3 credits. Prerequisites: EE 301 and 303 or permission of instructor. Intended for seniors and graduate students. 2 lecs, 1 lab, 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 worldwide since the early 1970s. Both magnetic and inertial confinement fusion are discussed, and comparisons are made between fusion and fission.

491-492 Senior Project 491, fall, 492, spring. 3 credits Individual study, analysis, and, usually, experimental tests in connection with a special engineering problem chosen by the student after consultation with the faculty member directing the project. An engineering report on the project is required.


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 non-resonant absorption; the 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 lab, J. Zemel. 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 I 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; non-linear resistance amplifiers; oscillator load characteristics; locking and stabilization; microwave amplifiers; intermodulation effects; microwave filters; noise temperature; noise figure. Laboratory makes use of Hewlett-Packard Network Analyzers and other microwave equipment.

534 Solid-State Microwave Devices and Circuits II Spring. 3 credits. Prerequisite: EE 533. 2 lecs, 1 lab. Basic studies of solid-state devices at microwave frequencies. Specific devices studied: varactors, avalanche diodes, transferred electron 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 Hewlett-Packard Network Analyzers and other microwave equipment.

538 VLSI Technology Spring. 4 credits. Prerequisite: EE 435 or permission of instructor. 2 lecs, 1 lab, P. Kuzius Integrated-circuit, especially VLSI, technology for solid-state circuits in the fields of computer hardware, telecommunication systems, and opto-electronics, with emphasis on processing, device design, and logic-gate design. Lithography, crystal growth, diffusion, ion implantation, oxidation, chemical-vapor deposition, evaporation, sputtering, molecular-beam epitaxy, etching, and in-process measurements. Process, device, and circuit design techniques. Emphasis on MOS and bipolar devices and circuits. Standard processes, device and logic-gate design. Systems on chip. At the level of current papers in IEEE Transactions on Electron Devices.

555 Advanced Power Systems Analysis I Fall. 3 credits. Prerequisites: EE 302 and concurrent registration in 451, or permission of instructor. Analysis of power-system components. These components include rotating machines and systems for excitation control, automatic voltage regulation, boiler-turbine control, and speed regulation, as well as ancillary three-phase networks. Emphasis on derivation of mathematical models from first principles, development of algorithms for the formulation of applicable network matrices.

556 Advanced Power Systems Analysis II Spring. 3 credits. Prerequisite: EE 555 or permission of instructor. Computer methods in power systems applied to short-circuit studies, load-flow studies, transient stability studies, economic dispatch, and security load flows. Use of sparse-matrix techniques. Comparison of algorithms for digital relaying. State-estimation algorithms. Emphasis on the use of the digital computer in the planning and operation of large-scale power systems. At the level of Computer Methods in Power System Analysis, by Stagg and El-Abed.

561 Error-Correcting Codes Fall. 3 credits. Prerequisite: Linear algebra. An introduction to the theory 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 sphere packing and the Singleton bound for error-correcting codes. Algebra: groups, rings, and fields with special emphasis on Galois fields. Finite-field construction and decoding of Bose-Fay-Chaudhuri-Hocquenghem (BCH) and Reed-Solomon (RS) codes. Burst error-correcting and concatenated codes.

562 Fundamental Information Theory Spring 3 or 4 credits (with lab). Prerequisite: EE 310 or equivalent. Prerequisite for lab only: EE 561 with lab. 2 lecs, 1 lab, R. Kubo. Fundamental results of information theory with application to storage, compression, and transmission of data. Entropy and other information measures. Block and variable-length codes, channel capacity and rate-distortion functions. Coding theorems and converses for classical and multiterminal configurations. Gaussian sources and channels. Laboratory projects investigate problems of statistical characterization of sources and channels using computer simulation.


567 Communication Systems I Fall 4 credits. Prerequisite: EE 310 or equivalent. Analog and digital signal representation, spectral analysis, linear-system processing, modulation and demodulation systems. Time- and frequency-division multiplex systems. Introduction to random processes 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). Spread spectrum such as direct sequence, frequency shift keying (FSK), maximum-aperiodic (MAP) and maximum-likelihood (ML) receivers, probability of error, symbol-liming and carrier-tracking loops. Computer 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: EE 577 or permission of instructor. 3 lecs, 1 lab. C. R. Johnson. 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-positional and speed-control systems; and computer-aided design techniques. Laboratory emphasis is on correlation of theoretical and experimental results.

572 Digital Control Systems  Spring. 3 credits (4 with lab). Prerequisite: EE 571 or permission of instructor. 3 lecs, 1 lab. C. R. Johnson. Analysis and design of feedback control systems using digital devices to implement compensation, Z-transforms, digital equivalent, root-locus, PID, deadbeat, and state-variable techniques will be used. Quantization and sample-rate effects in sampled-data systems 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 with extensive use of the APL language. Approximation on discrete point sets. The principle of optimality, Kalman filtering. Stochastic optimal control.

574 Optimal Control and Estimation for Continuous Systems  Spring. 4 credits. Prerequisite: EE 573 or permission of instructor. 3 lecs. Control system design through parameter optimization, with and without constraints. The minimum principle, linear regulations, minimum-time and minimal-fuel problems. Computational techniques, properties of Lyapunov and Riccati equations.

575 Parallel Processing  Spring. 3 credits. Prerequisite: EE 577 or permission of instructor. 3 lecs. Computer architectures and 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.

576 Computer Processor Organization and Memory Hierarchy  Fall. 4 credits. Prerequisites: EE 476 and 310, or permission of instructor. 4 lecs. H. C. Torng. 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, pipeline and parallel processing, architectures, interlocked memories, cache and virtual memories, I/O processors, vector and array processors, and protection mechanisms.

578 Computer Networks and Distributed Architecture  Spring. 4 credits. Prerequisite: EE 577 or permission of instructor. 4 lecs. H. C. Torng. Methods and approaches to distributed processing, carrier-sensing multiple-access schemes with collision detection, token-access rings, local-area networks, packet switches, wide-area networks, computer-communication protocols.

581 Introduction to Plasma Physics (also A&EP 650)  Fall. 4 credits. First-year graduate-level course; open also to exceptional fourth-year students at discretion of instructor. Prerequisites: EE 303 and 304 or equivalent. 4 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 microinstabilities; theory of particle in a plasma, elementary applications.

582 Advanced Plasma Physics (also A&EP 607)  Spring. 4 credits. Prerequisite: EE 581. 4 lecs. 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.

583 Electrodynamics  Fall. 4 credits. Prerequisite: EE 304 or equivalent. 3 lecs. Maxwell's equations, electromagnetic potentials, solution of Laplace and Poisson equations, Green's functions. Special theory of relativity, covariant formulation of Maxwell's equations, Lenard-Wiechert potentials, radiation from accelerated charges, Cerenkov radiation. Electrodynamics of dispersive media. At the level of Classical Electrodynamics, by Jackson.


585-586 Upper Atmosphere Physics I and II  Fall. 585: 586. Spring. 3 credits each term. 3 lecs. Physical processes in the earth's ionosphere and magnetosphere, the solar corona, and the solar wind. Diagnostic techniques including radar and in situ observations: production, loss, and transport of charged particles in the ionosphere and magnetosphere; airflow; tides, winds, and gravity waves; electric fields generated by the solar wind and winds in the neutral atmosphere; and their effects on transport processes; the equatorial auroral electrojets; instabilities in space plasmas, structure of the solar corona and solar wind and their interaction with the magnetosphere, acceleration and drift of energetic particles in the magnetosphere, precipitation of particles and the aurora; magnetic and ionospheric storms.

587 Electromagnetic Wave Propagation I  Fall. 3 credits. Prerequisite: EE 304 or equivalent. Not offered 1983-84. 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, and hybrid waves, the CMA diagram; WKB solutions of the coupled wave equations.

588 Electromagnetic Wave Propagation II 3 credits. Prerequisite: EE 587. 3 lecs. Full-wave solutions of the wave equations; interactions between particles and waves; scattering of radio waves by irregular atmospheric perturbations in refractive index, scatter propagation, incoherent scatter from the ionosphere and its use as a diagnostic tool; radio-star and satellite scintillations and their use as diagnostic tools; radar astronomy.

589 Magnetohydrodynamics  Spring. 3 credits. Prerequisite: EE 581 or equivalent. Offered alternate years. C. E. Seyler. The theory of ideal and resistive magnetohydrodynamical equations with emphasis on application to controlled thermonuclear fusion. Topics: derivation and domain of applicability, invariants, waves, and characteristics, static and stationary equilibrium, Grad-Shafranov equation; magnetic islands and 3-D equations; linearized equations and normal-mode stability analysis, energy-principle and variational techniques; continuous spectrum, sharp-boundary model, cylindrical and toroidal confinement geometries; stability conditions, resistive effects. At the level of MHD Instabilities, by G. Bateman.

591-599 Graduate Topics in Electrical Engineering 1-3 credits. Seminar, reading course, or other special arrangement agreed upon between the students and faculty members concerned.

633 Opto-Electronic Devices  Fall. 4 credits. Prerequisites: EE 304 and 435 or equivalent. Not offered 1983-84. 3 lecs, 1 rec. An understanding of physical properties of solids that affect use in optical devices is sought. Wave propagation in lossy, anisotropic, layered, and electro-optic media; microscopic and band-theoretic models, electro-optic and photoconductive devices; transport, scattering, and trapping, photoductivity; electro-optics, photomissive, and photoductive devices; noise in optical detectors.

634 Theory and Applications of Nonlinear Optics 4 credits. Prerequisite: EE 531 or 633 or equivalent of Physics 572. Not offered 1983-84. 3 lecs, 1 rec. Basic concepts and recent developments in nonlinear and electro-optics. Topics include higher-order perturbation theory of the Schrödinger and density-matrix equations and their applications in nonlinear optics, classical anharmonic oscillators, nonlinear optical properties of organic and inorganic crystals and semiconductors; harmonic generation and multiphoton processes; nonlinear and electro-optical devices and their applications in, for example, spectroscopy and optical communications. At the level of Rabin and Tang and current literature.

635 Solid-State Devices I  Fall. 4 credits. Prerequisite: EE 436 or equivalent. Not offered 1983-84. 3 lecs. Band structure, generation-recombination statistics, ambipolar transport, deep-level spectroscopy, p-n junction analysis, contact technology, secondary ionization, and noise. A review of ion-implantation technology with emphasis on associated material and device problems. Topics are presented on the level of current literature on device research. Presentation concentrates on relating basic material properties to device parameters. Term paper.

636 Solid-State Devices II  Spring. 4 credits. Prerequisite: EE 635 or equivalent. Not offered 1983-84. 3 lecs. A general treatment of the time dependence of secondary ionization and the simpler "quasistatic" approximation. Applications to microwave generation and amplification and band-gap and optical device technology, including stability, nonlinearity, and noise. The fundamentals of transferred electron devices, including band structure, distribution function, stability, and doping configurations of devices. Term paper.

638 Materials and Device Physics for VLSI 2-3 credits. Prerequisite: EE 436 or equivalent. J. Frey. 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. Submicron-scale phenomena in MOSFETs and bipolar devices; implications for circuit design.

639 VLSI Digital-System Design Fall. 4 credits. Prerequisites: EE 435 and 476 or equivalent. The foundations and current state of VLSI system design and implementation; examples of LSI system design and topics of current research relating to system timing, arrays of extensive LSI devices, algorithms consistent with LSI architectural arrays, and organization of hierarchical and concurrent computing devices. VLSI realization: MOS devices and circuits, chip real estate, cell layout, chip input-output circuitry, fabrication, packaging, and testing. A laboratory project is required.

681-682 Random Processes in Electrical Systems 681. Fall, 682. Spring. 4 credits each term. Prerequisites: EE 302 and 310. 3 lecs.

683 Advanced Topics in Information Theory Fall. 4 credits. Prerequisites: EE 562 and either EE 661 or Mathematics 571 or permission of instructor. 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, multimodal communication networks, ergodic theory and information, complexity and instrumentality of coding schemes, coding for computer memory.

684 Foundations of Inference and Decision Making Spring. 3 credits. Prerequisite: A course in probability and some statistics, or permission of instructor. 3 lecs.
An examination of methods for characterizing uncertainty and chance phenomena and for transforming information into decisions and optimal systems. Discussion of the foundations of inference include topics from the following areas: subjective probability, non-parametric statistics, decision theory (Bayesian and non-Bayesian), robust statistics, and the philosophy of science.

674 Adaptive Parameter Estimation Spring. 3 credits. Prerequisites: EE 426 and 572, or permission of instructor. 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.


691-692 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 important current topics in the field. Report required.

693-694 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.

695-696 Graduate Topics in Electrical Engineering 1-3 credits. Seminar, reading course, or other special arrangements. 1 lec. J. L. Cisne and staff.

791-792 Thesis Research 791, fall; 792, spring. 1-15 credits. For students enrolled in the master's or doctoral program.

Geological Sciences

Freshman and Sophomore Courses

101 Introductory Geological Sciences (also Engr 118) Fall, spring. 3 credits. 2 lecs, 1 lab. Field trips. Evening exams. W. B. Travers, fall; A. L. Bloom, spring. Understanding the natural earth; weathering, erosion, the evolution of coastlines and river valleys, glaciation, the origins of mountains and mountains, the genesis of volcanoes, and the drifting of continents. Studies of groundwater, mineral deposits, petroleum, and coal. Recognizing major minerals and rocks, interpretation of topographic and geologic maps.

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.

[103 Earth Science Laboratory Fall. 3 credits. To be taken concurrently with Geol 105, Earth Science Laboratory. Not offered 1983-84. 3 lecs. A. L. Bloom. Physical geography, including earth and lunar orbits that determine seasons and tides. Figure and structure of the earth; climatic regions; atmospheric and oceanic circulation; erosion by rivers, glaciers, wind, and waves; climatic change.]


107 Frontiers of Geology I Fall. 1 credit. May be taken concurrently with or after Geol 101. 1 lec. J. L. Cisne and staff.

Lectures by members of the department on selected fundamental topics of current interest, such as continental drift and related tectonic processes, volcanoes, earthquake prediction, natural energy resources, and mineral resources.

108 Frontiers of Geology II Spring. 1 credit. May be taken concurrently with or after Geo 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.

[131 Geology and the Environment Fall. 3 credits. Field trips. Not offered 1983-84 2 lecs, 1 lab. The principles of geological science, with emphasis on the physical phenomena and rock properties as they influence the natural environments of man.]

210 Introduction to Methods in Geological Sciences Fall. 2 credits. Prerequisite: Geol 101 or coregistration. Field trips. O. E. Karig and staff.

An introduction to the methods by which rocks are used as a geological database. Students will be familiarized with such field methods as use of brunt compass, construction of geologic maps and sections from field data, and description of strata. Meetings will be held on Saturday mornings. All work will be done in the Ithaca area with the exception of one more-distant weekend field trip.

262 Mineral and Energy Resources and the Environment Spring. 3 credits. No prerequisites. Offered alternate years. 2 lecs, 1 lab. A. K. Gibbs. 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 to be taken with any other course in geology or economics; instead, the focus is on a few exemplary problems and commodities.

Junior, Senior, and Graduate Courses

Of the following, the core courses Geol 325, 355, 356 (or 358), 376, and 388 may be taken by those who have successfully completed Geol 101-102 or the equivalent or who can demonstrate to the instructor that they have adequate preparation in mathematics, physics, chemistry, biology, or engineering.

325 Structural Geology and Sedimentation Spring. 4 credits. Prerequisite: Geol 101 or permission of instructor. 3 lecs, 1 lab. W. B. Travers. Nature, origin, and recognition of geologic structures. Behavior of geologic materials. Geomechanical and tectonic principles applied to the solution of geologic problems.
345 Geomorphology  Fall. 4 credits. Prerequisite: Geol 102 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 permission of instructor.
2 lecs, 2 labs, assigned problems and readings. W. A. Bassett.
Examination of minerals by hand-specimen properties and optical microscopy. Geological setting, classification, crystal structures, phase relations, chemical properties, and physical properties of minerals are studied. X-ray diffraction is introduced.

356 Petrology and Geochemistry  Spring. 4 credits. Prerequisite: Geol 355.
2 lecs, 2 labs, 1 field trip, assigned problems and readings. R. W. Kay.
Principles of phase equilibrium as applied to igneous and metamorphic systems. Description, classification, chemistry, and distribution, and dating of igneous and metamorphic rocks. Geochemical distribution of trace elements and isotopes in igneous and metamorphic rocks. Geochemical and metamorphic systems. Description, classification, minerals are studied. X-ray diffraction is introduced.

424 Tectonics of Orogenic Zones, Modern and Ancient  Spring. 3 credits. Prerequisite: permission of instructors. Offered alternate years. Not offered 1983-84.
1 lec. E. Karig, W. B. Travers.
A comparative study of island arcs and mountain ranges.

428 Geomechanics  Spring. 3 credits. Prerequisites: Mathematics 192, Geol 101.
3 lecs. D. L. Turcotte.
Use of mathematical analysis to explain such geological observations as ocean ridges—their plate tectonic setting, ocean trenches—the structure and mechanics of the bending lithosphere, folding-buckling, viscous and plastic flow, faulting—a detailed mechanical and geologic study of the San Andreas fault; intrusive—geothermal power.

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. Radiotopic considerations. The nature of the crust—mantle boundary. Thermal and rheological structure of the crust. Oceanic vs. continental crust. Origin and evolution of oceanic and continental crust.

432 Digital Processing and Analysis of Geophysical Data  Spring. 3 credits. Prerequisites: Geol 488 and familiarity with a programming language.
3 lecs. L. D. Brown.

433 Interpretation of Seismic Reflection Data  Spring. 3 credits. Prerequisite: Geol 488 or equivalent.
2 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. Seismic approaches to interpretation. Seismic stratigraphy.

454 Modern Petrology  Fall 3 credits. Prerequisite: Geol 356. Offered alternate years.
2 1/2 lecs, 1/2 lab. R. W. Kay.
Magma and metamorphism in the context of plate tectonics. Major and trace element chemistry and phase petrology as monitors of the creation and modification of igneous rocks. Temperature and stress in the crust and mantle and their influence on reaction rates and textures of metamorphic rocks. Application of experimental studies to natural systems. Reading from the literature and petrographic examination of pertinent examples.

455 Isotope Geology  Fall. 3 credits. Prerequisite: Geol 355-356 or equivalent. Not offered 1983-84.
3 lecs. R. W. Kay.

456 Chemical Geology  Spring. 3 credits. Prerequisite: Geol 355-356 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 equilibrium and disequilibrium processes of geologic interest. Topics include crystal symmetry, mineral structures, X-ray diffraction, mineral equilibria, 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. 4 credits. Prerequisite: Geol 461 or permission of instructor. Offered alternate years. Not offered 1983-84.
3 lecs, field trip. A. K. Gibbs.
Exploration geochemistry, geophysics, and geology; design of exploration programs; topics in economic geology.

472 Paleobiology  Spring. 4 credits. Prerequisites: Biological Sciences 101-102 and 103-104 or equivalent, and either Geol 376, Biological Sciences 212 or 274, or permission of instructor.
2 lecs, 1 disc. S. B. Bachman.
Interaction of sedimentation and tectonics in development of stratigraphic sequences. Framework of deep ocean, active margin, passive margin, and cratonic sedimentation and stratigraphy. Seismic stratigraphy, and the effects of sea-level changes on the stratigraphic record; sedimentary petrology and tectonism. Examples of margin and cratonic development throughout the geologic record. Problems with applying plate tectonic models to very old rocks.

483 Marine Tectonics  Fall. 3 credits. Prerequisites: Geol 325 and a course in physics or geophysics.
2 lecs, possible field trips. D. E. Karig.
Study of geophysical and geological characteristics of the earth's crust beneath the oceans. Review of the strengths and limitations of marine exploratory techniques. Emphasis on recent geologic data concerning plate margins in the ocean, especially the island arc systems.

485 Physics of the Earth I  Fall. 3 credits. Limited to upperclass engineers; majors in the physical sciences, and others by permission of instructor. Not offered 1983-84.
2 lecs, 1 lab. D. L. Turcotte.
Rotation and figure of the earth, gravitational field, seismology, geomagnetism, creep and anelasticity, radioactivity, earth's internal heat, continental drift, and mantle convection.

488 Geophysical Prospecting  Fall. 3 credits. Prerequisites: Physics 112 and 213 and Mathematics 191-192, or equivalents, or permission of instructor.
2 lecs. S. Kaufman.
Physical principles, instrumentation, operational procedures, and interpretation techniques in geophysical exploration for oil, gas, and minerals. Seismic reflection, seismic refraction, gravity, and magnetic and electrical methods of exploration.

489 Earthquakes and Tectonics  Fall. 3 credits. Prerequisite: introduction to geology, physics, calculus, or permission of instructor. Offered alternate years. Not offered 1983-84.
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 adviser during the junior year. Participation requires acceptance of a thesis proposal by the faculty committee.

608 Advanced Topics in Structural Geology
Spring. 3 credits. Prerequisites: Geol 325 and Math 298 or equivalent, or permission of instructor.
One or several topics in structural geology considered in greater depth than in Geol 325. Topics include thrust fault systems—geometries, distribution of deformation, and quantitative models; mechanics of deformation in sediments; transport and assembly processes for displaced terranes; and micro-fabric analysis. The format will mix lecture and seminar; the approach will be observational, experimental and/or analytical, as appropriate to the topic.

610-639 Seminars and Special Work
Fall and spring. 2 or 3 credits each term. Prerequisite: permission of instructor.
Advanced work on original investigations in geological sciences. Topics change from term to term.

610 Tectonic and Stratigraphic Evolution of Sedimentary Basins
W. B. Travers.

611 Petrology and Geochemistry
R. W. Kay.

612 Advanced Geomorphology Topics
A. L. Bloom.

613 Marine Geology
D. E. Karig.

614 Advanced Topics in Sedimentology and Stratigraphy
S. B. Bachman.

615 Topics in Mineral Resource Studies and Precambrian Geology
A. K. Gibbs.

616 Plate Tectonics and Geology
J. M. Bird.

617 Paleobiology
J. L. Casne.

618 Geophysics, Exploration Seismology
L. D. Brown.

619 Earthquakes and Tectonics
B. L. Isacks.

620 Exploration Seismology, Gravity, Magnetics
S. Kaufman.

621 Geophysics, Seismology, and Geotectonics
J. E. Oliver.

623 Mineralogy and Crystallography, X-Ray Diffraction, Microscopy, High-Pressure/ Temperature Experiments
W. A. Bassett.

629 Geology of Orogenic Belts
Fall. 4 credits. Prerequisite: permission of instructor. Offered alternate years. Not offered 1983-84. 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 681.

631 Research on Seismic-Reflection Profiling of the Continental Crust
J. E. Oliver, L. D. Brown, S. Kaufman.

633 Advanced Topics in Petrology and Tectonics I
J. M. Bird, W. A. Bassett.

634 Advanced Topics in Petrology and Tectonics II
J. M. Bird, W. A. Bassett.

635 Seminar in Tectonics
D. E. Karig, S. B. Bachman.

636 Seminar in Rock and Sediment Deformation
D. E. Karig.

637 Seminar in Petrology and Geochemistry
R. W. Kay.

639 Seismic Record Reading
B. L. Isacks.

642 Glacial and Quaternary Geology
Spring. 3 credits. Prerequisite: Geol 345 or permission of instructor.
2 lecs. 1 lab; several field trips. A. L. Bloom.
Glacial processes and deposits and the stratigraphy of the Quaternary.

681 Geotectonics
Fall. 4 credits. Prerequisite: permission of instructor. Offered alternate years.
Theories of orogeny; ocean and continent evolution.

685 Advanced Geophysics I
Fall. 3 credits. Prerequisite: Geol 388. Not offered 1983-84.
3 lecs. D. L. Turcotte.
Analytic convection; heat flow, the driving mechanism for plate tectonics; the energy balance, definition of the lithosphere.

686 Advanced Geophysics II
Spring. 3 credits. Prerequisite: Geol 388. Not offered 1983-84.
3 lecs. D. L. Turcotte.
Gravity, figure of the earth, tides, magnetism, mechanical behavior of the lithosphere, changes in sea level.

687 Seismology I
Fall. 3 credits. Prerequisite: TAM 611 or equivalent. Offered alternate years.
3 lec-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.

Field Courses

401 Field Geology
Summer. 6 credits.
Prerequisites: Geol 325 or permission of instructor.
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.

601 Intersession Field Trip January intersession. 1 credit. Prerequisites: Geol 101-102 or equivalent and permission of instructor. Travel and subsistence expenses to be announced. Not offered 1983-84.
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.

604 Western Adirondack Field Course
Spring. one week at the end of the semester. 1 credit. Students should be prepared for overnight camping and will have to pay for their own meals.
W. A. Bassett.
Field mapping methods; mineral and rock identification, examination of Precambrian metamorphic rocks and lower Paleozoic sediments, talc and zinc mines.

704 Western Field Course
Spring. 6 credits. Prerequisites: four courses in geological sciences at the 300 level and permission of instructor. Students should be prepared for overnight camping and will have to pay for their own meals. Not offered 1983-84. Weekly rec and 35-day trip to California, Nevada, and Utah. Staff.
A comparative study of California Coast Range, Sierra Nevada, Basin and Range of Nevada, and Uinta Mountains, Utah. Pretrip seminars and extensive reading at Cornell. Study of Mesozoic ophiolites, and subduction near San Luis Obispo, California; recent earth movements along the San Andreas Fault near San Francisco; granitic pluton emplacement and volcanism in the northern Sierra Nevada; multiple-phase mountain building near Dixie Valley, Nevada; sedimentology and block faulting of the Uinta Mountains, Utah. Five-day raft trip on the Green River through the core of the Uinta mountains. Visit to an oil field in California and a mine in Nevada. Lectures and field trips with local experts.

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. Structure and transitions of amorphous and partially ordered materials. Techniques for materials analysis: X-ray and electron diffraction, optical and electron microscopy. Implications for the design of materials with useful engineering properties.
322 Electrical and Magnetic Properties of Materials Spring. 3 credits. 3 lecs.

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. 3 lecs.
The three laws of thermodynamics are introduced as a basis for understanding phase equilibria and heterogeneous reactions, solutions, electrochemical processes, surfaces, and defects. Examples of design and control of materials processing and microstructure are discussed.

336 Kinetics, Diffusion, and Phase Transformations Spring. 3 credits. 3 lecs.
Introduction of absolute rate theory, atomic motion, and diffusion. Applications to nucleation and growth of new phases in vapors, liquids, and solids; solidification, crystal growth, oxidation and corrosion, radiation damage, recrystallization, gas-metal reactions, and thermomechanical processing to produce desired microstructures and properties.

345 Materials and Manufacturing Processes (also M&A&E 311) Fall. 3 credits. May be taken in addition to MS&E 261. Prerequisite: T&M&E 202 or permission of instructor. 2 lecs., 1 lab. For description see M&A&E 311.

441 Microprocessing of Materials Fall. 3 credits. 3 lecs., occasional lab.
Introduction to engineering and design of large-scale integrated circuits. All major processing steps involved in fabrication are considered. Metalurgical processes for winning high-purity silicon from SiO2. Single-crystal growth, zone melting and zone refining, Burton-Prim-Shlicter theory of the effective distribution coefficient, epitaxial growth of silicon. Thermal oxidation of silicon to form SiO2. Mathematical models of solid-state diffusion with specific application to the doping of silicon to form integrated circuit devices: e.g., resistors, diodes, and bipolar transistors. Diffusion of diffused layers by electrical measurements. Linhard-Scharff-Schott theory of ion implantation, stopping power, electronic and nuclear energy-loss mechanisms, range and damage profiles. Application of ion implantation to the fabrication of integrated circuits (metal-oxide-semiconductor field-effect transistor). Etching, metallization, photoreists, metal-semiconductor contacts, failure due to electromigration effects.

442 Macroprocessing Spring. 3 credits. 3 lecs.
Deforination processing of materials, including superplastic forming, sheet-metal forming, massive forming, and powder processing. Time, temperature, and strain-rate effects in warm-forming and hot-forming. Characterization of powder-compaction mechanisms and their use in process design. Forming-limit diagrams. Development of microstructure-based criteria for fracture in large deformations. Optimization and design of forming processes. Development of constitutive equations for superplastic flow. Design of a superplastic forming process starting from basic mechanisms. The course includes a comprehensive experimental project in which the constitutive equations for superplastic flow are measured, and computer-aided techniques are used to design a superplastic forming process. The forming experiment is carried out and the results are compared with the predictions from the numerical analysis.

443-444 Senior Materials Laboratory Fall. 3 credits. Prerequisite: MS&E 261. Prerequisite: MS&E 261. Projects are available in plasticity of metals and ceramics, mechanical and chemical processing, phase transformations, electrical and ionic conductivity, analysis of defects by electron microscopy, sintering, crystal growth, etc. Emphasis is placed on analysis and evaluation of a material's properties and performance in terms of its processing history and microstructure.

445 Mechanical Properties of Materials Fall. 3 credits. 3 lecs.
Relation between stress, strain, concept of equivalent stresses and strains, failure criteria for metals, polymers, and ceramics. Applications of fracture mechanics to fail-safe design. Analysis of important mechanical properties such as plastic flow, creep, fatigue, fracture toughness, and rupture, and their variation with temperature in terms of the interaction of the microstructure with lattice defects. Application of these principles to the design of improved materials.

446 Current Topics in Materials Spring. 3 credits. 3 lecs.
Speakers from industry and other institutions will give case studies of design problems. Each student is expected to research and write an extensive term paper and give a fifty-minute talk on a materials-design problem involving economic factors.

447 Introduction to Ceramics Fall. 3 credits. Prerequisite: MS&E 261 or permission of instructor. Offered alternate years. 3 lecs.
Engineering applications of ceramic materials and processes. Crystal structure and ionic bonding of ceramic materials; structure of glasses; point defects, point-defect chemistry and relation to nonstoichiometry; line defects and grain boundaries; diffusion in stoichiometric and nonstoichiometric oxides; phase diagrams; phase transformations and the design of glass-ceramics; grain growth and sintering.

448 Properties of Solid Polymers Spring. 3 credits. 3 lecs.

450 Physical Metalurgy Spring. 3 credits. 3 lecs.
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.

452 Processing of Glass, Ceramic, and Glass-Ceramic Materials Spring. 3 credits. Offered alternate years. Conventional and unconventional techniques for processing glass, glass-ceramic, and ceramic materials. Case studies illustrate the design, engineering, and scientific aspects of such processes. Vapor processes for high-purity optical fibers, hot-processing of ceramic turbine blades, photosensitive materials, and powder processing and sintering of ceramics will be discussed. This course is taught with two scientists from the research and development laboratory of Corning Glass Works.

455 Analysis of Manufacturing Processes (also M&A&E 512) Spring. 3 credits. Prerequisite: M&A&E 311. 3 lecs.
For description see M&A&E 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 Auger electron spectroscopy, ion scattering, and secondary ion mass spectrometry.

Graduate-Level Professional Courses

553-554 Special Project 553, fall, 554, spring. 6 credits each term. Research on a specific problem in the materials area.

Graduate Core Courses


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 representations of elasticity and other irreversible 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 Nyce.

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 rearrangement of amorphous materials. Observation of defects in crystalline materials. Statistical 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 and practice of mechanical testing, 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


612 Phase Transformations 3 credits Prerequisite: MS&E 601 and 603 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 other 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 Jaffee; and current review articles.


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: structure of liquids and polymers; rheology of elastomers and glasses; electrical, thermal, and optical properties of amorphous materials. Presented at the level of Modern Aspects of the Vitreous State, by Mackenzie; "Glass Transitions," by Shen and Eisenberg in Progress in Solid State Chemistry; and The Physics of Rubber Elasticity, by Treloar.

703 Solid Surfaces and Interfaces 3 credits. Prerequisites: MS&E 601 and some knowledge of solid-state physics. Similar to A&E 762. Offered alternate years. Not offered 1983-84. Topics to be covered include atomic structure of surfaces; surface statistical thermodynamics, interaction of surfaces with gases, defects at surfaces, surfaces of alloys, semiconductor and insulator interfaces, heterogeneous catalysis, mass transport, oxidation of crystals.

704 Advanced Topics in Crystal Defects 3 credits. Prerequisites: MS&E 601, 602, and 604, or equivalent. The structure and properties of point, line, and planar crystal defects treated from a fundamental point of view. Thermodynamics and kinetics of point defects. Atomic 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 and nuclear defects; sputtering of single and polycrystalline metals; recovery mechanisms for radiation damage; void formation in metals irradiated to high fluxes, and the problem of swelling in liquid-metal fast breeder reactors; the first-wall problem in controlled thermonuclear reactors. At the level of Defects and Radiation Damage in Metals, by M. W. Thompson, The Observation of Atomic Collisions in Crystalline Solids, by R. S. Nelson; Ion Bombardment of Solids, by G. Carter and J. S. Colligon; and selected papers and review articles.

706 Amorphous Semiconductors 2 credits Prerequisite: knowledge of the theory of crystalline semiconductors on the level of Kittel. The preparation, characterization, and electronic transport of amorphous semiconductors from an experimental point of view. Particular emphasis is given to amorphous, hydrogenated Si. Some potential device applications, such as in amorphous Si solar cells and the metal-base transistor, are described.

707 Solar Energy Materials 3 credits. 3 lecs. Photovoltaic energy conversion: (1) theory (on the level of Hovel); (2) the role of crystal defects and grain boundaries on the conversion efficiency, and schemes to passivate these defects. (3) current investigations in the JPL program to produce large quantities of solar-grade semiconducting Si.

708 Ceramic Materials 3 credits. Prerequisites: MS&E 601 and some familiarity with crystal structures. Crystal structure and bonding of typical ceramic materials; structure of silicate and nonasilicate glasses; imperfections in oxides; point defects and point-defect chemistry, line defects, extended defects; diffusion in stoichiometric and nonstoichiometric glasses; 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. Credit variable. 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 102) Spring. 3 credits. Limited to freshmen and sophomores. R. L. Wahe.

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.

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 191 and 192, Physics 112. Evening prelims. For description see Engineering Common Courses.

[302 Technology, Society, and the Human Environment Spring, summer: 3 credits. Limited to upperclass engineers and other students who have received permission of instructor. S-U grades optional. Approved social science elective. Not offered 1983-84.]

B. J. Conta.

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.

311 Materials and Manufacturing Processes (also MS&E 345) Fall, spring: may be offered in Engineering Cooperative Program. May be taken in addition to Engr 261. Enrollment limited to 80 students per term: upperclass mechanical and materials science students have priority. Prerequisite: Engr 202 or permission of instructor. Evening prelims may be given. 2 lecs, 1 lab. M. C. Leu.

Material structures. Physical and metallurgical properties of materials and their control by mechanical and metallurgical means. Manufacturing processes. Emphasis on correlations among design, material properties, and processing methods.

323 Introductory Fluid Mechanics Fall: usually offered in Engineering Cooperative Program. 4 credits. Prerequisites: Engr 202, 203, and 221, or permission of instructor. 4 recs. Evening prelims. Z. Warhaft.

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; supercritical flow; stability analysis. Short design problems.

324 Heat Transfer Fall, spring: not offered fall 1984, may be offered in Engineering Cooperative Program. Prerequisite: M&AE 323. 2 lecs, 1 rec. Evening prelims. D. L. Taylor.


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 Fall (seniors only), spring, not offered fall 1984, may be offered in Engineering Cooperative Program. 4 credits. Prerequisite: M&AE 325. Evening prelims. Dynamic behavior of mechanical systems, modeling, analysis techniques and applications, digital- and analog-computer simulation, and computer simulation of rotating and reciprocating machinery, vibrations of single and multi-degree-of-freedom systems, linear control systems. PDF control, stability analysis.

327 Mechanical Engineering Laboratory Fall 4 credits. Prerequisites: M&AE 323, 325, and concurrent registration in M&AE 324 and 326. 1 lec, 2 labs. R. L. Wehe, Jr., J. G. Shepherd, K. E. Torrance.

Laboratory exercises in instrumentation, techniques, and methods in mechanical engineering. Measurements of pressure, temperature, heat flow, drag, fluid-flow rate, solid fatigue, thermoelectricity, displacement force, stress, strain, vibrations, noise.

Mechanical Systems and Design and Manufacturing

464 Design for Manufacture Fall: 3 credits Prerequisites: M&AE 311 and 325, or permission of instructor. R. L. Wehe.

Design for casting, forging, stamping, welding, machining, heat treatment, and assembly; beneficial prestressing; improving the distribution of loads and deflections. Selection of materials; dimensioning and fits, joints, fasteners, and shaft mountings. Specific problems of manufacturing and maintenance to minimize fatigue failures and improve reliability. Short design problems.

483 Mechanical Reliability Fall: 3 credits. Prerequisites: Engr 260 or 270 or equivalent. S. L. Phoenix.

Classic system reliability, hazard-function concepts, reliability bounds; static and time-dependent material-strength analysis; structural system reliability, static and time-dependent parallel-member models. Monte Carlo simulation of structural systems with load sharing. Strength of composite materials.

486 Automotive Engineering Spring: 3 credits. Prerequisite: M&AE 325. R. L. Wehe.

Selected topics in the analysis and design of vehicle components and vehicle systems. Emphasis is on automobiles, trucks, and related vehicles. Powerplant, driveline, brakes, suspension, and structure. Other vehicle types may be considered.

489 Computer-aided Design Spring: 3 credits. Limited to juniors and seniors. 2 lecs-rec, 1 computing lab, term project. D. L. Taylor.

A broad introduction to computational methods in mechanical design. Problems with emphasis on interactive techniques.

512 Analysis of Manufacturing Processes (also MS&E 455) Spring: 3 credits. Prerequisite: M&AE 311. 3 lecs. P. R. Dawson.

Review of basic principles of plasticity with coverage of bound theorems and slip-line theory. Analytical treatment of metal-cutting and metal-forming processes; conventional and nontraditional manufacturing methods; production systems and machine tool dynamics.

513 Materials Engineering Spring, on demand. 3 credits. Prerequisite: M&AE 311, Engr 261, or permission of instructor. R. L. Wehe.

Design problems in the design, selection, and use of engineering materials. Theory and practice of extractive, physical, and mechanical metallurgy. Corrosion principles and control; metallurgical failure analysis and prevention; mechanical properties of polymers, ceramics, and composite materials.

514 Numerical Control In Manufacturing Fall: 3 credits. Prerequisite: upperclass standing in engineering. 3 lecs. K. K. Wang.

Principles and 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 Industrial Robots Spring: 3 credits. Enrollment limited; intended for graduate students, open to qualified undergraduates with permission of instructor. Prerequisite: background in vector calculus, rigid body dynamics, and feedback control. M. C. Leu.


[563 Mechanical Components Spring: 3 credits. Prerequisite: M&AE 325. Not offered 1983-84. Advanced analysis of mechanical components and designs. Analysis techniques and applications to the design of new configurations and devices. Selected topics from the following: lubrication theory and bearing design, fluid flow and heat transfer, chock valves, composite materials, elastic-plastic design, thermal stresses, creep, impact, indeterminate and curved beams, plates, contact stresses.]


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.]

599 Mechanical and Aerospace Structures I Fall: 3 credits. Prerequisite: M&AE 325 or permission of instructor. J. F. Booker.

A study of advanced topics in the analysis of stress and deformation of deformable bodies, with applications to the analysis and design of mechanical and aerospace systems. Topics selected from advanced strength of materials, energy methods in stress analysis, strength 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. 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 AIM-65 microcomputer and 6502 assembly language programming. Independent laboratory work on several applications projects, including the design of a digital voltmeter and stepper-motor control.

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 multi-degree-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, trailers, 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.

618 Finite-Element Methods in Thermomechanical Processes Spring. 4 credits. Prerequisite: introductory course work in finite, element methods and elasticity or in analysis of manufacturing processes. Not offered 1983-84.

P. R. Dawson.
Application of finite-element methods in the analyses of mechanical deformation processes that are nonlinear and influenced by coupling to thermal or electrical behavior. Elastic, elastoplastic, viscoplastic, and thermally coupled analyses applied to problems in large deformation, bulk forming, polymer flows, and welding.

670 Mechanical and Aerospace Structures II Spring. 4 credits. Prerequisite: M&AE 569 or permission of instructor.
P. R. Dawson.

672 Experimental Methods in Machine Design Fall, offered 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. Photelastic 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 Spring. 4 credits. Open to qualified undergraduates who have permission of instructor. Prerequisite: permission of instructor. Introduction to digital simulation techniques and digital programming. Offered alternate years.
J. F. Booker.

682 Hydrodynamic Lubrication: Fluid-Film Bearings Fall, on demand. 4 credits.
J. F. Booker.

[507 Dynamics of Flight Vehicles Spring. 3 credits. Prerequisites: M&AE 405 and Engr 203 or permission of instructor. Offered alternate years. Not offered 1983-84.
D. A. Caughey.

530 Fluid Dynamics Fall. 3 credits. Prerequisite: M&AE 323, senior or graduate standing, or permission of instructor.
F. K. Moore.
Inviscid fluid dynamics and aerodynamics, including incompressible and super sonic 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 problem formulation should be interested also. The courses may be taken independently or as a sequence.

531 Boundary Layers Fall. 3 credits. Prerequisite: M&AE 323, senior or graduate standing or permission of instructor. Recommended: M&AE 530 or equivalent.
Z. Warhaut.
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 320 or equivalent.
3 lecs. F. K. Moore.
Aerothermodynamic design of turbomachines in general, energy transfer between fluid and rotor in specific types, axial and radial devices, compressible flow. Three-dimensional effects, surging.

543 Combustion Processes Spring. 3 credits. Prerequisite: M&AE 323, 324
3 lecs. S. B. Pope.
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. Both premixed and diffusion flames are considered.

554 Solar Energy Fall. 3 credits. Prerequisite: Engr 221 or equivalent.
B. J. Conia.

555 Direct Energy Conversion and Storage Spring. on demand. 3 credits. Prerequisite: Engr 221 or equivalent. Not offered 1983-84.
3 lecs.

556 Power Systems Fall. 3 credits. Prerequisite: M&AE 323 or equivalent.
P. L. Auer.
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 NS&EE 484) Spring. 3 credits. Prerequisite: Physics 112, 213, and 214, or equivalent background in electricity and magnetism and mechanics, with permission of instructor. Intended for seniors and graduate students.


Introduction to the physical principles and technology underlying controlled fusion power. Topics include fundamental aspects of the physics of ionized gases at high temperature (thermonuclear plasmas), requirements for plasma achievement, and treatment 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.

601 Foundations of Fluid Dynamics and Aerodynamics Fall 4 credits. Prerequisite: graduate standing or permission of instructor.

J. L. Lumley.


602 Incompressible Aerodynamics Spring 4 credits. Prerequisite: M&AE 601 or equivalent. Open to qualified undergraduates with permission of instructor.

S. Leibovich.


603 Compressible Aerodynamics Fall 4 credits. Prerequisite: M&AE 601 or equivalent or permission of instructor.

S. Leibovich.


608 Physics of Fluids I Fall 4 credits.

P. C. T. de Boer.

Kinetic theory of gases: transport properties; derivation of the macroscopic equations of mass, momentum, and energy; flow of rarefied gases. Statistical mechanics of gases; methods of the most probable value, Darwin-Fowler method of mean values, law of mass action. Introduction to wave mechanics: harmonic oscillation, rigid rotor, one-electron atom, hydrogen wave equation, two-electron structure: building-up principle, Born-Oppenheimer approximation. Chemical reaction rate theory.

609 Physics of Fluids II Spring, on demand. 4 credits.


610 Gasdynamics Spring, on demand. 4 credits.

E. L. Weller, Jr.

A survey of the nonlinear theory of characteristics as applied to two-dimensional steady supersonic flows and one-dimensional unsteady flows. The role of chemical reactions in these flows is treated, as well as experimental techniques to measure chemical reaction rates. Among the topics treated are heat capacity lag and its effects on acoustics, gasdynamic lasers, and shock-tube techniques. Magneto-acoustics and magnetically driven shock waves are also covered.

630 Atmospheric Turbulence and Micrometeorology Spring 4 credits. Offered alternate years. Open to qualified undergraduates with permission of instructor. Not offered 1983-84.

Z. Warhaft.

Basic problems associated with our understanding of the structure of the velocity field and the transport of scalars such as temperature and moisture in the lower atmosphere, from both theoretical and experimental viewpoints. Topics include the second-order turbulence equations and their closure; Monin-Obukhov theory; diffusion of scalars, spectral characteristics of atmospheric variables; experimental techniques, including remote sensing; and the analysis of random-time series.

648 Seminar on Combustion Spring 4 credits. Prerequisite: permission of instructor. Offered alternate years. Not offered 1983-84.

3 recs.

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.

650 Transport Processes I Fall 4 credits. Prerequisite: graduate standing or permission of instructor. Not offered 1983-84.


651 Transport Processes II Spring 4 credits. Prerequisite: graduate standing or permission of instructor.

K. E. Torrance.


652 Boiling and Two-Phase Flow Spring 4 credits. Prerequisite: graduate standing or permission of instructor.

C. T. Avedisian.


653 Experimental Methods in Fluid Mechanics, Heat Transfer, and Combustion Fall 4 credits.

2 lecs. 1 lab. F. C. Gould.

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 FlowsFall, on demand. 4 credits. Prerequisite: M&AE 601 or permission of instructor.

S. F. Shen.

A systematic study of laminar flow phenomena (including compressibility and heat transfer) and methods of analysis. Exact solutions of the Navier-Stokes equations. Linearized problems; flow at small Reynolds numbers, laminar instability. The boundary-layer approximation, general properties. Transformations for compressibility and axisymmetric effects. Approximate methods of calculation. Separation and unsteady problems. Stability of laminar flows.

707 Aerodynamic Noise Theory Offered on demand. 4 credits. Prerequisite: M&AE 601 or permission of instructor.

S. B. Pope.

Study of methods for calculating the properties of turbulent flows. Characteristics of turbulent flows. Reynolds-stress equation; effects of dissipation, anisotropy, deformation. Transported scalars. Probability density function (pdf) definitions and properties, transport equations, relationship to second-order closures, Monte Carlo solutions. Additional topics depending on time available and students' interest: turbulent reactive flows, intermittency, two-point closures. The course emphasizes comparison of theory with experimental data.

733 Stability of Fluid Flow Offered on demand. 4 credits. Prerequisite: graduate standing or permission of instructor.

S. Leibovich.


734 Turbulence and Turbulent Flow Spring 4 credits. Prerequisite: M&AE 601 or permission of instructor. Not offered 1983-84.

Topics include the dynamics of buoyancy and shear-driven turbulence, boundary layers and shear flows, second-order modeling, the statistical description of turbulence, turbulent transport, and spectral dynamics.

735 Dynamics of Rotating Fluids Offered on demand. 4 credits. Prerequisite: M&AE 601 or permission of instructor.

A. Caughey.


736 Numerical Fluid Mechanics I Fall 4 credits. Prerequisites: graduate standing, an advanced course in continuum mechanics or fluid mechanics, and some FORTRAN programming experience.

D. A. Caughey.

for complex geometries. General procedures for solving the Euler equations, with a critical survey of current methods for problems of aerodynamic interest, including those that are dominantly hyperbolic (such as steady transonic flows). Assigned problems are solved with a digital computer.

737 Numerical Fluid Mechanics II
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.

738 Nonlinear Wave Propagation
Offered on demand. 4 credits. Prerequisite: M&AE 601 or permission of instructor.

S. Leibovich.
Mathematical treatment of nonlinear effects associated with waves in continua. Examples are taken primarily from geophysical fluid dynamics and gas dynamics. Methods of averaging, variational methods, wave interactions, and exact solutions of nonlinear evolution equations.

Special Offerings

393 Current Topics in Biomechanics
Fall, spring. No credit.
D. L. Bann.
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.
R. L. Wehe.
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.

695 Special Topics in Mechanical and Aerospace Engineering
Fall, spring. Credit to be arranged. Prerequisite: permission of instructor.
Lecture or seminar format. Topics of current importance in mechanical and aerospace engineering and research. More than one topic may be taken if offered.

791 Fluid Mechanics Research Conference
Fall, spring. 1 credit each term. For graduate students involved in research projects.
Short presentations on research in progress by faculty and students.

799 Mechanical and Aerospace Engineering Colloquium
Fall, spring. 1 credit each term. Credit limited to graduate students. All students and staff invited to attend.
Lectures by visiting scientists and Cornell faculty and staff members on research topics of current interest in mechanical and aerospace science, especially in connection with new research.

890 Research in Mechanical and Aerospace Engineering
Credit to be arranged. Prerequisite: candidacy for Ph.D. degree in mechanical or aerospace engineering, or approval of the director. Independent research in an area of mechanical and aerospace engineering under the guidance of a member of the staff.

990 Research in Mechanical and Aerospace Engineering
Credit to be arranged. Prerequisite: candidacy for M.S. degree in mechanical or aerospace engineering, or approval of the director. Independent research in an area of mechanical and aerospace engineering under the guidance of a member of the staff.

Nuclear Science and 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 Fusion, Fusion, and Radiation (also Engr 211)
Fall, spring. 3 credits.
2 lecs, 1 lab demonstration.
For description see Engineering Common Courses.

303 Introduction to Nuclear Science and Engineering I (also Engr 333)
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 also serves 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.
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 Lamarch.

304 Introduction to Nuclear Science and Engineering II (also NS&E 304)
Fall. 3 credits.
Prerequisite: NS&E 303.
3 lecs.
Introduction to aspects of nuclear reactor engineering and to controlled fusion. Topics include heat-transfer and safety problems in fission reactors; principles, configurations, and engineering problems of proposed fusion reactors; radiation detection, shielding, biological effects of radiation, and materials damage.

305 Introduction to Nuclear Science and Engineering III
Spring. 1 credit.
Prerequisite: NS&E 303.
1 lab.
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 303-304 for students who plan graduate work in nuclear science or engineering.

484 Introduction to Controlled Fusion: Principles and Technology (also EE 484 and M&A 559)
Spring. 3 credits.
Prerequisite: Physics 112, 213, and 214 or equivalent background in electricity and magnetism and mechanics, with permission of instructor. Intended for seniors and graduate students.
3 lecs.
Introduction to the physical principles and technology underlying controlled fusion power. Topics include fundamental aspects of the physics of ionized gases at high temperature (thermonuclear plasmas), requirements (in principle) for achievement of net power from fusion, technological problems of an actual fusion reactor, and progress of the fusion program toward overcoming these problems. Both magnetic and inertial confinement fusion are discussed, and comparisons are made between fusion and fission.

Operations Research and Industrial Engineering

115 Engineering Application of Operations Research (also Engr 115)
Fall, spring. 3 credits.
2 lecs, 1 lab.
For description see Engineering Common Courses.

119 Introduction to Manufacturing Engineering (also Engr 119)
Spring. 3 credits.
2 lecs, 1 lab.
For description see Engineering Common Courses.

120 Problem Solving and Modeling (also Engr 120)
3 credits. Not offered 1983-84.
For description see Engineering Common Courses.

260 Introductory Engineering Probability (also Engr 260)
Fall, spring. 3 credits.
Prerequisite: first-year calculus.
3 lecs.
For description see Engineering Common Courses.

270 Basic Engineering Probability and Statistics
Fall, spring. 3 credits.
Prerequisite: first-year calculus.
3 lecs.
For description see Engineering Common Courses.

320 Optimization I
Fall. 4 credits.
Prerequisite: Mathematics 293 or 221.
3 lecs, 1 rec.
Formulation of linear programming problems and solution by the simplex method. Related topics such as sensitivity analysis, duality, and network programming. Applications include such models as resource allocation and production planning.

321 Optimization II
Spring. 4 credits.
Prerequisite: OR&IE 302 or equivalent.
3 lecs, 1 rec.
A variety of optimization methods, stressing extensions of linear programming and its applications but also including topics drawn from integer, dynamic, and nonlinear programming. Formulation and modeling are stressed, as well as numerous applications. The computer is used in solving typical problems.

350 Cost Accounting, Analysis, and Control
Fall, spring. 4 credits.
3 lecs, 1 computing-disc.

Operations Research and Industrial Engineering
Principles of accounting, financial reports; job-order and process cost systems—historical, and standard costs, cost characteristics and concepts for control, analysis, and decision making.

410 Industrial Systems Analysis Spring. 3 credits. Prerequisite: OR&IE 260 or equivalent.
3 lecs, 1 rec.
A selection of topics from the following: manufacturing, 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. Sample size calculations for one- and two-sample tests; theory of multiple linear regression and applications to problems in engineering and the sciences, including graphical and analytic techniques useful in model building; analysis of data from experiments with qualitative factors, including one-way and two-way Anova models. Use of the computer as a tool for statistics is stressed.

472 Statistical Decision Theory Spring. 3 credits. Prerequisite: OR&IE 471 or equivalent.
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.
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 of oral and written reports.

516 Case Studies Fall. 4 credits. Only for M.Eng. students in OR&IE.
3 rec-labs.
Design of the layout of processes and storage areas and the material-handling system for movement of items. Typical equipment used. The functions of identification control, storage, movement, batching, merging, and dispensation. Introduction to new technologies.

551 Advanced Engineering Economic Analysis Spring. 4 credits. Prerequisites: OR&IE 350 and 360 or permission of instructor.
3 lecs, 1 rec.
The economics of production. Topics concerning economic decision making at the level of the firm include long-range planning, budgeting and control, and project investment decisions under certainty and uncertainty. Topics in industrial economics include productivity, technical change, and industrial development.

561 Queueing Theory and Its Applications Fall. 3 credits. Prerequisite: OR&IE 361 or permission of instructor. Not offered 1983-84.
3 lecs.

562 Inventory Theory Spring. 4 credits. Prerequisite: OR&IE 421 or permission of instructor.
3 lecs, 1 rec.
A survey of deterministic models. Models are drawn from linear, mixed-integer, nonlinear, and dynamic programming. Network theory, game theory, and deterministic inventory models. Modeling and applications are stressed.

580 Digital Systems Simulation Fall. 4 credits. Prerequisites: CS 211 and OR&IE 370 or permission of instructor.
3 lecs, 1 rec.
Digital computer programs to simulate the operation of complex discrete systems in time. Modeling, program organization, random number and data generation, simulation languages, statistical considerations, applications to a variety of problem areas.

622 Operations Research I Fall. 3 credits. Not open to students who have had OR&IE 320.
3 lec-recs.
Survey of deterministic models. Models are drawn from linear, mixed-integer, nonlinear, and dynamic programming. Network theory, game theory, and deterministic inventory models. Modeling and applications are stressed.

623 Operations Research II Spring. 3 credits. Not open to students who have had OR&IE 361.
Prerequisites: OR&IE 260 or 270 or permission of instructor.
3 lec-recs.
Models of inventory and production control. Markov decision models, queueing theory and its applications. Simulation, illustrative examples and problems.

625 Scheduling Theory Spring. 3 credits. Prerequisite: permission of instructor.
3 lecs.
Scheduling and sequencing problems. Single resource scheduling, parallel processing, flow shop scheduling. Methodology is drawn from dynamic and integer programming; simulation techniques and heuristic methods.

628 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.
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 optimas. Computational methods, including gradient methods, Newton's method, least-squares methods, and cutting plane methods. Maximum flow and minimum cost flow problems.

633 Graph Theory and Network Flows
Fall. 3 credits.
Prerequisite: permission of instructor.
3 lecs.

660 Applied Probability
Fall. 4 credits.
Prerequisite: advanced calculus.
3 lecs, 1 rec.
A study of multiple-decision problems in which a choice must be made among two or more courses of action. Emphasis is placed on selection and ranking problems; testing goodness of fit, analysis of incomplete tables; life tables; paired comparison methods. Applications.

661 Applied Stochastic Processes
Spring 4 credits.
Prerequisite: OR&IE 660 or equivalent.
3 lecs, 1 rec.
A study of stochastic processes arising in a class of traffic situations. Topics include renewal theory, random walks, branching processes, Brownian motion, stationary processes.

662 Advanced Stochastic Processes
Fall. 3 credits.
Prerequisite: OR&IE 661 or equivalent.
3 lecs, 1 rec.
An introduction to stochastic processes that present the basic theory together with a variety of applications. Topics include Markov processes, renewal theory, random walks, branching processes, Brownian motion, stationary processes.

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.
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 phenomenon, storage models, and environmental management are discussed.

665 Advanced Queueuing 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.

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 confidence regions; simultaneous inference. Applications to regression analysis and ANOVA models. Variance components and mixed models. Contrast, ridge regression. Use of the computer as a tool for statistical problems.

672 Statistical Decision Theory
Fall. 3 credits.
Prerequisite: OR&IE 471 or OR&IE 670 or equivalent.
Fall, offered 1983-84.
3 lecs.
The general problem of statistical decision theory and its applications. Decision rules; Bayes, admissible, and minimax rules. Problems involving sequences of decisions over time. Use of the sample cdf and other simple nonparametric methods.

673 Nonparametric Statistical Analysis
Spring. 3 credits.
Prerequisite: OR&IE 670 or permission of instructor.
3 lecs.
Estimation of quantiles, cdf's and pdf's. Properties of order statistics and rank-order statistics. Hypothesis testing in one- and several-sample situations; sign tests; use of ranks for tests and estimation. Small and large sample properties of tests; applications.

674 Design of Experiments
Spring. 3 credits.
Prerequisite: OR&IE 671 or permission of instructor.
Fall, offered 1983-84.
3 lecs.
Use and analysis of experimental designs such as randomized blocks and Latin squares; analysis of variance and covariance, factorial experiments, completely randomized designs, randomization tests. Goodness of fit, analysis of omnimplete tables; life tables; paired comparison experiments.

675 Qualitative Data Analysis
Spring. 3 credits.
Prerequisite: OR&IE 671.
Fall, offered 1983-84.
3 lecs.
Varieties of categorical data; cross classifications and contingency tables; 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; distribution of test statistics. Testing goodness of fit.

676 Statistical Analysis of Life Data
Fall. 3 credits.
Prerequisite: OR&IE 671 or equivalent.

677 Statistical Inference
Spring. 3 credits.
Prerequisite: OR&IE 671 or equivalent.
A study of multiple-decision problems in which a choice must be made among two or more courses of action. Major emphasis is on selection and ranking problems involving choosing the "best" category where goodness is measured in terms of a particular parameter of interest. Statistical formulations of such problems; indifference-zone, subset, and other approaches. Single-stage, two-stage, and sequential procedures. Applications. Recent developments.

680 Simulation
Spring. 3 credits.
Prerequisite: permission of instructor.
3 lecs.
An advanced version of OR&IE 580 intended for Ph.D.-level students.
728-729 Selected Topics in Applied Operations Research 728, Fall, 729, Spring. Credit to be arranged. Current research topics dealing with applications of operations research.

738-739 Selected Topics in Mathematical Programming 738, Fall, 739, Spring. Credit to be arranged. Current research topics in mathematical programming.

748-749 Selected Topics in Game Theory Fall, Spring. Credit to be arranged. Current research topics in game theory.

788-789 Selected Topics in Applied Probability Fall, Spring. Credit to be arranged. Current research topics in probability.

790 Special Investigations Fall, Spring. Credit to be arranged. Special investigations in courses not included in the regular catalog.

799 Thesis Research Fall, Spring. Credit to be arranged. For individuals doing thesis research for master’s or doctoral degrees.

891 Operations Research Graduate Colloquium Fall, Spring. 1 credit. A weekly 1 1/2-hour meeting devoted to presentations by distinguished visitors, by faculty members, and by advanced graduate students, on topics of current research in the field of operations research.

893-894 Applied ORIE Colloquium 893, Fall; 894, Spring. 1 credit each term. A weekly meeting of M.Eng. students. Discussion of assigned topics; presentations by practitioners in the field.

Theoretical and Applied Mechanics

Basics in Engineering Mathematics and Mechanics

202 Mechanics of Solids (also Engr 202) Fall, Spring. 3 credits. Prerequisite: coregistration in Mathematics 293. 2 lecs, 1 rec, 4 labs each semester. Evening exams. For description see Engineering Common Courses.

203 Dynamics (also Engr 203) Fall, Spring. 3 credits. Prerequisites: coregistration in Mathematics 294. 2 lecs, 1 rec, 4 labs each semester. Evening exams. For description see Engineering Common Courses.

293 Engineering Mathematics (also Mathematics 293) Fall, Spring. 3 credits. Prerequisite: Mathematics 192 or 194. Evening exams (see Mathematics 293.) Partial derivatives and multiple integrals; first- and second-order ordinary differential equations with applications in the physical and engineering sciences.

294 Engineering Mathematics (also Mathematics 294) Fall, Spring. 4 credits. Prerequisite: Mathematics 293.

Engineering Mathematics

310 Advanced Engineering Analysis I Fall, Spring. 3 credits. Prerequisite: Mathematics 294 or equivalent. Vector spaces and linear algebra, matrices, eigenvalue problems, and applications to systems of linear differential equations. Vector calculus. Boundary-value problems and introduction to Fourier series.

311 Advanced Engineering Analysis II Spring 3 credits. Prerequisite: T&M 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&M 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&M 610 or equivalent. 3 lecs. Emphasis on applications. Partial differential equations, tensor analysis; calculus of variations.

613 Methods of Applied Mathematics III Fall, Spring. 2 credits. Prerequisite: T&M 611, or equivalent. Features an 8-credit sequence (T&M 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&M 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&M 611 or equivalent. In context of applications; regular and singular perturbation theory; method of matched asymptotic expansions, two timing (method of multiple scales), WKBJ approximation.

616 Methods of Applied Mathematics IVb Spring. 2 credits. Prerequisite: concurrent registration in T&M 614 or equivalent. In context of applications; Hilbert-Schmidt and Fredholm theories of integral equations, Wiener-Hopf equations with application to finite integral, Carleman equation and its generalization, effective approximations.

Experimental Mechanics

640 Experimental Mechanics Fall. 3 credits 1 lec. 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

550 Introduction to Solid Mechanics Fall 3 credits. Prerequisite: T&M 610 or equivalent. Basic concepts in solid mechanics, stress, strain, momentum balance, energy principles, material properties. An introduction to elasticity, plasticity, viscoelasticity, fracture. A foundation for advanced courses in structures and solids.

651 Continuum Mechanics and Thermodynamics Fall. 3 credits. Offered alternate years. Kinematics, conservation laws, the entropy inequality, constitutive equations, frame indifference, material symmetry. Simple materials and the position of classical theories in the framework of modern continuum mechanics.

752 Topics in Continuum Mechanics Spring. 3 credits. Prerequisite: T&M 651. Offered alternate years. Not offered 1983-84. Polymer rheology using functional or state variables. Continuum theory for rapid shear flows of granular materials. Chemically driven flows, percolation, and finite deformation in biological porous-elastic solids.


Elasticity and Waves

574 Mechanical Vibrations and Waves Spring. 3 credits. Two 1 1/2-hour lecs; 4 labs each semester. Review of vibrations of discrete systems, including multi-degree-of-freedom vibrations. Unified treatment of vibrations and wave phenomena in continuous elastic systems, including strings, rods, beams, membranes, and plates. Approximate methods for finding natural modes and frequencies. Dispersion and group velocity. Temporal response of discrete and continuous systems.

663 Applied Elasticity Fall. 3 credits. Two 1 1/2-hour lecs. Thin curved bars. Plane stress and strain in cylinders; effects of pressure, rotation and thermal stress. Small (and large) deflection theory of plates; classical, approximate, and strain-energy methods. Thin cylindrical shells. A first course in elastic deformable bodies with numerous engineering applications.

664 Theory of Elasticity Spring. 3 credits Two 1 1/2-hour lecs.
Analysis of stress and strain. Airy's stress function solutions using Fourier series and integrals. Torsion theory. Three-dimensional solutions. Bending of prismatical bars. Axially loaded circular cylinder and half space. All topics are illustrated by engineering applications.

668 Fundamentals of Acoustics (also EE 442) Spring. 3 credits.
3 lect., 2 lab.
Introduction to the principles and theories of acoustics. The 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. At the discretion of faculty members, Ayres, Kinsler, Frey, Coppen, and Sanders.

The basic equations of large-deformation elasticity, solution of certain large-deformation problems. Linearization. Boussinesq-Papkovich potentials and three-dimensional problems, plane stress by method of Muskhelishvili; conformal mapping; torsion problems.

Two 1 1/2-hour lects.

[671 Advanced Dynamics] Spring 3 credits. Prerequisite: T&AM 570 or equivalent. Offered alternate years. Not offered 1983-94. 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 (Birkhoff's transformation); canonical transformations and Hamilton-Jacobi theory; Poisson stability and related topics from topological dynamics; Hamilton's principle for continuous systems, applications to shell dynamics.

[672 Celestial Mechanics (also Astronomy 579)] Spring. 3 credits. Offered alternate years. Not offered 1983-84.
Two 1 1/4-hour lects.
Description of orbits; 2-body, 3-body and n-body problems; Hill curvatures, libration points and their stability; capture problems; viral theorem. Oscillating elements, perturbations; effects of gravitational potentials, atmospheric drag, and solar radiation forces on satellite orbits; secular perturbations, resonances.

[673 Mechanics of the Solar System (also Astronomy 571)] Fall. 3 credits. Prerequisite: an undergraduate course in dynamics. Offered alternate years. Two 1 1/4-hour lects.

675 Nonlinear Vibrations Fall. 3 credits. Prerequisite: T&AM 574 or equivalent. Offered alternate years.

778 Qualitative Theory of Dynamical Systems Spring 3 credits. Prerequisite: T&AM 675 or equivalent. Offered alternate years.
Review of planar (single-degree-of-freedom) systems. The concept of dynamical systems, local and global analysis. Structural stability and bifurcations in planar systems. Center manifolds and normal forms. Discrete dynamical systems, maps and difference equations, homoclinic and heteroclinic motions, the Smale horseshoe and other complex invariant sets. Implications for systems of dimension greater than two, 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 Fall, 491; fall, 492; spring, 492. As arranged. Projects for undergraduates under the guidance of a faculty member.

796 Topics in Theoretical and Applied Mechanics—Fracture Mechanics Fall. 3 credits. Introduction to linear elastic fracture mechanics. Topics covered are linear elastic crack problems, crack-tip fields, stress-intensity factor, and energy-release rate. The second part of the course covers nonlinear fracture mechanics. Topics covered are small-scale yielding, J integral, crack-tip fields, elastic plastic crack solutions, analysis of crack growth, and time-dependent fracture mechanics.

797 Topics in Theoretical and Applied Mechanics—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.

798-799 Topics in Theoretical and Applied Mechanics Spring 3 credits. Special topics courses on subjects of current interest. Topics are announced when the course is offered.

890-990 Research in Theoretical and Applied Mechanics Fall, spring. Credit as arranged: 1-6 credits, 890; 1-9 credits, 990. S-U grades optional. Thesis or independent research at the M.S. (890) or Ph.D. (990) 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
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
Avedisian, G. Thomas, Ph.D., Princeton U. Asst. Prof., Mechanical and Aerospace Engineering
Babary, O. A., Ph.D., U. of California at Berkeley Asst. Prof., Computer Science
Bachman, Steven B., Ph.D., U. of California at Davis. Asst. Prof., Geological Sciences
Ballantine, Joseph M., Ph.D., Massachusetts Inst. of Technology. Prof., Electrical Engineering
Bartel, Donald L., Ph.D., U. of Iowa. Assoc. Prof., Mechanical and Aerospace Engineering
Bartsch, James A., Ph.D., Purdue U. Asst. Prof., Agricultural Engineering
Bassett, William A., Ph.D., Columbia U. Prof., Geological Sciences
Batterman, Boris W., Ph.D., Massachusetts Inst. of Technology. Prof., Applied and Engineering Physics
Beechofer, Robert E., Ph.D., Columbia U. Prof., Operations Research and Industrial Engineering
Berger, Toby, Ph.D., Harvard U. Prof., Electrical Engineering
Billera, Louis J., Ph.D., City U. of New York. Prof., Operations Research and Industrial Engineering
Bird, John M., Ph.D., Rensselaer Polytechnic Inst. Prof., Geological Sciences
Birman, Kenneth P., Ph.D., U. of California at Berkeley. Asst. Prof., Computer Science
Bisogni, James J., Ph.D., Cornell U. Assoc. Prof., Civil and Environmental Engineering
Bilton, Dina, Ph.D., Harvard U. Asst. Prof., Wisconsin Madison. Asst. Prof., Computer Science
Blakey, John M., Ph.D., Glasgow U. (Scotland). Prof., Materials Science and Engineering
Bland, Robert G., Ph.D., Cornell U. Prof., Operations Research and Industrial Engineering
Bloom, Arthur L., Ph.D., Yale U. Prof., Geological Sciences
Bolgiano, Ralph, Jr., Ph.D., Cornell U. Prof., Electrical Engineering
Booher, John F., Ph.D., Cornell U. Prof., Mechanical and Aerospace Engineering
Brown, Larry D., Ph.D., Cornell U. Assoc. Prof., Geotechnical Engineering
Brutsaert, Wilfried H., Ph.D., U. of California at Davis. Prof., Civil and Environmental Engineering
Bryant, Nelson M. E. E., Cornell U. Prof., Electrical Engineering
Buhrman, Robert A., Ph.D., Johns Hopkins U. Prof., Applied and Engineering Physics
Burns, Joseph A., Ph.D., Cornell U. Prof., Theoretical and Applied Mechanics
Cady, K. Bingham, Ph.D., Massachusetts Inst. of Technology. Assoc. Prof., Nuclear Science and Engineering
Caporano, Robert R., Sc.D., Massachusetts Inst. of Technology. Prof., Biophysics/Electrical Engineering
Carlin, Herbert J., D.E.E., Polytechnic Inst. of Brooklyn. J. Preston's Professor of Engineering, Electrical Engineering
Caughey, David T., Ph.D., U. of Pennsylvania. Assoc. Prof., Mechanical and Aerospace Engineering
Cline, John L., Ph.D., U. of Chicago. Assoc. Prof., Geological Sciences
Clark, David O., Ph.D., U. of California at Berkeley. Prof., Nuclear Science and Engineering
Clark, Douglas S., Ph.D., California Inst. of Technology. Asst. Prof., Chemical Engineering
Clayton, Rodney K., Ph.D., U. of California at Berkeley Inst. of Technology. Prof., Biological Sciences/Biophysics
Cocchetta, Joseph F., Ph.D., Massachusetts Inst. of Technology. Asst. Prof., Chemical Engineering
Cohen, Claude, Ph.D., Princeton U. Assoc. Prof., Chemical Engineering
Graduate School

Administration

Alison P. Casarett, dean
John F. Wootten, associate dean
Joycelyn Hart, assistant dean
Richard Lance, secretary of the graduate faculty

Graduate study at Cornell is pursued through the Graduate School, which administers the many graduate fields of study, and 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.), Master of Business Administration (M.B.A.), Master of Public Administration (M.P.A.), and Master of Professional Studies (M.P.S.) 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 Graduate School of Business and Public Administration, 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; these are announced 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.

Students from United States colleges and universities should be in the top third of their graduating class.

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 an application form 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 applying simultaneously 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.

Information concerning admission requirements and courses of study for professional degrees may be obtained from the several schools and colleges that administer them.

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. Both publications are available from the Graduate School, Cornell University, Sage Graduate Center, Ithaca, New York 14853.
School of Hotel Administration

Administration

John J. Clark, Jr., dean
James J. Eyster, assistant dean for academic affairs
Norman L. Peckenhaupt, assistant dean for business and administration
Peter Rainford, assistant dean for external affairs
Michael H. Redlin, graduate field representative
Marriana Desser, director, M.P.S. program
Cheryl S. Farrell, director of admissions and financial aid
Harry R. Keller, director of alumni affairs
Joan S. Livingston, executive editor, The Cornell Hotel and Restaurant Administration Quarterly
Mary K. Mikes, registrar
Margaret J. Oakford, librarian

Degree Program

Hotel and Restaurant Administration

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 practice inn, and an auditorium with full stage facilities. The five-story classroom section is supplemented by office, classroom, and laboratory space in the Alice Statler Auditorium wing. These two sections comprise lecture rooms, auditoriums, laboratories, 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 laboratory, contains fifty-two guest rooms, including two suites, a fully equipped front office, and lounge areas. The Inn also has a variety of restaurants seating a total of 1,000 people: a formal dining room for 200, five private dining rooms for 8 to 100, two self-service restaurants for 150 and 200, a cocktail lounge, and a ballroom for 400.

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.

In 1980 the school acquired a former retirement home overlooking Cayuga Lake. This spacious facility will house some of the school's nonacademic functions and serve as a conference center and an international training center for the hospitality industry.

Curriculum

The School of Hotel Administration offers training in the numerous disciplines required for modern management, including accounting, finance, marketing, operations, and human-resources development. 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. 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 summer period of ten weeks each or their equivalent of full-time, supervised 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 Announcement of the School of Hotel Administration. For further information on graduate programs, the reader should consult the Announcement of the Graduate School or contact Professor Michael H. Redlin, the school's graduate field 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 table below.
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 84 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 24 credits may be earned in courses chosen from the offerings of any college of the University, provided that the customary requirements for admission to such courses are met.

Students in the School of Hotel Administration who plan to attend summer school at Cornell or elsewhere or who propose to attend any other university, with the expectation that the credit earned will be counted toward the Cornell degree in hotel administration, must obtain the approval of the school in advance. Without advance approval, such credit will not count toward the degree.

*Students transferring from other colleges and universities may be allowed appropriate credit against the residence requirement at the time of admission. Transfer students must complete a minimum of five semesters in the program.

Credit earned in military science, aerospace studies, or naval-science courses may be counted in the 24-credit group of free electives.

All students are required by the University to take two courses in physical education, but no credit toward the academic degree is allowed for these courses.

Grading System

Letter grades ranging from A+ to F are given to indicate academic performance in each course. These letter grades are assigned a numerical weight for each term average as follows: A equivalent to 4.0; B to 3.0; C to 2.0; D to 1.0; F to 0.0. For good standing, the student must maintain a minimum average of 2.0. In order to graduate, a cumulative average of 2.0 and a final-term average of 2.0 are required as minimums. Of the free elective courses, a maximum of four credits 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 unsatisfactory or incomplete grades are honored by being placed on the dean's list.

Practice Requirement

As part of degree requirements, each undergraduate enrolled in the School of Hotel Administration must complete a minimum of two summer periods of ten weeks each of full-time, supervised employment and file acceptable reports for each work period. ** This requirement may also be satisfied by completing one such summer work period and sufficient part-time work to equal ten full-time weeks. Again, acceptable reports must be filed. Students entering the school who have extensive work experience may satisfy one half of the work-experience requirement if they make application for approval to the Practice Credit Committee at the time of matriculation and submit an acceptable report by the stated deadline. Students are not permitted to register for the final term of residence until they have satisfied the practice requirement in full.

Since cadets in the Army and Air Force Reserve Officer Training Corps are expected to spend six weeks in camp during the summer before their senior year, it is especially desirable that hotel students who plan to join the corps complete the first semester of cadet costs during the summer before their junior year. Again, acceptable reports must be filed. Students entering the school who have extensive work experience may satisfy one half of the work-experience requirement if they make application for approval to the Practice Credit Committee at the time of matriculation and submit an acceptable report by the stated deadline. Students are not permitted to register for the final term of residence until they have satisfied the practice requirement in full.

Although the practice requirement is an essential part of the student's program, the school does not guarantee summer positions. Through the school's numerous contacts with the hotel and restaurant industry, a considerable number of openings are available for students. Because jobs suitable for foreign students are considerably less numerous than jobs for students who are American citizens, the foreign student should anticipate some difficulty in finding a position. The school gives what assistance it can to foreign students, but it cannot guarantee placement or assume responsibility for it.

Many of the major hotel and restaurant organizations provide special opportunities for Cornell students to gain wide-ranging experience through unique apprenticeship arrangements. 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 of these programs, see Directed Study, on the following pages.

**As set forth in the Practice Instruction Handbook, supplied on request from the School of Hotel Administration.
Course Requirements for Graduation

Specifically required courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative and general management:</td>
<td></td>
</tr>
<tr>
<td>Hotel Administration 101</td>
<td>0</td>
</tr>
<tr>
<td>Human-resources management: Hotel Administration 111</td>
<td>6</td>
</tr>
<tr>
<td>Accounting and financial management: Hotel Administration 121, 122, 125, 221, 222</td>
<td>15</td>
</tr>
<tr>
<td>Food and beverage management: Hotel Administration 131, 132, 231, 233, 331</td>
<td>12</td>
</tr>
<tr>
<td>Law: Hotel Administration 341, 344</td>
<td>6</td>
</tr>
<tr>
<td>Properties management: Hotel Administration 251, 252, 255, 256</td>
<td>12</td>
</tr>
<tr>
<td>Communication: Hotel Administration 165, 265</td>
<td>6</td>
</tr>
<tr>
<td>Science and technology: Hotel Administration 171, 172, 173, 174</td>
<td>12</td>
</tr>
<tr>
<td>Economics, marketing, and tourism: Hotel Administration 281, 282, 284</td>
<td>9</td>
</tr>
<tr>
<td>Humanities and social sciences electives</td>
<td>6</td>
</tr>
</tbody>
</table>

Specifically required credits | 84
Hotel electives | 14
Free electives | 24

Total credits required for graduation | 122

Undergraduate Program of Study

This typical arrangement of courses, year by year, is offered for illustration.

The curriculum of the School of Hotel Administration is continually 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.

Freshman Year

Typically, a freshman schedule will consist of 14 to 17 credits each semester, selected from the following courses.

Specifically required courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 165, Basic Business Writing</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 111, Introductory Psychology</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 101, Orientation</td>
<td>0</td>
</tr>
<tr>
<td>H Adm 174, Information Systems</td>
<td>0</td>
</tr>
<tr>
<td>H Adm 121, Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 122, Hospitality Accounting Systems</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 125, Finance</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 131, Introduction to Food and Beverage Operation</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 132, Techniques of Food Production</td>
<td>1</td>
</tr>
<tr>
<td>H Adm 171-172, Food Chemistry I and II</td>
<td>7</td>
</tr>
<tr>
<td>H Adm 173, Sanitation in the Food-Service Operation</td>
<td>2</td>
</tr>
</tbody>
</table>

Suggested electives* |

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 102, Lectures in Hotel Management</td>
<td>1</td>
</tr>
<tr>
<td>H Adm 161, Typewriting</td>
<td>2</td>
</tr>
</tbody>
</table>

Sophomore Year

Specifically required courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 211, Management of Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 221, Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 222, Managerial Accounting in the Hospitality Industry</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 231, Meat Science and Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 233, Food Production Systems: Cafeterias</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 281, Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 282, Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 281, Property-Management Graphics</td>
<td>3</td>
</tr>
</tbody>
</table>

H Adm 265, Effective Communication          | 3       |
H Adm 331, Food Production Systems: Restaurants | 3       |
H Adm 274, Hotel Computing Applications      | 3       |
H Adm 223, Front-Office Machine Accounting   | 1       |
H Adm 234, Food and Beverage Control        | 2       |
H Adm 261, Report Typing                    | 1       |

Suggested electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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 314, Psychology in Business and Industry</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 381, Advertising and Public Relations</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 483, Psychology of Advertising</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 322, Investment Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 323, Financial Analysis and Planning</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 325, Introduction to Statistical Analysis and Inference</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 204, Franchising in the Hospitality Industry</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 294, Tourism</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 342, Law of Business II</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 306, General Survey of 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</td>
<td>3</td>
</tr>
<tr>
<td>Business and Public Administration NBA 505, Auditing</td>
<td>3</td>
</tr>
</tbody>
</table>

Senior Year

Specifically required courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>H Adm 451, Physical-Plant Planning and Construction</td>
<td>3</td>
</tr>
</tbody>
</table>

Suggested electives

<table>
<thead>
<tr>
<th>Course</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 311, Union-Management Relations in Private Industry</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 401, Seminar in Management Principles</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 285, Hotel Sales</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 601—602, Management Intern Program</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 421, Internal Controls in Hotels</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 610, Undergraduate Independent Research in Human-Resources Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 620, Undergraduate Independent Research in Financial Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 333, Corporate Restaurant Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 338, Purchasing</td>
<td>2</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>1</td>
</tr>
</tbody>
</table>

With the exception of the Management Intern Program, only the first three credits of independent study in any area may be counted toward hotel electives. The rest will be credited against free electives.

H Adm 354, Food-Facilities Equipment Design and Layout | 3       |
H Adm 453, Seminar in Environmental Control | 3       |
H Adm 454, Seminar in Hotel Planning | 3       |
H Adm 455, Seminar in Restaurant Planning | 3       |
H Adm 650, Undergraduate Independent Research in Properties Management | 3       |
H Adm 364, Advanced Business Writing | 3       |
H Adm 660, Undergraduate Independent Research in Communication | 3       |
H Adm 670, Undergraduate Independent Research in Science and Technology | 3       |
H Adm 680, Undergraduate Independent Research in Economics, Marketing, and Tourism | 3       |

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</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative and General Management</td>
<td></td>
</tr>
<tr>
<td>H Adm 102, Lectures in Hotel Management</td>
<td>1</td>
</tr>
<tr>
<td>H Adm 200, Personal Real-Estate Investments</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 203, Club Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 204, Franchising in the Hospitality Industry</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 205, Resort and Condominium Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 206, General Insurance</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 301, Development of a Hospitality Property</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 302, Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 304, Rooms-Division Management—Front Office and Reservations</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 305, Rooms-Division Management—Housekeeping and Laundry Operations</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 306, General Survey of Real Estate</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 307, Hotel Security and Crime Prevention</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 309, Quality Assurance for the Hospitality Industry</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 401, Seminar in Management Principles</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 402, Hotel Management Seminar</td>
<td>1</td>
</tr>
<tr>
<td>H Adm 404, Management Organization of the Small Business</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 407, Seminar in Hotel Operations</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 408, Casino Management</td>
<td>2</td>
</tr>
<tr>
<td>H Adm 409, T.A. Training in Administrative and General Management</td>
<td>1—3</td>
</tr>
<tr>
<td>H Adm 600, Undergraduate Independent Research in Administrative and General Management</td>
<td>1—3</td>
</tr>
<tr>
<td>H Adm 601, Management Intern Program I</td>
<td>6</td>
</tr>
<tr>
<td>H Adm 602, Management Intern Program II</td>
<td>6</td>
</tr>
<tr>
<td>Human-Resources Management</td>
<td></td>
</tr>
<tr>
<td>H Adm 311, Union-Management Relations in Private Industry: A Survey</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 313, Training Human Resources in the Hospitality Industry</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 314, Psychology in Business and Industry</td>
<td>3</td>
</tr>
<tr>
<td>H Adm 411, Hotel Manpower Management Simulation</td>
<td>3</td>
</tr>
</tbody>
</table>

Undergraduate Program of Study 283
Graduate Curriculum

Candiates 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 program, specifically designed for each student, based on previous experience and career goals. Students who hold Bachelor of Science degrees in hotel administration from an institution other than Cornell qualify for the track I curriculum. A minimum of three residence units and 48 credits is required to complete track I. Students must take 15 credits in a major, 5 credits of monograph (related to their major), 15 elective credits, and any required courses not yet completed prior to their arrival.

The curriculum for M.P.S. track II and III are specifically designed for each student, based on previous experience and career goals. Students who hold Bachelor of Science degrees in hotel administration from an institution other than Cornell qualify for the track II curriculum. A minimum of three residence units and 48 credits is required to complete track II. Students must take 15 credits in a major, 5 credits of monograph (related to their major), and 15 elective credits.

Track IV is for students who hold a master's degree and have no prior degrees in Hotel Administration. Students must take 15 credits in a major, 5 credits of monograph (related to their major), and 15 elective credits.

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. Open to new hotel students and students sponsored by the Hotel School to the Division of Unclassified students only. S-U grades only. Required. M 12:20-2:15, D. E. Whitehead. Seminar designed to introduce freshmen to the significant disciplines and major areas of hospitality. An introduction to the school, Stater Inn, and the various facets of the hospitality industry.

102 Lectures In Hotel Management Fall. 1 credit Limited to 90 students. B. J. Clark. A series of lectures given by individuals 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 and visiting lecturers. The private-membership club and how it differs from other business forms in the hospitality industry. Emphasis is on legal and operational aspects of ownership and governance. All types are discussed, from the small, in-town luncheon club to the large, complex suburban operation. New developments in the field are surveyed. Club managers serve as visiting lecturers.

204 Franchising in the Hospitality Industry Spring, weeks 1-7. 2 credits. Hotel elective. M 12:25-4:45, D. E. Whitehead. Relationships between franchisor and franchisee; advantages and disadvantages of franchising, structure and services offered by franchisors. Case studies of leading motel and restaurant companies currently offering franchises. Guest speakers from the franchising industry.

205 Resort and Condominium Management Spring. 3 credits. Hotel elective. T 1:25, R 2:30-4:25. M. A. Noden. The operation of resort hotels and condominiums. Resort in various types, seasons, and economic levels are considered. Emphasis is on the promotion of business, the provision of facilities, services, and guest entertainment; and the selection, training, and direction of employees. Terminology, rental-pool relations, and operational losses related to personal and property concerns are also discussed.

206 General Insurance Fall. 3 credits. Hotel elective. M W F 12:20. K. McNeil. A comprehensive introduction to the insurance industry. The emphasis is on fire insurance, casualty insurance, and multiple peril policies. Topics covered may include the law of contracts as it relates to insurance: 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 305 may take H Adm 300 as a free elective. T 10:10-12:05. 1 hour TA rec as scheduled. D. Sher. Lecture 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, ownership, and the structure of the market; (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.

301 Development of a Hospitality Property Spring. 3 credits. Hotel elective. M 12:20-2:15, D. E. Whitehead. Seminar groups of two to four students develop a hospitality project. All aspects of development are covered, from the feasibility study, site acquisition, franchising, construction management, operational preopening, marketing, furniture and fixture installation, through the opening of the hotel, motor inn, or restaurant.

302 Principles of Management Fall or spring 3 credits. Prerequisite: H Adm 211 or equivalent. Hotel elective. Prerequisite for H Adm 401. W 11:15-1:10 and F 9:05. P. L. Gaurnier. 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. F 1-4:30. S. Weisz and visiting lecturers. An operational view of the front-office and reservation functions. A trip to Washington, D.C., is scheduled for late in the term.

305 Rooms-Division Management—Housekeeping and Laundry Operations Fall. 2 credits. Hotel elective. Estimated cost of field trip to Washington, D.C., $50. F 10:15-12:05. S. Weisz 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. Pr. Adm 121, 122, 281, and 282 or equivalent, or written permission of instructor. Hotel elective. M 3:30-4:45. rec, T 1:25. D. Sher. A practical survey of real estate as capital-investment in the hospitality industry and related-industries. 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 decisions; the marketing and merchandising of real estate; the financing of real estate; and the effects of real-estate financing on a company's overall financial structure and on its future bond rating. Tuesday field trips will deal with application of these subject matters through case studies, financial analyses, role playing sessions, and the like.

307 Hotel Security and Crime Prevention Summer. 2 credits. Hotel elective. M 9-9. J. E. H. Sherry and school faculty. Designed to provide corporate hotel management with a practical orientation for resolving the operational losses related to personal and physical-premises security. Faculty members discuss aspects of liability, insurance protection, architectural and interior design, security design controls, financial controls, and personnel administration.

309 Quality Assurance for the Hospitality Industry Fall or spring. 2 credits. Limited to 30 students. Prerequisite: H Adm 211 and 302 or permission of Prof. Gaurnier. Hotel elective. F 10:10-12:20. Visiting lecturer. The course, developed for Cornell by the American Hotel and Motel Association and Collins Hall Associates, centers on the skills required for the assessment of need, development, budgeting, and implementation of a quality assurance program. Topics will include definitions of quality, diffusion of ideas and innovation, the "cost" of quality, quality standards, measurement and reporting, reward and recognition, developing the plan and budget, and implementing the quality assurance plan. Students will need to use their full range of knowledge in all areas of hospitality, plus skills in interpersonal and group dynamics.

401 Seminar in Management Principles Fall or spring. 2 credits. Limited to 20 seniors and graduate students. Prerequisite: H Adm 302. Hotel elective. T 11:15-1:10. P. L. Gaurnier. This course uses the case-study approach to management principles and concepts. Each student prepares a comprehensive analytical report, based on previous work, for class discussion and analysis.

402 Hotel-Management Seminar Fall. 1 credit Limited to 20 seniors and graduate students. Hotel elective. F 2:30. Dean J. J. Clark. Meeting with Hotel Administration 102 speakers. The subject matter varies, depending on the visitor and his or her area of expertise. Students are expected to ask questions and participate in discussions.

404 Management Organization of the Small Business Fall. 3 credits. Limited to 30 students. Prerequisite: H Adm 221 or Agricultural Economics 323 or equivalent. Hotel elective. Approximate cost of field trips, $25. T 1-4:25. F. M. Waters. A comprehensive survey of management fundamentals basic to planning, organizing, directing, and controlling the small enterprise. Course work includes a team term project, selected readings, case studies, and field exercises.


407 Seminar in Hotel Operations Spring 2 credits. Limited to 30 seniors and graduate students. Hotel elective. Estimated cost of field trip, $30. F 10:10-12:20. P. Kreuziger. 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. Major topics include staffing, budgeting, and payroll control, forecasting techniques and practice, considerations for operating within the guidelines of collective bargaining, financial-statement analysis, and hotel case studies oriented toward productivity analysis. A field trip, usually in the third week, is required.

408 Casino Management Fall or spring. 2 credits. Limited to 50 School of Hotel Administration seniors and graduate students. Hotel elective. Estimated cost of field trip, $100. M 3:30-4:45. D. Macomber. This management responsibility of casino operations. Overview and analysis of casino administration, with emphasis on the relationship between the hotel general manager and the casino manager; their various responsibilities, marketing and junkets, physical layouts, licenses, government regulation, personnel and training, internal controls, and security systems. General instruction in basic casino games, including odds, percentages, and strategy. Includes a weekend field trip to Atlantic City.

409 T.A. Training In Administrative and General Management Fall or spring. 1-3 credits. Prerequisite: written permission of instructor. Hotel elective. Hours to be arranged. Faculty. The management responsibility of the teaching assistant in administrative and general management is exposed to recommended techniques of instruction and such other methodology, readings, et cetera, as the professor in charge of the course may require.
286 Hotel Administration


Intended to provide a working knowledge of the terminology, concepts, and procedures utilized by hotel management in developing interest and making decisions relevant to forecasting and controlling manpower requirements consistent with fluctuating business conditions. Major topics include staff planning, budgeting, scheduling and payroll control, forecasting technique and practice, considerations for operating within the guidelines of collective bargaining, financial-statement analysis, and hotel case studies oriented toward financial-statement analysis and new to 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, to prepare adequately for this trip, all students are required to attend the first week of classes. Students who intend to return to school one week late should not preregister for this course.

Human-Resources Management Courses

111 Introductory Psychology Fall or spring. 3 credits. Required. Lecs, M W F 9:05, 2-hour lab to be arranged. F. Berger.

An introductory study of psychological principles essential for understanding human behavior. Basic concepts integral to effective hotel management are treated, including perception, motivation, learning, and personality.

211 Management of Human Resources Fall or spring. 3 credits. Prerequisite for hotel students: H Adm 111. Lecs, M W F 12:20, 1-hour lab to be arranged. D. A. Dermody.

Problems of personnel management, including an introduction to the personnel function, recruitment, selection, and placement of personnel; the role of supervision with emphasis on induction, training, communications, performance appraisal, and leadership style; wage and salary administration; motivation; and union-management relations. Emphasis is on class discussion and analysis of case problems from business and industry.

311 Union-Management Relations in Private Industry: A Survey Fall. 3 credits. Limited to juniors, seniors, graduate students, and those who have received written permission of the instructor. Hotel elective. T 12:20–3:15, W 1:25; 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, including negotiation, mediation, arbitration, and the critical role of conciliation procedures (such as mediation and arbitration) in keeping industrial peace.

313 Training Human Resources in the Hospitality Industry Fall. 3 credits. Limited to 40 students. Prerequisites: H Adm 211 or 314, or equivalent. Hotel elective. T 12:20–2 and R 12:20. Faculty.

A basic course in the fundamentals of training manpower. Starting with the psychology of learning, the course will move quickly into the applications of training techniques in solving hotel and restaurant manpower- utilization problems. Each student will be required to develop a training program for a job or task. Emphasis will be on improving performance through the management of training.

314 Psychology in Business and Industry Fall or spring. 3 credits. Limited to 50 School of Hotel Administration students. Senior or graduate students. H Adm 111 and 211, or equivalent. Hotel elective. Students who plan to take H Adm 315 should plan to take 314 first. T 12:20–2:15, R 12:20. Faculty.

The principles of psychology applied to industrial and business systems; personnel selection; placement and training; problems at work, including evaluation, motivation, efficiency, and fatigue, and the social psychology of the work organization.

411 Hotel Manpower Management Simulation Spring. 3 credits. Limited to 20 Hotel Administration seniors and graduate students. Hotel elective. R 2–4:25. Faculty.

The course, based on the simulation of a profit-making facility and of a nonprofit facility, provides advanced training in the use of simulation as a training device. Groups of four or five students develop a simulation exercise.

414 Organizational Behavior and Small-Group Processes Fall. 3 credits. Open to a limited number of hotel seniors and graduate students by written permission of the instructor. Hotel elective. M 2–4:25. F. Berger.

Current research will be examined to provide a conceptual framework for understanding group processes within organizations. In addition, students will participate in experiential laboratories aimed at enhancing their effectiveness as members or leaders of groups. Topics that will be studied include stages of group development, leadership, decision making, motivation, power, and organizational change.

416 Special Studies in the Management of Human Resources Fall. 3 credits. Limited to seniors and graduate students, except for those who have received written permission of the instructor. Prerequisite: H Adm 211. Hotel elective. M 7:30–9:30 p.m., T 1:25–2:15; F. Berger.

A case-study approach to the problems and challenges of managing people in business organizations. Actual cases are presented for discussion by individuals who were involved in the cases.

419 T.A. Training in Human-Resources Management Fall or spring. 1–3 credits. Prerequisite: written permission of instructor. Hotel elective.

Hours to be arranged. D. A. Dermody. The student planning to be a teaching assistant in human-resources administration is exposed to recommended techniques of instruction and such other methodologies, resistance, and ethics, as the professor in charge of the course may require.

711 Dispute Resolution in Service Industries Spring. 3 credits. Limited to graduate students and seniors who have received written permission of instructor. Hotel elective. W 2:30–5:30. F. A. Herman.

The nature of conflicts that arise during negotiation of new labor contracts (interest disputes), and those that arise over the meaning and interpretation of labor contracts already in force (grievance disputes). Methods for resolving conflicts in nonunionized property and the development of procedures (such as mediation and arbitration) in keeping industrial peace. Themes that will be treated, including perception, motivation, learning, and personality.

718 Advanced Human-Resource Management Spring. 3 credits. Limited to 18 graduate students. Prerequisites: H Adm 111 and 211 or equivalent. Hotel elective. M 10:10–12:50. Two weekend sessions: week 6 and week 12. (The number of M sessions will be adjusted accordingly.) F. Berger.

The focus will be on development of human-resource management skills and exploration of the dilemmas and challenges of leadership. The students will gain insight into their patterns of management behavior by integrating conceptual material with management games and simulations, interaction analysis, and constructive feedback.

Accounting and Financial Management Courses

120 Basic Principles of Accounting and Financial Management Fall or spring. 2 credits. Limited to students outside the School of Hotel Administration. May be taken with H Adm 322 to include the investment aspects of hotel management. W 2:30–4:25. F. M. Waters.

A survey of accounting principles, financial statements, cash forecasting, and cash budgeting, and an introduction to financial analysis. Intended for students who desire a general knowledge of the language of business and finance.

121 Financial Accounting Fall or spring. 3 credits. Required. Limited to School of Hotel Administration students. Lecs, M W 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.

122 Hospitality Accounting Systems Fall or spring. 3 credits. Required. Hotel Administration students. Lecs, M W 10:10; lab, T or R 2:30–4:25. D. C. Dunn.

The accounting systems recommended by the American Hotel and Motel Association, the National Restaurant Association, and the American School of Hotel Association of America for hotels, motels, restaurants, and clubs. Topics include hotel and motel front office accounting, accounting for the restaurant and other sales areas, special journals and ledger accounts, and the practical applications of accounting, particularly to hospitality-accounting systems: the flow of accounting transactions through the accounting system; and the preparation and interpretation of financial statements.

125 Finance Fall or spring. 3 credits. Prerequisite: H Adm 121 or equivalent. Required. T R 9:05, lab, T or R 2:30–4:25. D. C. Dunn.

T R 11:15, 1-hour lab to be arranged. R. M. Chase.

An objective study of financial management 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. D. C. Dunn.

The basic principles of accounting, including transactions analysis and flow of accounting data to the financial statements. Emphasis is on 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. Required. Lecs, M W 10:10; 2-hour lab to be arranged. Two evening exams to be arranged. Faculty.

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 Managerial Accounting in the Hospitality Industry  
Fall or spring. 3 credits. Limited to 160 students. Prerequisite: H Adm 122 or 221 or equivalent. Required.  
Lecs: T R 10:10; 1-hour lab to be arranged. C. Henny  
Methods of operational analysis for hospitality properties are evaluated and used 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 on presenting analysis results in management letters.

223 Front-Office Machine Accounting  
Fall or spring. 1 credit. Prerequisite: H Adm 121 or equivalent. Hotel elective.  
Two-hour practice lab to be arranged. D. C. Dunn  
Students learn the operation of the NCR front-office posting machine by completing a series of practical exercises ranging from simple posting of charges and credits to error correction and the night audit.

321 Hotel Management Contracts  
Fall, 7 weeks only. 1 credit. Limited to 60 juniors, seniors, and second-year graduate students. Hotel elective.  
A critical analysis of the negotiation and administration of hotel management contracts. Topics include advantages, disadvantages, and risks of contracts to both owners and operators; owner and operator concerns during negotiations and their resolution; owner-operator concurrency during administration of the contract, and the future role of contract use. Guest lecturers include owners and operators.

322 Investment Management  
Fall or spring. 2 credits. Limited to juniors, seniors, and graduate students. Hotel elective.  
R 10:10–12:05. Faculty.  
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.  
M W 9:05–11: F. M. Henry  
After defining and describing the environment in which a business organization must design its strategy, an examination will be made of financial analysis and planning techniques necessary to operate in that environment. Focus 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 20 students. Prerequisite: H Adm 251 and 221. Hotel elective.  
W 2:30–4:25. R. H. Penner  
An introduction to and concentrated study of financial charts and 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, etcetera. Students analyze and evaluate charts from annual reports and the media, and design charts to communicate data effectively.

328 Cost Accounting  
Spring. 3 credits. Prerequisite: H Mkt 311 or equivalent. Hotel elective.  
T R 10:10–12:05. D. H. Ferguson  
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, internal 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  
Spring. 2 credits. Limited to seniors and other students who have received permission of instructor. Prerequisite: H Adm 122, 722, or equivalent. Hotel elective.  
T R 9:05 or T R 10:10. A. N. Geller  
Discussion of problems recently faced in distributing the accounting and clerical work in hotels to ensure a good system of internal control. Study of many actual cases of the failure of internal control and the analysis of the causes of the failure. Practical problems and actual techniques of functioning systems of internal control are examined.

422 Taxation and Management Decisions  
Fall. 2 credits. Limited to 50 juniors, seniors, and graduate students. Hotel elective.  
W 2:30–4:25. 1-hour rec to be arranged.  
S. J. Sekhar  
An introduction to tax advantages and disadvantages of various organizational structures, including corporations, partnerships, and Subchapter S corporations; financial-information reporting to tax authorities; and the use of depreciation methods to achieve tax reductions; syndication techniques; and the role tax laws play in promoting private investment and development.

429 T.A. Training in Accounting and Financial Management  
Fall or spring. 1–3 credits. Prerequisite: written permission of instructor. Hotel elective.  
Hours to be arranged. Faculty.  
The student who plans to be a teaching assistant in accounting and financial management is exposed to recommended techniques of instruction and such other methodology, readings, etcetera, as the professor in charge of the course may require.

722 Graduate Managerial Accounting in the Hospitality Industry  
Spring. 3 credits Required. M.P.S. course.  
T R 2:30–4:25. D. H. Ferguson  
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 analyses. Other topics include internal control, operational budgeting, and the use of feasibility studies in long-term capital-budgeting decisions. Stress is on communicating analysis results using management letters.

723 Graduate Corporate Finance  
Fall. 4 credits. Prerequisite: H Adm 722. Recommended: knowledge of algebraic techniques and elementary statistics (students who had not recently had a statistics course are urged to purchase and study programmed review books in mathematics and elementary statistics). Other topics include internal control, capital budgeting, cost of capital, capital structure, dividend policy, long-term financing and bank relations, short- and intermediate-term financial management, mergers and consolidations, and the legal aspects of financial management.

724 Interpretation and Analysis of Financial Statements  
Spring. 3 credits. Limited to 20 second-year graduate students. Prerequisite: all required hotel accounting courses. Hotel elective.  
T R 2:30–4:25. A. N. Geller  
The various financial accounting issues encountered in reporting the results of operations of corporate enterprises are discussed. A macro view of the firm will be taken, with emphasis on both outsiders' views of the operation and decision making through interpretation of the published statements. Current, generally accepted accounting principles and future extensions are explored and discussed. Emphasis is on the components of financial statements, how and why they are reported, and their impact on the overall financial position of the firm.

Food and Beverage Management Courses

131 Introduction to Food and Beverage Operation and Management  
Fall or spring. 2 credits. Required.  
W 11:15–1:10. J. B. Knight  
An introductory course designed to familiarize students with the language and systems of commercial food and beverage operations. The language of food production, equipment, utilities, preparation, cooking, baking, and service will compose the major portion of the course.

132 Food-Production Techniques  
Fall or spring. 1 credit. Prerequisite: H Adm 131. Hotel elective.  
3-hour sec to be arranged. T. A. O'Connor  
A laboratory-based course designed to familiarize students with techniques of food preparation. Practical application of information gained in hotel Administration 131. Each student must supply a cook's knife and paring knife.

231 Meat Science and Management  
Fall or spring. 3 credits. Required.  
Lec. M 2:30–4:25; 2-hour lab to be arranged. G. X. Norkus, B. A. Schmidt  
Deals with the major phases of meat, poultry, and fish service from the hotel, restaurant, club, and institutional standpoints; nutritive value, structure, and composition; sanitation, selection and purchasing, cutting, freezing, portion control, and specifications; cooking, canning, and miscellaneous topics. A three-day field trip to visit purveyors in New York is required.

233 Food-Production Systems: Cafeterias  
Fall or spring. 3 credits. Prerequisites: H Adm 131, 132, 171, 172, 173, 231 (possible corequisite). Required.  
Lec. M 1:25; 6-hour afternoon lab. A. L. Colucci  
A cafeteria food-production course in which the student participates as a team member in hot-food, cold-food, dessert, and bakery production. Lectures cover principles of cafeteria menu planning, truth-in-menu, recipe standardization, support areas, sanitation, calculating raw food costs, menu-pricing systems, convenience foods, and types of production systems. Students are required to purchase their own French, boning, and paring knives; measuring spoons, and food thermometer. Students work six to seven weeks in each of two different cafeterias.

234 Food and Beverage Control  
Fall or spring. 2 credits. Prerequisite: H Adm 122 or written permission of instructor. Hotel elective.  
T R 9:05–11. D. W. D'Aprix  
Food and beverage operation from the position of the food and beverage manager and analyst are studied. Control systems and analytical techniques are discussed and applied to operational situations.

331 Food-Production Systems: Restaurants  
Fall or spring. 3 credits. Prerequisites: H Adm 231 and 233. Required. Estimated expense of clothing and utensils, $95.
288 Hotel Administration

Lec, M 1:25; 8-hour lab M, T, W, or R. T. J. Kelly, R. White.
This course is designed to provide the student with the skills necessary to perform the management functions of a restaurant.

337 Survey of Beverages Spring. 2 credits.
An introduction to wines, beers, spirits, and other beverages as they relate to the hospitality industry. Samples from a variety of countries, regions, and vineyards are evaluated.

338 Purchasing Spring. 2 credits.
An in-depth look into the functions of a purchasing department within a hotel or restaurant facility. The managerial aspects of purchasing, such as setting up a purchasing department, the function of the purchasing agent, purchasing specifications, purchasing forms, and controls are considered. Included is the analysis of the products purchased by a food facility, such as china, flatware, glasses, fabric, meat, frozen foods, canned goods, produce, dairy products. The products are displayed by leading purveyors and discussed in detail.

430 Introduction to Wine and Spirits Fall or spring. 2 credits.
Limited to seniors and graduate students outside the School of Hotel Administration. S-L grades only. W 2:30–4:25. M. Nowlis.
The course begins with the history of wine and spirits. The main focus is on flavor characteristics, fermentation processes, and brand specifications. Lectures are also given on purchasing, storage, wine-tasting techniques, and drink formulas. Samples from a variety of countries, regions, and vineyards are evaluated. Preregistered students who do not attend the first class and fail to notify the secretary in 212 Statler Hall of their absence are automatically dropped from the course.

433 Food-Service Management in Business, Industry-, and Health-related Facilities Fall or spring. 3 credits.
Prerequisites: (hotel students) H Adm 331; (out-of-school students) equivalent of H Adm 331. Required (all students): a nutrition course. Hotel elective. Estimated cost of required field trip. $150.
Designed to explore and analyze the internal workings of food-service management in business, industry-, and health-related facilities, the course builds on information gained from required courses. It presents characteristics, of, and analyzes, food-service organization structures, job descriptions, internal controls, internal-systems design, specialty food-service equipment considerations, and regulations. These factors are analyzed in the context of areas such as office and industrial complexes, airline catering, concession management, educational institutions, and contract and hospital food-service management. A field trip to a metropolitan area, where each type of food-service management in operation, is an integral part of the course. Conferences with appropriate directors and managers, as well as on-campus guest speakers, are included in the course.

434 Production and Merchandising of Desserts Fall or spring. 3 credits.
Prerequisites: H Adm 233, 331, or 732. Hotel elective.
How to make and profitably merchandise such desserts as pies, sweet-dough pastries, danish and puff pastries, pâté choux, cookies, cakes, ice desserts, and other specialty desserts.

437 Seminar in International Cuisines Spring. 3 credits.
Prerequisites: H Adm 331 or 732 and permission of instructor. Hotel elective.
A seminar in cuisines of the world. Through research and hands-on practice, students will explore various cuisines in depth. The goal of the course is to develop an awareness of the evolution of several international cuisines through cultural developments, enabling students to create diverse menus.

439 T.A. Training in Food and Beverage Management Fall or spring. 1–3 credits.
Prerequisite: written permission of the instructor. Hotel elective.
Hours to be arranged. Faculty.
The student who plans to be a teaching assistant in food and beverage management is exposed to recommended techniques of instruction and such other methodology, readings, et cetra, as the professor in charge of the course may require.

731 Graduate Food and Beverage Management Fall or spring. 3 credits. Required M.P.S. course. Estimated cost of field trip, $100.
Lecs, T 11:15–12:05; R 11:15–1:10; four 7:30–9:30 p.m. lab periods to be arranged. S. A. Mukkoski.
The managerial and operational principles and techniques of planning, operating, and evaluating a food and beverage operation. Special emphasis is placed on menu planning, wine-list design, professional standards, and the managerial approach to purchasing, receiving, storage,issuing, preparation, and service. A field trip is required.

732 Graduate Operational Food-Production Systems Fall or spring. 2 credits. Limited to 24 students. Prerequisite: H Adm 731 or equivalent. Required M.P.S. course. Estimated expense for clothing and utensils, $95.
Lec, T 5:30–8:30 p.m.; 8-hour F lab. J. B. Knight.
Students are responsible for production and service of dinner for the Statler Inn Main Dining Room and Cafe Rhea. The course is designed to teach and apply the fundamentals of food-production systems, from menu planning through service, and to give the student confidence in managing a commercial kitchen or dining room. The lecture-demonstration provides further exposure to managerial as well as technical skills.

735 Graduate Meat Science and Management Fall. 3 credits. Limited to graduate students. M.P.S. elective.
M 5:30–8:30 p.m. S. A. Mukkoski.
Purchasing, regulating, storage, utilization, and cost analysis of meat, fish, poultry, and meat extenders and analogs are discussed from the standpoint of commercial food service in a seminar-laboratory combination. Independent research on current problems in meat science and management is required.

Law Courses

247 Law and the Woman Employee Spring. 3 credits. Hotel elective.
Designed to enable management to deal with the legal problems of female employees as these problems affect the hospitality industry and to provide information regarding the emerging legal rights of women generally.

341 Law of Business I Fall. 3 credits. Limited to juniors and seniors. Required.
A basic introduction to law and legal relationships in business. A variety of subjects are covered, all intended to aid managers in decision making.

342 Law of Business II Spring. 3 credits.
Prerequisite: H Adm 341. Hotel elective.
A continuation of Hotel Administration 341 for those students who desire more extensive legal training to further their business careers. Emphasis is on the laws pertaining to the Uniform Commercial Code (sales and negotiable instruments); bailments; trusts and estates; transfers by will; unfair competition and trade regulation; bankruptcy; and insurance.

343 Law of Securities Regulation Fall. 7 weeks only 1 credit. Open to juniors, seniors, and graduate students. Best taken after an introductory course in business law. Hotel elective.
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.

414 Law of Inkeeping Fall or spring. 3 credits.
A basic grounding in the fundamentals of hotel and restaurant management as they affect legal rights and responsibilities. Emphasis is on resolution of issues and organization of solutions in a logical, well-conceived manner.

449 T.A. Training in Law Fall or spring. 1–3 credits. Prerequisite: written permission of instructor. Hotel elective.
Hours to be arranged. Faculty.
The student who plans to be a teaching assistant in law is exposed to recommended techniques of instruction and such other methodology, readings, et cetra, as the professor in charge of the course may require.

744 Law of Inkeeping for Graduate Students Fall or spring. 3 credits. Required M.P.S. course.
A review of fundamentals followed by an in-depth consideration of the legal aspects of the hospitality industry.

Properties Management Courses

251 Hospitality-Facilities Planning Fall or spring. 3 credits. Required.
Lecs, M W F 9:05; 2-hour lab to be arranged. D. Oswwald.
An introduction to both properties management and hospitality facilities. Components of the course include the protection and acquisition of architectural drawing, site analysis and planning, and hotel functional design. Laboratory emphasis is on basic graphic skills, including the layout of lodging and dining spaces, and the interpretation of construction drawings.

351 Hotel Mechanical and Electrical Problems I Fall. 3 credits. Prerequisite: H Adm 251. Required.
Lecs, M W F 11:15, 2-hour lab to be arranged. M. D. Stipanuk.
Investigation of management problems associated with the mechanical systems of the physical plant. Utility management and energy conservation are emphasized. Water, electricity, and lighting systems as well as sound and acoustics are covered. Basic engineering theory of each system is taught. Capital, operating, and repair and maintenance costs are stressed.
Food-facilities design in advanced applications.

A course designed to employ the basic concepts of food-facilities design in advanced applications. Emphasizes preparing a program, developing and critiquing equipment layouts, mechanical and electrical spotting, and equipment-detail drawings.

Fall or spring. 3 credits. Prerequisite: H Adm 352 or equivalent.

Lecs. M W 12:20; 2-hour lab to be arranged.

R. A. Compton

The construction, renovation, and maintenance of hotels and food-service operations are discussed and analyzed. Procedures, methods, and materials used in new construction projects are covered, as are repair, rehabilitation, and renovation of existing structures. Building codes, trade practices, materials, cost estimation, and management responsibilities are emphasized.

Fall or spring. 3 credits. Prerequisite: H Adm 352 or equivalent.

Lecs. M W F 12:20; 2-hour lab to be arranged.

R. A. Compton

The major electromechanical systems of large buildings and lodging properties are considered from a capital-cost versus operating-cost viewpoint. Topics include feasibility studies, functional planning and design, finance planning, the bidding process, construction contracts, project scheduling, and actual building construction. Techniques for effective graphic communication are developed and integrated into the design process.

Fall or spring. 3 credits. Required M.P.S. course.

Lec. T R 8:40-9:55; 2-hour lab to be arranged.

R. H. Penner

The hotel planning process, emphasizing program development, site selection, conceptual design, and building systems. Discussion of space allocation, hotel equipment, refrigeration, and air conditioning, the problems of capital expenditures, operating costs, and repairs and maintenance are stressed.

Fall or spring. 3 credits. Limited to 12 students.

Prerequisites: H Adm 351 and permission of instructor. Hotel elective. Estimated cost of optional field trip: $150.

M W F 9:05, R. A. Compton

The procedures followed in the planning of a restaurant facility. Primary emphasis is on design, engineering, and construction. Discussions of space allocation, 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.

Fall or spring. 1–3 credits. Prerequisite: written permission of instructor. Hotel elective.

Hours to be arranged.

The student who plans to be a teaching assistant in properties management is exposed to recommended techniques of instruction and such other methodology, regulations, etc., as the professor in charge of the course may require.

Fall or spring. 3 credits. Required M.P.S. course.

Lecs. T R 8:30-9:45; 2-hour lab to be arranged.

M. D. Stipanuk

The major electromechanical systems of large buildings and lodging properties are considered from a capital-cost versus operating-cost viewpoint. Topics include feasibility studies, functional planning and design, finance planning, the bidding process, construction contracts, project scheduling, and actual building construction. Techniques for effective graphic communication are developed and integrated into the design process.

Fall or spring. 3 credits. Required M.P.S. course.

Lecs. T R 8:30-9:45; 2-hour lab to be arranged.

M. D. Stipanuk

A review of the principles of English composition, through classroom interaction, case studies, debates, and individual and group videotaped presentations. 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.

Spring. 3 credits. Limited to 20 students.

Prerequisite: H Adm 351 or equivalent. Hotel elective.

R. T. 10:10. B. B. David

A course in electric touch-typing designed for students who can type but want to improve their speed and accuracy. Special emphasis is placed on the typewriter report as a form of communication. Business letters are typed in various styles, and their effectiveness is studied.

Fall or spring. 3 credits. Limited to 24 students.

Prerequisite: H Adm 161 or equivalent. Hotel elective.

M W F 12:20. B. B. David

Students who already know touch-typing develop sufficient speed and accuracy on electric typewriters to meet business standards for an executive assistant. The course involves practice in the typing and composing of business letters and special forms of business communication, including tabulated reports. Instruction in filing, duplicating processes, and machine transcription is provided.

Fall or spring. 3 credits. Limited to 20 students.

Prerequisite: a typing course. Hotel elective.

M W R 1:25, B. B. David

The basic theory of Gregg shorthand is covered. Shorthand is a personal tool used by business and professional men and women when taking notes, composing letters, and drafting speeches and reports. Dictation and transcription speed is developed to meet the needs of a stenographic position.

Spring. 3 credits. Limited to 24 students.

Prerequisite: H Adm 352 or equivalent. Hotel elective.

M R 1:25

263 Shorthand Theory. Fall or spring. 3 credits.

M W F 12:20. B. B. David

Written reports provide the information that people in organizations need to form judgments and make decisions. To succeed in its purpose of informing, analyzing, recommending, a report needs logical organization, appropriately developed material, and effective use of language. This course focuses on the knowledge and skills necessary to write successful business reports.

166 Continuing French: Le Français de l'Hotellerie (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.

Lecs. T 10:10, drills, M W F 10:10 or 11:15. N. Gaenslen, A. Levy

This course offers continuing study of the French language, in the context of business affairs, with specific emphasis on the hospitality industry. Presentation of material will consider cultural, geographic, economic, historical, political, and social contexts within which the business functions. The course will be conducted in French, emphasizing a conversational approach. Specialized vocabulary and terminology will be taught in a way that provides 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.

261 Report Typing. Fall or spring. 2 credits.

Limited to 34 students. Prerequisite: H Adm 161 or equivalent. Hotel elective.

R T 10:10. B. B. David

A course in electric touch-typing designed for students who can type but want to improve their speed and accuracy. Special emphasis is placed on the typewriter report as a form of communication. Business letters are typed in various styles, and their effectiveness is studied.

262 Typewriting and Business Procedures. Fall or spring. 3 credits.

Limited to 24 students.

Prerequisite: H Adm 161 or equivalent. Hotel elective.

M W F 12:20. B. B. David

Student already know touch-typing develop sufficient speed and accuracy on electric typewriters to meet business standards for an executive assistant. The course involves practice in the typing and composing of business letters and special forms of business communication, including tabulated reports. Instruction in filing, duplicating processes, and machine transcription is provided.

263 Shorthand Theory. Fall or spring. 3 credits.

Limited to 20 students.

Prerequisite: a typing course. Hotel elective.

M W R 1:25, B. B. David

The basic theory of Gregg shorthand is covered. Shorthand is a personal tool used by business and professional men and women when taking notes, composing letters, and drafting speeches and reports. Dictation and transcription speed is developed to meet the needs of a stenographic position.

265 Effective Oral Communication. Fall or spring. 3 credits.

Limited to 25 students a section. Required.

Lecs. M W F 10:10, 11:15, or 12:20 or T R F 9:05.

R 9:05. Individual conferences arranged throughout the term. F. A. Herman

This seminar is designed to help students (1) express themselves clearly and effectively and (2) acquire skills that will further their careers. The seminar is designed to meet the needs of a stenographic position.

Fall or spring. 3 credits.

Limited to 18 students. S-U grades only.

Hotel elective.

T 7:30-9:20 p.m. (every other W). J. S. Livingston

A review of the principles of English composition,
including organization, paragraph construction, sentence structure, and word choice. Students write papers and discuss them in individual conferences.

174 Information Systems Fall or spring. 3 credits. Required. M W 1 25 and W 1 30; 3-1-2. R. Alvarez. An introduction to information systems and computing machines. Students learn basic programming skills for application to selected business problems. The concept of file processing is introduced to provide the student with an understanding of how it applies to the hospitality industry. Programs are executed on the University's computing system.

274 Hotel Computing Applications Fall or spring. 3 credits. Prerequisite: H Adm 174 or equivalent. Hotel elective. Lecs, T 2 0-3-1. R 1 2-5. 2-hour lab to be arranged. R. G. Moore. The course exposes students to concepts of data-base management and management information systems as they relate to computing technology in the hospitality industry. Specific areas covered are hotel systems, wide-based reservations systems, communications, and food and beverage systems. Laboratories will provide actual experience with computer-based systems.

Science and Technology Courses

171 Food Chemistry I Fall. 3 credits. Required. Lecs, M W F 8, 1-hour lab on R to be arranged. M. H. Tabacchi. Principles and concepts of inorganic and organic chemistry, with emphasis on chemical reactions associated with fats, carbohydrates, and proteins. Heat transfer and energy as they relate to food chemistry are discussed.

172 Food Chemistry II Spring. 4 credits. Prerequisite: H Adm 171 or equivalent. Required. Lecs, M W F 8, 3-hour lab to be arranged. M. H. Tabacchi. The chemistry of fats, carbohydrates, and proteins is emphasized in relation to food products and food-production techniques. The roles of additives in food, collodial phenomena, food processing, and reconstitution techniques are studied.

173 Sanitation in the Food-Service Operation Fall or spring. 2 credits. Required. Lec, T 1 2-5. 2-hour lab to be arranged. B. Richmond. The causes and prevention of food spoilage and food-borne disease. Sanitary principles applied to the hospitality industry, including laws, rules, and regulations. Practice in general methods of microbiological testing, isolating and characterizing organisms of importance in the food-service industry.

174 Information Systems Fall or spring. 3 credits. Required. M W 1 25 and W 1 30; 3-1-2. R. Alvarez. An introduction to information systems and computing machines. Students learn basic programming skills for application to selected business problems. The concept of file processing is introduced to provide the student with an understanding of how it applies to the hospitality industry. Programs are executed on the University's computing system.

274 Hotel Computing Applications Fall or spring. 3 credits. Prerequisite: H Adm 174 or equivalent. Hotel elective. Lecs, T 2 0-3-1. R 1 2-5. 2-hour lab to be arranged. R. G. Moore. The course exposes students to concepts of data-base management and management information systems as they relate to computing technology in the hospitality industry. Specific areas covered are hotel systems, wide-based reservations systems, communications, and food and beverage systems. Laboratories will provide actual experience with computer-based systems.

Science and Technology Courses

171 Food Chemistry I Fall. 3 credits. Required. Lecs, M W F 8, 1-hour lab on R to be arranged. M. H. Tabacchi. Principles and concepts of inorganic and organic chemistry, with emphasis on chemical reactions associated with fats, carbohydrates, and proteins. Heat transfer and energy as they relate to food chemistry are discussed.

172 Food Chemistry II Spring. 4 credits. Prerequisite: H Adm 171 or equivalent. Required. Lecs, M W F 8, 3-hour lab to be arranged. M. H. Tabacchi. The chemistry of fats, carbohydrates, and proteins is emphasized in relation to food products and food-production techniques. The roles of additives in food, collodial phenomena, food processing, and reconstitution techniques are studied.

173 Sanitation in the Food-Service Operation Fall or spring. 2 credits. Required. Lec, T 1 2-5. 2-hour lab to be arranged. B. Richmond. The causes and prevention of food spoilage and food-borne disease. Sanitary principles applied to the hospitality industry, including laws, rules, and regulations. Practice in general methods of microbiological testing, isolating and characterizing organisms of importance in the food-service industry.

774 Computers and Hotel Computing Applications Fall or spring. 3 credits. Limited to 30 students. Required. M P S. course. Lecs, M 2 30-4 25. W 12 20; 2-hour lab to be arranged. R. Alvarez. The first segment of the course is devoted to learning computer concepts and programming in Basic. During the second part of the course, the introduction of the computing machine to the hospitality industry is examined from several viewpoints: managerial impact, cost justification, user reaction, and guest satisfaction. The various successes and failures of hotel computing systems are analyzed in detail. Students in the course will work with several small hotel and restaurant systems.

Economics, Marketing, and Tourism Courses

281 Microeconomics Spring. 3 credits. Required. M W 10 10, 1-hour sec to be arranged. C. W. Hart. Modern economic problems are examined in both historical perspective, as national issues, and in the economic context of business decisions.

282 Macroeconomics Fall. 3 credits. Required. T R 8 30-9 50. C. W. Hart. An analytical look at the basis of production and consumption behavior; market structures, the pricing system and elasticity of demand; and public policies directed toward these failures.

284 Introduction to Tourism Fall. 3 credits. Also open to students outside the Hotel School. Not open to freshmen. Hotel elective. T 1 2-5, R 3 0-4 25. M. A. Noden. An introductory course in the study of tourism. The origins and evolution of contemporary tourism will be carefully examined. Students will be familiarized with the various supply components of the tourism industry 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 case studies. A series of guest lectures by well-known experts from the travel industry will highlight the economic operating factors and effects of tourism in both the public and private sectors. This course will serve as the principal prerequisite for the advanced course.

285 Hotel Sales Fall or spring. 2 credits. Required. M W 2 30-4 25. Faculty. A practical approach to the selling of hotel space, with particular emphasis on selling to and effectively serving groups.

286 Advertising and Public Relations Fall. 2 credits. Limited to juniors, seniors, and graduate students. Hotel elective. F 11 15-1 10. Faculty. This is the first of two courses covering the essential phases of hotel-motel marketing. Topics include advertising, public relations, and sales communication.

382 Cases in Hospitality Marketing Fall or spring. 2 credits. Prerequisite: H Adm 283 or 751. Hotel elective. T 10 10-12 05. W. H. Kaven. A case-study course focusing on marketing planning, marketing strategy formulation, pricing, promotion, place, and product program design.

383 Managing the Marketing Functions in the Hospitality Industry Fall. 7 credits. Open to students. Required. H Adm 283, 384, or 781 or written permission of instructor. Hotel elective. T 2 30-4 25. W. Pigge. The course examines all marketing functions in the hospitality industry, including market research, public
relations, advertising, sales, and the techniques that management may use to monitor performance in each function.

384 Principles of Marketing  Fall or spring. 3 credits. Required.  
T R 8:30-9:45. L. M. Renaghan.  
The principles of marketing as they apply to the hospitality industry. The primary emphasis is on strategy development and consumer decision making. A secondary aim is to show how the special nature of services affects the development of marketing strategies in the hospitality industry.

481 Advertising Strategies  Fall. 7 weeks only. 2 credits. Limited to 50 students. Prerequisite: introductory courses in psychology and marketing or permission of instructor. Hotel elective.  
Case histories of the advertising, publicity, business promotion, and public relations of hotels, resorts, restaurants, and national travel attractions are studied.

483 Psychology of Advertising  Fall. 3 credits. Limited to 30 seniors and graduate students. Prerequisites: H Adm 111 and 384 or equivalent, or permission of instructor. Hotel elective.  
M 2:30-5 and 7-9:30 p.m. (every other M). P. C. Yesawich.  
The principles of psychology employed in advertising. Topics include learning, perception, motivation, advertising research, consumer behavior, and advertising strategy.

484 Tourism I  Spring 1984, spring and fall thereafter. 3 credits. Limited to 25 students per lab. Prerequisites: H Adm 281, 282, 264, and 384, or equivalents, or written permission of the instructor. Hotel elective.  
A. N. Noden.  
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. Economic 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. Occasional guest lectures will be given by experts in both public and private sectors.

489 T.A. Training in Economics, Marketing, and Tourism  Fall or spring. 1–3 credits. Prerequisite: written permission of instructor. Hotel elective.  
Hours to be arranged. Faculty.  
The student who plans to be a teaching assistant in economics, marketing, or tourism is exposed to recommended techniques of instruction and such other methodology, readings, et cetera, as the instructor in charge of the course may require.

589 Problems and Opportunities in International Hospitality  Fall. 2 credits. Prerequisite: an introductory course in marketing. Hotel elective.  
This course, taught from a marketing management perspective, will explore topics unique to international hospitality. Topics include: (a) the multinational corporation (MNC) and the hospitality industry: types, organization, trends, ownership; (b) working in the MNC: path, personality, pay, problems; (c) dealing with public relations and personal conflicts: human rights, terrorism, boycotts, and questionable payments; (d) examining global opportunities; (e) overcoming MNC marketing problems (e.g., very high or low airfares, repatriation, exchange fluctuations, expatriate visas, climate, operating style, work ethic, productivity, labor costs and standards, types and sources of demand). The course will include lectures from industry authorities, readings, appropriate cases, and discussion.

781 Marketing Management  Spring. 3 credits. Required M.P.S. course.  
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. 2 credits. Offered only to graduate students and upperclass students with written permission of instructor. Prerequisite: H Adm 781 or equivalent. Hotel elective.  
The application of strategic market planning concepts to firms involved in various aspects of the hospitality industry. Topics include the concept of corporate mission, using marketing concepts to establish corporate goals and objectives, techniques of analyzing businesses, 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

600–660 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.  
Faculty.  
Students pursue independent research projects under the direction of a faculty member.

600 Administrative and General Management

601 Management Intern Program I—Operations  6 credits.  
602 Management Intern Program II—Academic  6 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: permission of instructor. Obtain permission form from the school’s graduate office. Faculty.  
The student plans a project and selects a faculty member willing to supervise 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

800 Monograph I

801 Monograph II

802 Master of Science Thesis Research

803 Graduate Teaching Internship

900 Doctoral Thesis Research

Faculty Roster

Beck, Robert A., Ph.D., Cornell U. Professor of Hotel, Administration/Ecole Superieure des Sciences Economiques et Commerciales  
Berg, Florence, Ph.D., Cornell U. Asst. Prof.  
Chase, Robbert M., M.B.A., Cornell U. Prof.  
Christian, Vincent A., M.S., Cornell U. Villa Banfi Prof.  
Clark, John J., Jr., Ph.D., Cornell U. E. M. Statler Prof.  
Collucci, Antonio L., M.S., Purdue U. Asst. Prof.  
Demotry, Donal A., M.S., Cornell U. Prof.  
Dunn, David C., Ph.D., Cornell U. Assoc. Prof.  
Eyster, James J., Ph.D., Cornell U. Assoc. Prof.  
Ferguson, Dennis H., Ph.D., Cornell U. Asst. Prof.  
Gaurner, Paul L., M.S., Cornell U. Prof.  
Geller, A. Neal, Ph.D., Syracuse U. Assoc. Prof.  
Hart, Christopher W., Ph.D., Cornell U. Asst. Prof.  
Herman, Francine, M.S., Cornell U. Assoc. Prof.  
Kaven, William H., Ph.D., Cornell U. Prof.  
Kelly, Thomas J., M.S., Cornell U. Asst. Prof.  
Knight, John B., M.B.A., U. of Toledo. Assoc. Prof.  
Mukoski, Stephen A., Ph.D., Cornell U. Assoc. Prof.  
Pennier, Richard H., M.S. Arch., Cornell U. Assoc. Prof.  
Rainsford, Peter, Ph.D., Cornell U. Assoc. Prof.  
Redin, Michael H., Ph.D., Cornell U. Prof.  
Renaghan, Leo M., Ph.D., Pennsylvania State U. Assoc. Prof.  
Tabacchi, Mary H., Ph.D., Purdue U. Asst. Prof.  

Adjunct, Visiting, and Other Teaching Staff

Barnford, Carl, A.O.S., Teaching Associate  
Compton, Richard A., M.S., Senior Lecturer  
D'Aprix, David, B.S., Lecturer  
David, Betty B., Lecturer  
Degan, Melissa, A.O.S., Teaching Associate  
Flash, Dora G., A.B., Lecturer  
Hanson, Bjorn, M.B.A., Visiting Assoc. Prof.  
Heiss, Anne, M.S., Lecturer  
Lurnley, Jane, M.A., Lecturer  
McNeill, Keith, B.S., Lecturer  
Noden, Malcolm A., Lecturer  
Norius, Gregory X., B.S., Lecturer  
Nowis, Michael R. B.S., A.O.S., Lecturer  
O'Connor, Therese A., B.S., Lecturer  
Panaitides, Peter J., Visiting Assoc. Prof.  
Pigge, William, B.S., Visiting Assoc. Prof.  
Records, Harold A., M.B.A., Visiting Lecturer  
Richmond, Bonnie S., M.S., Lecturer  
Schmidt, Brian, B.A., Lecturer  
Scarnabba, Andrew B.B., Visiting Lecturer  
Shanahan, David M. B.A., Visiting Assoc. Prof.  
Solomon, Cathy, M.A.T., Lecturer  
Wierz, Steven, B.S., Visiting Lecturer  
White, Robert, A.O.S., Teaching Associate  
Whitehead, Donald E., B.S., 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 Cooperative Extension
Carol L. Anderson, assistant dean, associate director of Cooperative Extension
Carolyn Cook, director, alumni affairs
Brenda Brooker, director, admissions
Joyce McAllister, registrar
Clarence H. Reed, director, special educational projects
Timothy K. Stanton, director, Field Study Office
Lynne M. Wiley, director, Placement Office
Nevart Yaghjian, 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 physical plant includes administrative offices, faculty offices, classrooms, auditoriums, and lecture halls; a chemistry and biochemistry laboratories for nutrition, food science, and textile science; household equipment laboratories, experimental food laboratories, design studios, woodworking shops, a children's creativity 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 (human sciences, education, interior and product design, nutritional sciences), a historical costume collection, a human metabolic research unit, a research animal facility, cold rooms, a constant temperature and humidity laboratory, and an experimental nursery school.

Specialized equipment for teaching and research includes biochemical and chemical instruments for spectroscopy, chromatography, radioscopethat, electron microscopeultracentrifugation; physical testing equipment such as an instron, and cameras, videotape, and sound-recording equipment.

Degree Programs

<table>
<thead>
<tr>
<th>Degree Program</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology and Society</td>
<td>B.S.</td>
</tr>
<tr>
<td>Consumer Economics and Housing</td>
<td>B.S.</td>
</tr>
<tr>
<td>Design and Environmental Analysis</td>
<td>B.S.</td>
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<tr>
<td>Human Development and Family Studies</td>
<td>B.S.</td>
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<tr>
<td>Human Service Studies</td>
<td>B.S.</td>
</tr>
<tr>
<td>Nutritional Sciences</td>
<td>B.S.</td>
</tr>
<tr>
<td>Social Planning and Public Policy</td>
<td>B.S.</td>
</tr>
<tr>
<td>Individual Curriculum</td>
<td>B.S.</td>
</tr>
</tbody>
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The Students
The College of Human Ecology undergraduate enrollment is 1200, with 53 percent in the upper division. About 320 students are graduated each year: about 250 freshmen and 100 transfer students are admitted. About 100 faculty members serve as advisers for undergraduates. About 200 graduate students have members of the college's faculty advising 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. Admissions is selective; about 23 percent of the freshmen were in the top 10 percent of their high school graduating classes. Mean Scholastic Aptitude Test (SAT) scores for freshmen accepted in fall 1982 were 567 verbal and 604 mathematics.

Approximately 80 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 problems 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 also are permitted to extend their residency beyond the normal eight terms.

It is highly recommended that mature students contact Vivian Geller, the director of Continuing Education Information Center, 158 Olin Hall, for information on services available through that office.

Special Students

Students eligible for special status are those visiting from other institutions and interested in particular programs in the college; those with a bachelor's degree preparing for graduate study or jobs and careers in human ecology—related fields; or those who have interrupted their educations and are considering completing degree programs. Students accepted in the nondegree status of special student may enroll for a maximum of two semesters. During the second semester of attendance, a special student must either apply for admission as a transfer or plan to terminate studies in the college at the end of the semester.

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 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 can be done by registering through the Division of Summer Session, Extramural Courses, and Programs, 1121 Edens 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.

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. Talking with the advising coordinator can help match the student's needs with the special interests of a faculty member. Students are free to change advisers as their own interests change and should see the advising coordinator to discuss such a change. Faculty advisers are available to discuss course requirements 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 departmental resources.

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 sociology, 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 earlier a student decides 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.

Interdepartmental Major in Social Planning and Public Policy

The Department of Consumer Economics and Housing participates in the interdepartmental major in Social Planning and Public Policy with the Department of Human Service Studies. See the description of the major, p. 295.

Options

Two options are offered to undergraduates majoring in the department: consumer economics or housing. Either provides excellent preparation for employment in government, business, and continuing education programs such as cooperative extension. They also provide an excellent undergraduate foundation for future studies in law, economics, and business.

In addition to courses to be taken within the department, each option presents alternatives for the thorough development of a related interest.

Option I: Consumer Economics

Consumer economics is concerned with the economic behavior and welfare of consumers in the private and public sectors of the economy. How consumers allocate their scarce resources, especially

...
time and money. This option requires an understanding of the market economy, of consumers’ rights and responsibilities, and of household production, consumption, and management. Graduates may choose to work in government agencies providing consumer services, in business and industry, or in consumer-related community programs.

Option II: Housing

Housing, a major societal problem, is studied through an interdisciplinary approach that includes sociology and economics. The sociological approach considers the interplay between housing demand and population growth, and the economics of housing familiarizes the student with the operations of the housing market, including supply and demand, production and consumption, and finance. The role of federal, state, and local governments in designing and implementing housing policies is scrutinized. Careful analysis and evaluation of housing research are stressed.

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 individuals, families, and other groups as they affect and are affected by the space, objects, and materials around them.

Options are based on subject matter in:
1) Design—the manipulation of form, space, and color to solve aesthetic and functional problems;
2) The physical sciences—the chemical, physical, and structural properties of materials such as textiles and plastics; and
3) The social sciences—psychological, sociological, and managerial analyses of our relationship to the physical environment.

Diverse faculty backgrounds and teaching approaches lead to multidisciplinary problem solving and development of creative abilities, aesthetic judgment, and analytical thinking of students.

Laboratory and studio facilities permit exploration of textiles and other materials, and design concepts through analytical and creative problem-solving techniques. The relationship between humans and their surroundings is explored through a combination of academic courses, field experience, and applied research. Examples of student class projects, faculty work, and items from the Cornell Costume Collection are frequently on display in the department’s galleries and exhibit case. The DEA Resource Center includes books, journals, materials samples, and self-instructional videotapes for student use. Items from the Costume Collection are made available to students as necessary for classroom and special study projects.

All DEA majors are assigned a faculty adviser during their first semester by the advising coordinator, Anita Racine, 3M4 Martha Van Rensselaer Hall, on the mezzanine. Consultation with faculty advisers about future goals, department requirements, sequences of courses, and electives inside or outside the college to meet special needs helps students develop their programs.

Options

The department offers undergraduate education in five professional areas: 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 applied research management option with opportunities for more credits in the major fields than do the other two options. Transfer students 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 building 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, housing, and building technology. 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 approach that enables the student to integrate knowledge of design and environmental relations, and textiles in the apparel design process. Some students combine this option with option III. The program also serves to prepare 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

Students explore the chemical and physical structures and properties of textiles, textile products, and other materials. Supporting courses are found in physical sciences, design, human-environment relations, and consumer economics and housing. Some students combine this option with option II. The program gives excellent preparation for graduate study in many fields, including textile science and technology, business, public policy, consumer affairs, and apparel design.

Careers are available in the fiber and textile industries, government, and education. Recent graduates are active in new product development and evaluation, research, technical marketing services, consumer information, and product safety.

Option IV: Apparel and Textile Management

The fields of textiles and apparel, or textiles and interior design, 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 history, visual design, textile science, business management, human development, economics, and experiences in the field. Students learn to work effectively with professionals from a wide variety of disciplines, including textile science, design, manufacturing, and federal regulatory agencies, and retailing.

Option V: Human-Environment Relations

Human-environment relations focuses on the interaction between people and their physical surroundings. This option encourages students to combine an 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, lifestyle, 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 methodology and statistics are required. The applied research concentration in facility planning and management can open significant career opportunities immediately upon graduation, particularly in the private sector.

Electives that focus on business, space 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 and change throughout the entire life span. Of equal interest is the family as a context for individual development and as a part of the larger structure of society. An ecological perspective—the person in interaction with complex situational and environmental conditions of everyday life—is featured in many departmental courses.

Major social sciences disciplines concerned with the development of individuals and with the structure and function of families are represented among faculty members with backgrounds in psychology, sociology, history, and education. The department’s programs of instruction, public service, and research provide diverse opportunities for students to prepare for career development or to acquire the bases for graduate study. Many of the department’s majors are interested in medicine, law, counseling, clinical psychology, special education, or university teaching and research, which require some graduate study.

Others may take bachelor’s-level positions as youth counselors, day-care workers, personnel assistants, research technicians, or social program assistants. The department does not offer programs leading to teaching certification at any level.

The Curriculum

HDFS majors may take a broad and general program or a more specialized one. Areas of specialization available within HDFS include infant, child, adolescent, and adult development; atypical development; family studies; and social-personality and cognitive development. Some students combine an HDFS major with psychological or sociological concentration.

Human Development and Family Studies majors encourage students to combine an 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, lifestyle, 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 methodology and statistics are required. The applied research concentration in facility planning and management can open significant career opportunities immediately upon graduation, particularly in the private sector. Electives that focus on business, space 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.
An HDFS major also takes at least one second-level course in each of three areas: cognitive development, personality-social development, and family and society.

**Honors Program**

The Honors Program leading to a bachelor of science degree with honors in HDFS is designed to provide in-depth research experience for students interested in graduate school and to challenge students who enjoy research. Interested students should notify the director of the Honors Program during the second term of their sophomore year, although students may enter at a later date with special permission from the honors director.

A grade-point average of 3.5 is recommended for entry into the program, although promising students who lack the grade-point average also may apply if they can otherwise demonstrate their potential for honors work. Honors students must take a course in experimental research design before their senior year.

Students spend their senior year working on a thesis under faculty supervision, completing the project by the end of April. All thesis work must be completed by May, when the student’s oral examination is held. More information is available in the department chairperson’s office, NG14 Martha Van Rensselaer Hall.

**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, 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 option 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 practical use in the marketplace.

All HSS students take three core courses that together provide a knowledge base for understanding the community and community services, organizational behavior and group processes, program planning, and research analysis. Registries of their personal professional goals, students acquire an understanding of other professions, their commonalities and differences, and the ways they can collaborate to improve the human condition. Every student in the department is required to have a supervised field experience directly related to his or her career objectives.

The Department of Human Service Studies participates in the Interdepartmental Major in Social Planning and Public Policy with the Department of Consumer Economics and Housing. In this major the students acquire knowledge and skills to assess local and regional needs and to develop, implement, and evaluate policies and plans for meeting those needs and to learn to work as professionals in state and local agencies. (See the section on Interdepartmental Major in Social Planning and Public Policy).

**Academic Advising**

The curricula in HSS are demanding; each of the HSS options requires breadth and depth in several areas. The core courses (HSS 202, HSS 203, and HSS 292) must be taken in the freshman and sophomore years, and prerequisites for each of the options should be completed before the junior year, if possible. (Special provisions are made for junior transfers.) Each student must have a practicum supervised by an HSS faculty that is tied directly to his or her professional preparation.

It is important for a student who is interested in majoring in human service studies to declare that major and select an option as early as possible. Once the major is declared, the departmental advising coordinator, Edythe Conway, assigns an adviser from the HSS faculty. A student who is unsure about which option to pursue should talk with a faculty adviser. With judicious planning, opportunity to change options or the major can be built into the program. When an option is changed, the student is reassigned to an appropriate adviser for that program. Students are free to change advisers. Although advisers must sign the green schedule card during course enrollment each term, it is the student’s responsibility to keep track of his or her courses and to make sure that the program meets graduation requirements for the major and the college.

**Options**

Two options are available in the department: (1) human ecology education and (2) social work.

Students who elect the option in human ecology education focus on the educator’s role in a variety of organizational settings (schools, cooperative extension, social and government agencies, and business) with learners of all ages. Students may choose to emphasize education in community agencies and the teaching of home economics in a school or a nonschool setting. Students who wish to teach home economics in schools (kindergarten through twelfth grade) select a sequence of courses that meet New York State certification requirements.

Students who pursue the accredited social work option are prepared for entry-level jobs in social work and are eligible to apply for a year’s advanced standing in graduate schools of social work.

**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 populations; community centers; continuing education centers; and business and government agencies.

Course work combines a liberal education with professional preparation. Students acquire an understanding of the social processes and influences that affect individuals and their families, human development, and decision making. Students who wish to teach home economics in schools select a sequence of courses that lead to certification as a home economics teacher in New York State or in another state. This certificate is exchangeable for a provisional certificate when the student takes a home economics teaching position. 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 should investigate 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, and the student 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.

**Design and the near environment**

explores the relationship 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 physiological needs; 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. Areas of focus include 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 and programs available to these individuals and their families.

**Career clusters.**

In addition, students select one of the following career clusters: cooperative extension, media and computer technology, target populations, or teacher certification in home economics. By choosing a career cluster students focus the selection of courses and electives 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 basic disciplines or other departments, tutorials, fieldwork, and research.

**Human ecology education**

The Department of 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 career, economic, psychological, and sociological service. Classes explore the special requirements of each. Most can be met by making careful choices of electives.

**Internship**

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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 curriculum is based on the biological and social sciences, the humanities, and three core courses in the department, HSS 202, HSS 203, and HSS 292. These requirements are generally completed during freshman and sophomore years.

The legislative trend in the United States that is moving public policy development from the federal to the state and local levels emphasizes the need for trained personnel in social planning and public policy. The Interdepartmental Major in Social Planning and Public Policy is designed to meet this need. The program is sponsored jointly by the Departments of Consumer Economics and Housing, and Human Service Studies.

Students increase their knowledge of (1) the historical development of, and the current issues in, social planning and public policy; (2) the ways policies and plans are formed, implemented, evaluated, and changed; (3) social systems, from the structure and functioning of contemporary society to the dynamics of individual and group behavior; and (4) values that help foster and maintain some policies and plans rather than others.

Students electing this major have opportunities to improve their skills in policy analysis, evaluative research, developing information systems, engaging consumers in the planning and policy-making process, and budgeting. The foci on policy and planning also make this major very attractive to students wishing to use it as a prelaw or pregraduate business program.

Faculty advisers whose interest and experience lie in the fields of social planning and public policy are available to counsel students on career goals and to help plan curricula.

Advising coordinators Keith Bryant and Alan Hahn will be glad to answer questions about the advising system.

**Options**

Two options are available in the major, a student selecting one option is subject to the following grade requirements and career plans and completes the necessary requirements. Either option prepares a student for graduate or professional study.

**Option I: Social Planning.** The option in social planning prepares students for careers in planning the organization and delivery of human services. Social planners are employed in local, regional, and state planning agencies and assist public and private health and social agencies in the design, development, and evaluation of regional and local programs.

**Option II: Public Policy.** This option is planned for students who are primarily interested in the evaluation of public policy alternatives, especially implications of these policies for consumers and households. Graduates may build careers as researchers or policy analysts in planning departments or other public or private agencies at the local, regional, state, or federal level in areas related to housing, welfare, income and employment, or consumer affairs.

The social-work curriculum is based on the biological and social sciences, the humanities, and three core courses in the department, HSS 202, HSS 203, and HSS 292. These requirements are generally completed during freshman and sophomore years.

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**Individual Curriculum**

Students in the college who find that none of the major curricula meets their educational objectives may wish to investigate designing their own program of study. An individual curriculum must be within the focus of the college and must be better suited to a student's objectives than an existing major. The individual program must include at least 40 credits in human ecology courses and may not exceed the normal number of credits allowed in the endowed divisions of Cornell.

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 always before the second semester of the junior year.

If objectives meet the requirements, the student should discuss plans with a counselor. If an individual curriculum seems a possibility, Barbara Morse, in the Counseling Office, will help the student formally develop a program.

**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 or 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, New York City, Albany, Washington, D.C., 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, and through occasional intercession study tours. In addition, opportunities to study abroad, as well as cooperative arrangements between the College of Human Ecology and overseas universities, enable students to undertake foreign study as an integrated part of their Cornell program. Course work in the foreign institution will, in general, be planned to increase knowledge of the people and institutions of the country concerned; field work will provide guided experience in family, community, or agency situations in an area related to individual student interest in human ecology. A core course in the college, HE 300, Preparing for International or Intercultural Experience, assists students in developing the skills necessary for effective cross-cultural interaction and enables students to become oriented to the nations, regions, and cultures in which they intend to work and study. Interested students should contact the International Program Office in 153 Martha Van Rensselaer Hall.

**University Programs**

**Africana Studies and Research Center**

Courses taken in the Africana Studies and Research Center (ASRC) may be used to meet some of the distribution requirements of the college. Up to two courses or 8 credits of such courses may be applied toward the 12 additional credits in natural and social sciences (Section I-C of the graduation requirements) or toward the 9 additional credits in communication, analysis, and the humanities (Section II-B). This allowance is in addition to the Freshman Seminar.
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 pay regular tuition to Cornell and only special fees to Ithaca College, if any are charged. Students are allowed to register for one course a term and may take no more than 12 credits in four years. Exceptions will be granted to Cornell students enrolled in methods-and-practice teaching courses at Ithaca College.

Cornell students are eligible to register only in Ithaca College courses that are relevant to their program and that do not duplicate Cornell courses. Acceptance of Cornell students into Ithaca College courses is on a space-available basis. Participation in this program is not guaranteed, and Ithaca College has the right to accept or reject students for any reason it deems appropriate. The program is available only during the fall and spring semesters.

For further information students should contact Joyce McAllister, 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 interdisciplinary majors. Selecting a major means choosing one option in one department. Although a student may satisfy the requirements of 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 the credentials they file in the Placement Office and to seek recommendations from faculty associated with the options completed.) 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): cognitive, personality, and social development; infant development; and family studies.
- Human Service Studies (HSS): human ecology education, social work.
- Nutritional Sciences (NS): experimental and consumer food studies, nutrition, nutritional biochemistry, clinical nutrition, community nutrition.
- (By careful planning, students may also meet the minimum academic requirements of the American Dietetic Association.)
- Interdepartmental Major in Biology and Society (ID-BS).
- Interdepartmental Major in Social Planning and Public Policy (ID-SPPP): social planning, public policy.
- Individual Curriculum: It is possible to develop an individual program of study if none of the above programs fit 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 a Major

A summary 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, centers, and special programs numerous; the fields of study almost unlimited. Counselors and department advisers are available to discuss which courses may interest students and round out their educations.

Students should consult the index of this announcement for information on where different subjects are taught in the University. Some subjects are taught in more than one division of the University.

Foreign Language Study and Placement

Students who studied a foreign language before coming to Cornell and who want to continue must take either the College Entrance Examination Board (CEEB) achievement test in that language or a departmental language placement test. The latter is given during orientation week in September and again in December, January, and May. Students in human ecology who plan to work with non-English-speaking people in this country or overseas often find it necessary to be proficient in another language. For more detailed information, see the Advanced Placement of Freshmen section.

Graduation Requirements

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,
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)


B. Social Sciences (6 credits) selected from economics (including CEH 110, 111), but excluding Agricultural Economics 221 and 310;
psychology (including Education 110, 311, 317; DEA 150; and HDFS 115, 116, 117); sociology (including rural sociology, CEH 148, and HDFS 150 and 307). Do not take Economics 101 and CEH 110, Economics 102 and CEH 111, or Psychology 101 and Education 110, they are equivalent courses.

C. Additional credits (12 credits) selected from any subjects listed above or with courses in anthropology (except archaeology); Astronomy 101, 102, and the humanities include: biological sciences; chemistry; 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 (6 credits) selected from art; communication arts: comparative literature; computer science; drawing; English, ancient or modern foreign languages, history; history of art; history of architecture; mathematics; music; Natural Resources 407; philosophy; statistics (students should not take both I&LR 210 and Agricultural Economics 310, since the courses are substantially the same); theatre arts; DEA 101 or 115; or HSS 292.

III. Human Ecology
(40 credits)

A. Requirements for the major (the number of credits required varies by major and option)

B. Course work in at least two departments outside the major (15 credits) including at least 6 credits or two courses in one department outside the major.

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 course work in at least two departments outside the major. A semester-long college-level course in the appropriate science is considered equivalent to a year of high school science, subject to a minimum of 6 credits in courses in English composition or in instruction in writing equivalent to that offered in the Freshmen Seminars. Students who do not fulfill this requirement before transferring must fulfill it at Cornell.

Section II-A. Transfer students should have taken at least 6 credits in courses in English composition or in courses requiring substantial writing and oral 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 II-B. Students entering 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 allowed to meet this requirement), based on 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 with two courses or 6 credits in one department.

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

Section II-A. Students who receive credit from the advanced placement examination in English are still held for the Freshman Seminar requirement.

In sections I, II, and III, the required credits listed are the minimums, credits taken in excess of those minimums (section I, 24 credits; section II, 15 credits; and section III, 40 credits) count toward electives (section IV, 41 credits).

In sections I and II, courses specified by the major to meet the requirements in these sections may either be used as meeting the credit requirements in these sections or be applied toward the additional credits in section IV.

In sections I, II, and III-B, students are permitted to lack 1 credit toward meeting the requirements. For example, 14 instead of 15 credits of human ecology courses may have been taken outside the major department, or 23 instead of 24 credits of courses in the natural and social sciences may have been taken, however, the minimum total of 120 credits (exclusive of physical education) must be met.

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. If Economics 101, 102; Psychology 101; Sociology 101, 107 are selected to meet requirements for section I, credits in the endowed divisions allowed for section IV will be reduced accordingly. Any course taken in an endowed division for which a grade of F or U is received will also 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 may be taken in the endowed divisions of the University except under both of the following conditions:

1) The students 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 credits are passed. In 1983–84 the fee will be $210 per credit.

Related Policies for Transfer Students

Natural sciences. Transfer students entering before spring 1983 who lack preparation in biology and either chemistry or physics, either at the high school or college level, must make up this deficiency before registering for their third semester in the college. Deficiencies may be made up either through successful completion of Cornell courses or courses taken elsewhere at the high school or college level. A semester college-level course in the appropriate science is considered equivalent to a high school unit and counts as credit toward graduation requirements.

Effective spring 1983, students applying as undergraduates who do not have the required academic unit in biology, chemistry, or physics are required to show evidence of having made up this deficiency prior to matriculation in the college.

Section I-A. Transfers who are entering human ecology programs in consumer economics, housing, social planning, public policy, 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 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 oral 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 allowed to meet this requirement), based on 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 with two courses or 6 credits in one department.

Note that transfer students are still responsible for completing a total of 40 human ecology credits.

Section IV. Transferred credits for courses applied toward electives do not reduce the 21 Cornell endowed credits that students are allowed. Any 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 or postponement from physical education, students should consult the college registrar, Joyce McAllister, in 146 Martha Van Rensselaer Hall.

Related Policies for Freshmen

Natural sciences. The college recommends that freshmen entering before spring 1983 complete a unit of biology and either a unit of chemistry or physics before they matriculate. Entering freshmen who lack a unit of biological or physical science must make up this deficiency before they register for their fourth semester. A semester-long college-level course in the appropriate science is considered equivalent to a high school unit and counts as credit toward graduation requirements.

Effective spring 1983, students applying as undergraduates who do not have the required academic unit in biology, chemistry, or physics are required to show evidence of having made up this deficiency prior to matriculation in the college.
Section V. Freshmen are required to take two semesters of physical education during their freshman year.

Residency Requirements
All college curricula are planned to fit within an eight-semester program. An average schedule of 15 credits—nine in the fall term and six in the spring—(inclusive of physical education) is considered standard, and if pursued for eight semesters will provide the credits needed for graduation. If the student completes all the requirements—for the major, for distribution, for total credits, and for cumulative average—in fewer than eight semesters, the degree may be conferred at the end of the semester in which the last requirements are completed. Students who receive their degree early should notify the registrar at the beginning of the semester so that their summaries of record may be prepared and their names placed on the list of degree candidates.

Students sometimes enter the college with 15 transfer credits or more and need an additional semester to complete a program. To register for a semester beyond the eighth, the student submits a written request to the director of special educational projects. The request should specify the full name of the student wanting to enroll for the extra semester and include a list of courses planned for the additional semester. Such requests are usually granted when there appears to be no feasible way for the student to complete the professional curriculum or the degree requirements without the extra semester.

Freshmen entering the college with 15 transfer credits have seven semesters in which to complete the degree. Transfer students must complete at least 60 credits at Cornell.

Exemptions from Requirements
Students who want an exemption from a specific graduation or major requirement may petition the director of special educational projects. Approval may be given under certain circumstances. For example, transfer students may have problems scheduling courses to meet college distribution requirements, and the director of special educational projects may approve alternative courses. If the requirement for which the student seeks exemption is one specified by the major, the director of special educational projects will refer the petition to the department for consideration. Petition forms are available in the Counseling Office, N101 Martha Van Rensselaar Hall.

Procedures

Course Enrollment
Students are expected to complete course enrollment during the weeks immediately before or during the first two weeks of 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 keep track of the dates for course enrollment.

Before or during course enrollment, students talk to a departmental 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 yet 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 Rensselaar Hall. Students will also need the Course and Time Roster, issued by the Office of the University Registrar each semester before course enrollment.

Since new students starting at midyear do not have an opportunity to enroll in courses until after they arrive on campus, the college tries to reserve places for them in human ecology courses. A student who requests a specific course and receives a confirmation of time for enrolling in such courses is listed on the schedule given to all new students. For the first three weeks of the term, new students have an opportunity to add or change courses in other divisions of the University as well as in human ecology.

Requests for course enrollment may be approved by the major faculty adviser or by a college counselor if circumstances are completely beyond the student’s control. If the student requests an additional semester to complete a major, the request must be approved by the appropriate faculty advisor. The request form should detail the reasons for wanting to enroll for the additional semester.

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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 resulting from errors are described below 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 $30 penalty during the first three weeks. The late-registration fee is increased by $10 each week for the fourth, fifth, and sixth weeks and $25 for each additional week beyond. Late University registration is held during the first three weeks of the term. After the first week of classes, students must also have the written permission of the college registrar before they will be allowed to register in the University. After the third week of classes, students registering late must also have the written permission of the Office of the University Registrar in addition to the written permission of the college registrar and pay the $25 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 changes may be made with the permission of the instructor and payment of a $10 processing fee.
- After the seventh week of the term, no course change may be made without petitioning for approval. Petitions are usually granted only in circumstances where a 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 course will remain on the official transcript.
- After the third week of the term, instructors have the right to consider students' requests for course changes on an individual basis or to announce at the beginning of the term that they will not approve any change requests beyond the third week of the term.

Procedures

Students who need to make course enrollment changes should make them as soon as possible. It is to the student's advantage to add the desired courses as soon as possible, and it is helpful to other students if unwanted courses are dropped promptly.

Students should assess their work loads carefully at the beginning of each term. If in the first week or two the instructors do not discuss the amount of material to be covered and the extent of assignments, students are advised to ask about course requirements.

Some of the same procedures are required for course enrollment changes as were necessary for course enrollment—for example, permission of the instructor must be obtained for a course requiring it, and the same forms for special studies courses must be filled out. In addition to the procedures listed below for course enrollment changes, all course change forms for out-of-college work taken must be signed by the departmental faculty adviser.

Specific procedures for making course changes during the change-of-enrollment period (first three weeks of classes) are listed below. The student should:

1) Obtain an optical-mark course change form from the Office of the Registrar or from the Counseling Office.
2) Fill out 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 or to remove his or her name from the class list for a course being dropped. That person should sign the optical-mark course change forms in the appropriate place.
4) Turn all signed forms in to the Office of the College Registrar, including the forms for out-of-college courses. Enrollment cannot be officially changed until the signed forms are filed in the registrar's office. For example, if 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 these copies in case they are needed to verify later that the forms were filed.

A student who wants to have his or her name placed on a waiting list for a human ecology course should be aware that such lists are compiled during the change-of-course-enrollment period on a first-come-first-served basis, without regard to seniority or other factors. Students must check their status on the waiting lists in person every forty-eight hours, and if space has not opened up, request that their name be removed from the list of enrolled students for a course unless circumstances have prevented them 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 for human ecology courses 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.

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 standing and must apply for permission in advance from the college registrar. Credit for work done 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.

A $15 fee is charged to bind a student's in-absentia registration. If the in-absentia study is undertaken during the summer, the $15 fee is charged only if the summer study is for more than 8 credits. A form is included with the letter sent to the student, giving permission to study. This form must be completed and returned to the Office of the College Registrar, 148 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: 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 director of special educational projects, 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 obtained.

Students are responsible for having the registrar of the institution where they study in absentia send transcripts of grades to the Office of the College Registrar at Cornell. The student's transcript can then be officially assessed and applied toward the Cornell degree. Only credits (not course names and grades) for study in absentia appear on the Cornell University transcript.

A student who holds a Regents or Children of 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.

The rules regarding study in absentia apply to transfer students with the additional stipulation that at least 60 credits must be taken at Cornell. At least 40 of the 60 credits must be in the College of Human Ecology at Cornell unless the student has transferred equivalent human ecology credit. (No more than 60 credits of equivalent credit may be applied to the 40 credits required in human ecology coursework.)

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 student decides to take a leave of absence, a counselor will provide the necessary forms to staff which should be taken to the Office of the College Registrar, where the official leave will be processed.

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 then 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.

A $15 fee is charged to bind a student's in-absentia registration. If the in-absentia study is undertaken during the summer, the $15 fee is charged only if the summer study is for more than 8 credits. A form is included with the letter sent to the student, giving permission to study. This form must be completed and returned to the Office of the College Registrar, 148 Martha Van Rensselaer Hall, along with a check for $15, before the student is officially registered in absentia.

Procedures 299
Requests for leaves 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 approval 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 when the student should return under warning, 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 Admissions 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 find out if the petition has been granted or denied by checking his or her mail folder in the foyer.

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 more than 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 completing the petition, 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 or the director of special education projects.

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, a U is 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 a grade of S may be counted toward 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 the fall semester; 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 Freshman 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 first week of the term. After the third week of the term, students must petition the college registrar to change an S-U grading form. 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, in the instructor's judgment, there was a valid reason. A student with such a reason should discuss the matter with the instructor and request an INC. A grade of INC remains permanently on a student's official transcript even after the work is completed and a final grade recorded.

A student who receives an INC in a course may be permitted to complete the course with a summer in which to complete the work and receive a regular grade; if the work is not completed by that time, the INC remains on the record, and no credit is given for the course.

When a student wants to receive a grade of INC, a conference should be arranged with the instructor (preferably before classes end and the study period begins) to work out the agreement. A form, called Explanation for Reporting a Final Grade of F or Incomplete, which has been signed by both the instructor and the student, must be submitted by the instructor. This form is submitted with the final grade sheets whenever an incomplete is given.

This form is for the student's protection, particularly in the event that a faculty member with whom a course is being completed leaves campus without leaving a record of the work completed in the course. If circumstances prevent a student from being present to consult the instructor, the student 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 is 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 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 each semester by placing on the Dean's List the names of students who have completed satisfactorily at least 12 academic 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 cumulative average of at least 2.0 and having earned at least 20 percent of the junior class may be elected to membership, and not more than 10 percent of the senior class may be elected. Graduate students nominated by faculty members may be elected.

Bachelor of Science with honors recognizes outstanding scholastic achievement in an academic field. Programs leading to a degree with honors are offered to selected students by the Department of Human Development and Family Studies and the Division of Nutritional Sciences. Information about admission to the programs and their requirements may be obtained from the appropriate department or division.

Bachelor of Science with distinction recognizes outstanding scholastic achievement. Consideration will be given to seniors whose academic standing at the end of seven semesters is in the top 10 percent of the graduating class. The honor is conferred on those seniors who are in the top 5 percent of the class after grade-point averages have been adjusted by including grades for transfer work and after grades earned in the fifth, sixth, and seventh terms have been given double weighting in the final average. The graduating class includes students who will complete requirements for Bachelor of Science degrees in January, May, or August of the same calendar year.

To be eligible for consideration, transfer students must have completed 45 credits at Cornell. In determining the academic standing of a transfer student.
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; S-U grades only. Fall and spring: sec. T 11:15-12:35, 12:45-1:55; Wed. 8-10 a.m., 11 a.m.-1 p.m.; sec. W 11:15-12:35, 12:45-1:55. The course is based on analysis by the humanities, social sciences, natural sciences, and religious studies.

Interdepartmental Courses

Fall or spring. Credit to be arranged. S-U grades optional. Limited to students recommended by their department chair and approved by the assistant dean for student services. Hours to be arranged. Staff.

Field Study Office

T. Stanton, director; D. Giles, M. Holzer, M. Whitham

100 Orientation to Field Study: Skills for Learning in the Field Fall or spring. 2 credits. Limited to 15 students per section. Prerequisites: permission of instructor. Fall or spring. 3 credits. Credit to be arranged. S-U grades optional. Workshops train students in skills that will help them become more effective field learners and better able to cope with the complex demands of a field placement. Topics include cross-cultural communication, participant observation, investigative interviewing, understanding nonverbal communication, identifying sources of information in the community, and analyzing verbal presentations. All of the concepts are applied to assignments in the field.

200 Preparation for Fieldwork: Perspectives in Human Ecology Fall or spring. 4 credits. Limited to 25 students a section. Prerequisite: permission of instructor. Fall or spring. 3 credits. Credit to be arranged. S-U grades optional. Introduces students to field skills (such as interviewing, observation, public speaking, and leading discussion) and provides opportunities to practice and develop those skills. Additionally, small student task forces consider case studies highlighting complex issues at local, community, state, and national levels. Students work together to define problems, analyze and synthesize data from a variety of sources, and make group presentations.

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. S-U grades optional. Limited to graduate students recommended by their chairperson and approved by the assistant dean for student services and the member of the staff in charge of the problem for independent advanced work. Hours to be arranged. Staff.
and writing. Academic credit is awarded for this integration of theory and practice. Credit is variable to allow for combined departmental and interdepartmental sponsorship and supervision.

Information on placement opportunities is available in the Field Study Office, 159 Martha Van Rensselaer Hall. Students should begin planning at least a semester in advance for field study.

403 Teaching Apprenticeship
For study that includes assisting faculty with instruction.

406 Sponsored Field Learning or Internships
Fall, spring, 0 credits. S-U grades optional. UP grades optional for up to 12 credits. Limited to 15 students, intended for juniors and seniors. Prerequisite: ID 200. Enrollment by permission of instructor. Applications are due in the Field Study Office during the preceding semester’s course enrollment period.

Hours to be arranged. M. Stanton.

A course for students seeking interdepartmental sponsorship and supervision of participation in structured, off-campus experiences or internships operated by non-Cornell or non–credit-granting institutions or agencies. Examples include New York State Assembly Internship Program, the Washington Chips arranged independently by students with individual public or private organizations or institutions. Field supervision, largely carried out through biweekly correspondence, is aimed at students’ work-and-study assignments while on their internships and at enabling students to gain an in-depth understanding of how their internship organization operates and the internal and external ecological forces that influence it. Completion of course requirements is signified by a formal presentation to the college community upon return to Cornell (graduating seniors may make special arrangements). Credit is variable to allow students to design interdepartmental and departmental sponsorship and supervision.

Information on course enrollment and internship opportunities is available in the Field Study Office, 159 Martha Van Rensselaer Hall. Students should begin planning more than one full semester before leaving campus for an internship.

407 Field Experience in Community Problem Solving
Fall or spring. 6–15 credits. Limited to 25 students, intended for juniors or seniors. Prerequisite: ID 200. Enrollment by permission of instructor. Applications due in the Field Study Office during the preceding semester’s course enrollment period.

Supervision of all projects is provided jointly by the course instructor and appropriate agency personnel. In addition, each project is subject to review twice during the semester by an oversight committee composed of community and faculty representatives with relevant expertise. Completion of the course is signified by formal presentation of project results to the contracting organization’s staff, board of directors, or other appropriate administrative units, and members of the oversight committee, together with submission of an academic analysis of the implementation process to the course instructor. 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.

408 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. Enrollment by permission of instructor. Applications due in the Field Study Office during the preceding semester’s course enrollment period.

A full-semester, off-campus field course in New York City, designed to help students begin to understand how organizations function within an urban setting, while at the same time understanding the urban context and the people who live within it.

Students work 3½ days a week in field placements that can represent every sector of the urban environment. Field experience is required through papers and meetings with site supervisor and field instructor. As a unifying theme, students participate in small group presentations covering current issues in New York. Recent topics have been the New York City fiscal crisis, the energy crisis, Reaganesia, and women and work.

Students may enroll in ID 408 for 9 to 15 ID and 0 to 6 departmental credits, depending on departmental regulations. Information on these policies and on ID 408 placement is available in 159 Martha Van Rensselaer Hall. Students should begin planning at least one full semester before they apply to ID 408.

409 The Ecology of Organizations in the Upstate Region
Fall or spring. 3–15 credits. Limited to 25 students. Prerequisite: ID 200. Enrollment by permission of instructor. Applications are 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. M. Whitman.

A variable-credit, Ithaca-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. Credit is variable to allow students to arrange for combined interdepartmental and departmental sponsorship and supervision.

Information on placement opportunities is available in the Field Study Office, 159 Van Rensselaer Hall. Students should begin planning at least a semester in advance for field placement. Information on field placement is available at the Field Study Office during preregistration of the term prior to field placement.

Toxicology
699 Special Topics in Toxicology (also Toxicology 699)
Fall or spring. 1–3 credits. S-U grades optional.

Hours to be arranged. Staff.

A discussion of the most current developments in various areas of toxicological research and testing. Faculty and students will participate jointly in evaluating research articles, providing 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).

Consumer Economics and Housing Courses

110 Introduction to Consumer Economics I Fall. 3 credits. S-U grades optional. Students who have taken Economics 101 or another introductory microeconomics course should not register for this course.

M W F 9:05. P. Zorn.

Principles of microeconomics with an emphasis on applications to consumers, household economics, and housing. Introduction to the concepts of opportunity cost, time as a resource, consumer demand, production, market failure, and the impact of government regulation of the market on consumers.

111 Introduction to Consumer Economics II Spring. 3 credits. S-U grades optional. Students who have taken Economics 102 or another introductory microeconomics course should not register for this course.

M W F 11:15. J. Robinson.

This course introduces students to the issues and concepts in macroeconomics. 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 money, 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 R 10:10; secs, M 9:05 or 2:30; (2) T 11:15, W 10:10 or 2:30. A. Shlay.

An introductory sociological course analyzing the determination of housing need 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 8:30–9:55. E. S. Maynes.

A study of marketing functions, institutions, policies, and practices, with special emphasis on consumer satisfaction. (N. Saltford may direct an optional marketing project with a nearby consumer products firm under the designation of CEH 401, 2 credits; W 7–9 p.m. Permission of instructor is required for participation in the project.)
325 Economic Organization of the Household
Spring. 3 credits. Prerequisites: CEH 110 or equivalent. S-U grades optional. M W F 10:10-11:15. E. G. Genov. The study of economic organization of the household 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 economic goals, the role of credit and the need for financial counseling, economic risks and available protection, and alternative forms of saving and investment.

332 Consumer Decision Making
Spring. 3 credits. Prerequisite: CEH 110 or permission of instructor. T R 10:10–11:25. E. S. Maynes. This course uses decision tools to help students make more effective choices as consumers through an understanding of the economy and the use of relevant economic and statistical principles. The course is normative, stressing how consumers should act in order to achieve their goals.

341 Fundamentals of Housing Economics
Spring. 3 credits. Prerequisites: CEH 110–111 or equivalent. S-U grades optional. T R 8:30–9:55. P. Zorn. This course discusses the microeconomics of housing markets, with emphasis on the factors affecting the demand and supply of housing. It will focus on the role of housing within an urban economy. Topics include income taxes and housing, tenure choice, house depreciation, elasticity estimation, house price determination, and models of urban housing market dynamics. The course seeks a blend of economic theory and empirical studies of housing economics.

355 Wealth and Income
Fall. 3 credits. Open to sophomores, juniors, and seniors. Graduate students may elect to audit and write a research paper for one to two credits under CEH 600. Prerequisites: CEH 110–111 or equivalent. S-U grades optional. M W F 9:05. W. K. Bryant. Examination of contemporary economic problems that affect the American family. Examples are affluence and poverty, monetary and fiscal policies as these affect families, and efficacy of the delivery of public services in the areas of health, education, and subsidized housing. Where relevant, the historical origins of these problems will be studied.

400–401–402 Special Studies for Undergraduates
Fall and spring. Credits to be arranged. Hours to be arranged. Staff. Special arrangements for course work to establish equivalency for courses not transferred from a previous major institution. Students prepare a multiplicity of description of the study they want to undertake, on forms 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 and spring. 3 credits. S-U grades optional. Limited to 35 students; not open to freshmen; preference given to graduate students. T R 2:30–4. A. Davey. A systems approach identifies and analyzes components of family management. The focus is on the contribution of management to the improvement in family living. The Personalized System of Instruction format permits self-paced learning.

315 Personal Financial Management
Fall and spring. 3 credits. Limited to 200 students. Preference given to human ecology juniors, seniors, and transfer students. T R 2:30–4. J. Robinson. Spring: M W F 1:25. P. Chi. 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 economic goals, the role of credit and the need for financial counseling, economic risks and available protection, and alternative forms of saving and investment.

401 Empirical Research
For study that predominantly involves library research and independent reading.

402 Supervised Fieldwork
For study that involves on-the-job experience through discussion, reading, and writing. Academic credit is awarded for this integration of practice and theory.

411 Time as a Human Resource
Fall. 3 credits. Prerequisites: one course in sociology. Recommended: one course in microeconomics. S-U grades optional. T R 10:10–11:25. R. Heck. 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 and economic forces.

427 Consumer Economics and Housing Courses 303

Consumer Economics and Housing Courses 304

431 Consumer Behavior
Fall. 3 credits. Open to seniors and graduate students. Prerequisites: CEH 110 or equivalent. T R 12:20–2:15, T R 12:20–1:10 (graduate students). S-U grades optional. R. 12:25–2:15 (undergraduates). E. S. Maynes. This course applies the concepts, models, and research techniques of behavioral sciences to the explanation and prediction of consumer behavior. The student is exposed to representative theories, models, problems, and research techniques. Special emphasis is made to ensure that students encounter problems approached from both seller and consumer viewpoints as well as from the disciplines of economics and social psychology. Once a week graduate and undergraduate students meet in separate sessions to review and appraise representative pieces of consumer behavior research.

441 Housing, Consumer Credit, and Real Estate Finance
Spring. 3 credits. Prerequisites: CEH 110–111. S-U grades optional. Offered alternate years. T R 10:10–11:25. R. Heck. Examines the relationship between housing and consumer 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.

443 Social Aspects of Housing and Neighborhood
Fall. 3 credits. Prerequisite: CEH 247 or 148. S-U grades optional. T R 10:10–11:25. A. Shlay. The relationship between housing and social behavior and organization is examined. Levels of analysis include the physical features of housing that influence human behavior and the quality of life, the housing 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.

448 Housing and Local Government
Spring. 3 credits. Prerequisites: CEH 110 or equivalent. S-U grades optional. Offered alternate years. 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 expense burden—and socioeconomic and psychological aspects of elderly housing environment. Attention is also given to government housing programs for the elderly, integrating housing and related social service activities, and options for alternative housing.

449 Housing Policy and Housing Programs
Fall. 3 credits. Prerequisites: CEH 110 or equivalent. S-U grades optional. T R 2:30–3:45. M. Lea.
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. Special attention will be given to the differences and interactions between rental and owner-occupied housing. Other topics include public housing, cash-based housing programs, tax treatment of housing, the problems of the thrift industry, and the presidential role in the secondary-mortgage market.

450 Economics of Health, Health-Care Expenditures, and Health Policy Fall. 3 credits. Prerequisite: CEH 111. T R 2:30–3:45. S. White-Means. A study of the health-care market as distinguished from other markets because of the relative information disadvantage on the part of the consumer. Topics include a theoretical and institutional analysis of the health-care system and its role in the consumer decision-making process, conflicts of interest between institutions, the operations 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 assessability.

465 Consumers and the Law Fall. 3 credits. Prerequisite: CEH 111 or equivalent. S-U grades optional. M W F 1:25. W. K. Bryant and J. Gerber. The operations of federal agencies and the courts in various contexts, including compensation for injury from defective products, deceptive advertising, the Fairness Doctrine in television and radio broadcasting, the regulation of food and pharmaceutical drugs, class actions, fraud, and the proposed consumer protection agency.

472 Community Decision Making Fall. 3 credits. Prerequisite: Government 111 or equivalent. S-U grades optional. T R 6:30–9:55. A. Hahn. Identification and discussion of factors that influence the decision-making process in the public sector and introduces the student to the tools of cost benefit analysis as a device for evaluating the effectiveness of government programs. The first half of the course examines the rationales for government intervention and the mechanisms (both legislative and bureaucratic) by which the rationales are translated into government programs. The second half of the course concentrates on the evaluation of government programs through cost benefit analysis. Discussion of the issues and problems of cost benefit analysis is augmented with examples of its use in a variety of areas, including physical investment projects, housing programs, and government regulations.

600 Special Problems for Graduate Students Fall and spring. S-U grades optional. Hours to be assigned. T R 8:30–9:55. A. Davey. The purpose of this course is to provide an opportunity for graduate students to make an indepth study in an area of special interest. Recommended topics for study include the evaluation of government programs, the social and economic consequences of household variation among nations and between subgroups within the nation; changes over time, including both secular trends and change over life cycle; the determinants of change and variation; and the socioeconomic consequences of household variation. Further examination of theoretical and empirical literature concerning market work, household production, and family formation as well as policies in these areas. Based on introduction provided in CEH 626.

628 Information and Regulation Spring. 3 credits. Prerequisites: CEH 626 or 627. M W 8:30–9:55. P. Ch. A survey of the problems and policies accompanying informational failures and other market failures with regard to consumer well-being. Governmental regulation of products, of producers, of consumers, and of prices is examined. Anti-trust activity, disclosure requirements, advertising restrictions, and regulatory agencies are examined in terms of their ability to serve the public interest or to serve special interests; the courts, rather than institutional structure, is emphasized.

640 Fundamentals of Housing Fall. 3 credits. Prerequisite: graduate standing or permission of instructor. S-U grades optional. M W 2:30–3:45. P. Ch. 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 housing-building industry, the nature and impact of government housing programs, and the social and economic effects of housing regulations.

642 Housing and Local Government: A Microperspective Spring. 3 credits. Prerequisite: Economics 311 or equivalent. S-U grades optional. Offered alternate years. Not offered 1983–84; next offered 1984–85. T 2:30–5. P. Zorn. An examination of housing issues from a microeconomic perspective. The course first establishes a context for the study of housing by briefly exploring economic theories of the structure of urban environments. The housing market equilibrium of housing is then considered along with special topics on rent control, filtering, and discrimination. The local government perspective is introduced by considering the issues of zoning and land-use controls, suburbanization-sprawl, and property taxation.

644 Housing Finance and Market Analysis: A Macroperspective Spring. 3 credits. Prerequisites: Intermediate micro- and macroeconomics, one course in statistics. Recommended but not required: CEH 441. Offered alternate years. T 3:35–5. M. Lea. This course analyzes housing markets and housing policies from the macroeconomic and financial perspectives, focusing on both regional and national aspects of housing demand and supply. The first half of the course develops a macroeconomic framework for analyzing housing by discussing the role of housing in the economy, determinants of overall homeowner-ownership rates, aggregate housing demand and production, and housing forecasts. The second half of the course focuses on the housing finance system, including the effect of both credit availability and the structure of different mortgage instruments on housing demand, the problems and current attempts to reform the thrift industry, and the development and economic effects of the secondary-mortgage market.

648 Household and Family Demography Spring. 3 credits. Prerequisite: graduate standing or permission of instructor. S-U grades optional. Offered alternate years. M W 2:30–3:45. P. Ch. This course is concerned with the size and composition of households and families; the variation among nations and between subgroups within the nation; changes over time, including both secular trends and change over life cycle; the determinants of change and variation; and the socioeconomic consequences of household variation.
and change, such as influences on residential mobility and housing adjustments, impacts of family structure on fertility, implications of family composition for female labor-force participation, and effects of household and family structure on economic behavior.

[665 Seminar on Consumer Law Problems Spring. 3 credits. Open to CEH graduate students and to others with permission of instructor. Enrollment limited to 20 students. S-U grades optional. Not offered 1983–84. T 10:10–11:05. Staff. A study of areas of current interest to consumers involving the law as developed by regulatory commissions and the courts, with emphasis on the institution 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. 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 toward defining the parameters whereby community (spatially proximate people) or can become a viable arena for social change.

[671 Power, Participation, and Public Policy Spring. 3 credits. S-U grades optional. Offered alternate years. Not offered 1983–84; next offered 1984–85. 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 legitimacy. 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. M W F 9:05. S. Clemhout. 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, health, and institutional and economic background. Encourages critical examination of policy issues and their social and economic effects on families.]

[727 Human Capital Fall. 3 credits. Prerequisite: intermediate economic theory or permission of instructor. Recommended but not required: CEE 411: S-U grades optional. Offered alternate years. Not offered 1983–84; next offered 1984–85. Hours to be arranged. J. Gerner. This course examines the public sector policies that influence family time-allocation decisions. Particular attention will be given to the time allocated by female family members to nonhousehold 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 1983–84. Hours to be arranged. Focuses on a selected group of national issues related to housing. The issues evaluated vary from year to year, based on current importance and student interest. When possible, this course presents original research, with emphases on both content and methodology.]

[899 Master's Thesis and Research Fall or spring. Prerequisite: permission of the chairperson of graduate committee and instructor. S-U grades optional. Graduate faculty.]

[999 Doctoral Thesis and Research Fall or spring. Prerequisite: permission of the chairperson of graduate committee and instructor. S-U grades optional. Graduate faculty.]

Design and Environmental Analysis Courses


111 Theory of Design Spring. 3 credits. Enrollment limited to 120 students; DEA majors given priority. M W F 11:15. Staff. Introduction to the theories of design for the student in any academic year. The course reviews the spectrum of design activities, examining various movements in the visual arts and differences among designers in philosophical premises, social and functional roles, and cultural positions. Also examined are requirements in the man-made environment as affected by the interaction of people, design, and materials. Lectures and visual material are presented by DEA faculty members and visiting design professionals.

115 Drawing Fall or spring. 3 credits. Each section limited to 25 students. Priority given to DEA majors. Minimum cost of materials, $50. M W 1:25–4:25 or 7:30–10:30 p.m., or T R 1:25–4:25. Staff. A studio drawing course. Discussion groups on the idea and techniques of drawing are held to develop a visual understanding and vocabulary. The student is introduced to the fundamentals of line, shape, and value. Drawing from the figure and from inanimate objects, perspective, and conceptual drawing are emphasized.

117 Drawing the Clothed Figure Spring. 3 credits. Enrollment limited to 25 students. Prerequisites: DEA 115 or equivalent. Priority given to DEA Option 2 and 3 majors. S-U grades optional. Approximate cost of textbook: $25; supplies, $35. M W 8–11. C. Garner. Intended to improve the student's ability to illustrate two-dimensionally the interaction of draped fabric and the human form and to develop awareness of clothing as a design medium. Emphasis is on development of techniques and skills in selected media necessary for communication of design ideas.

120 Elements of House Design: Technology Spring. 3 credits. Lect, T R 10:10–11:30, lab, T or R 10:10–12. L. Manikowski. An introduction to the residential design process. A thorough analysis of the construction techniques and mechanical systems of human habitation. Topics include a historical overview of shelter and architectural styles of the 1900s, site selection and analysis, building materials, structural design, water and waste systems, electrical lighting systems, energy conservation techniques, and contemporary passive solar-energy systems. The course ends with a minor design problem intended to integrate technology and the design process.

135 Textiles I Fall. 3 credits. Each lab limited to 20 students. Prerequisite or corequisite: Chemistry 103 or 207. Maximum cost of supplies and textbook, $30. Lect, M W 10:10, lab, T or W 2:30–4:25. Staff. An introduction to the basic properties of textile materials, with consideration of their technology, consumer uses, and economic importance. Behavior of textile materials is observed in a variety of environmental conditions that influence their performance, comfort, and performance. This course is designed to provide a basis for further study in textiles, but it also contains sufficiently broad coverage of the subject to be used as an elective course.

145 Apparel Design I Fall or spring. 4 credits. Prerequisite: basic sewing skills. Those with formal course work in pattern design may take an exemption exam by contacting instructor the first day of registration. Minimum cost of materials, $60; lab fee, $5. Fall: lectures and labs, T R 1:25–4:25. Spring: lectures and labs, M W 7:30–10:30. S. S. Watkins, M. W. White, A. Racine. Intensive study of principles and processes of flat pattern design and fitting techniques with emphasis on development of creative expression.

150 Introduction to Human-Environment Relations Fall. 3 credits. Required for DEA majors. M W F 12:20–1:10. F. Becker, E. Ostrander, B. Sims, G. Sloan. An introduction to the influence of the physical environment on human behavior. Topics include environmental influences on social behaviors such as crowding, sense of community, crime, and friendship; environmental needs associated with social characteristics such as different stages in life cycle; lifestyle, social class, family structures, and handicaps; basic consideration in person-environment fit such as lighting, acoustics, and thermal comfort; an introduction to human factors and
systems analysis, the effects of environmental form on perception and cognition; the dynamics of collaboration, user-responsive design; the participatory design process; research in programming, and postoccupancy evaluation.

201 Design III: Basic Interior Design Fall 5 credits. Each section limited to 18 students. Prerequisites: DEA 201, 203. Prerequisite or corequisite: DEA 111, 150, and 204. Minimum cost of materials, $120; shop fee, $10; optional field trip, approximately $60. M 2:30-4:25 and T W R 1:25-4:25. A. Bushnell, P. Eshelman, N. Markovich.

Beginning interior design studio. Focus is on development of basic proficiency in design skills. The course is structured around a series of elementary interior and interior-product design problems of 3 to 5 weeks in length.


Second interior design studio. Emphasis of the course is on continued development of basic proficiency in design skills through exposure to a selective set of interior and interior-product design problems of limited complexity. Each problem of 3 to 5 weeks duration is structured to emphasize different aspects of the design process.

203 Design Communications Fall. 1 credit. Enrollment limited to 25 students. Priority given to DEA Option 1 majors. M 1:25. P. Eshelman.

Communicational techniques for interior designers. Focus is on a selected set of prepresentational techniques useful to designers in understanding and developing design proposals during the design process, and on communicating interior design proposals to clients and users. Plans, sections, perspectives, isometrics, rendering techniques, models and model photography, and techniques for presentations of design proposals to audiences will be covered.

204 Introduction to Building Technology Spring 1 credit. M 1:25. L. Mankowski.

Introduction to building technology for interior designers and facility managers. Emphasis is placed on developing basic understanding of buildings and building systems and their implications for interior design and facility management. Covers basic building types; structural systems; construction materials and methods; HVAC systems; plumbing, electrical, lighting, fire, and security systems; and telephone, computer, and other communication systems.

230 Science for Consumers Fall. 3 credits. Limited to 20 students. Prerequisite: high school or college chemistry or physics. S-U grades optional. M 10:10-12:05. F. Becker.

Principles of science related to consumer problems such as energy conservation in the home, electricity in dwellings, heat transfer, control of temperature, humidity, clothing and comfort; walls, ceilings, mechanics of equipment, chemistry of cleaning agents, and chemical characteristics of surfaces to be cleaned. Particularly valuable for environmental designers and analysts and product design planning to work with consumers as teachers, extension workers, home-service personnel, or consultants.


An examination of some underlying scientific principles of today's complex technology. Designed to enable students to identify, understand, and better evaluate those aspects that have a basis in the physical sciences and are of concern to society. Some areas to be covered: air and water quality; communications, energy, and toxic wastes-risks and regulations. Course relates principles of the natural sciences to specific applications that affect people and their environment.

235 Textiles II Spring. 4 credits. Each lab limited to 16 students. Prerequisites: DEA 135 and 1 semester of chemistry. Recommended: 2 semesters of chemistry. Lect. T R 9:05, labs, T R 10:10-12:05 or T R 2:30-4:25. P. Schwartz.

A study of critical performance characteristics of textiles and the relation of these characteristics to use of textile articles. Emphasis is on comfort, durability, and special performance characteristics. Also included is study of the purposes, scope, and limitations of laboratory textile testing and the relations between laboratory testing and end-use performance.

240 Clothing through the Life Cycle Spring 3 credits. Open to freshmen, sophomore, and DEA transfers, others with permission of the instructor. T R 10:00-11:55. D. Watkins.

An introduction to clothing as it affects the physical and psychological well-being of the individual. Emphasis is on the functional aspects of clothing for individuals from infancy through old age and for groups such as the handicapped or those in special occupations. Students explore the resources available to the designer for solving clothing problems.

242 Apparel Industry: Field Experience January intersession or spring-term break. 1 credit. Approximate cost, $250 to $300. B. Ziegert.

A one-week field experience in a major apparel center. Students are responsible for field-trip expenses. Students may take the opportunity to observe design firms, manufacturers, retailers, promotion and media establishments, and museums in the multifaceted apparel and textile industry.

245 Dress: A Reflection of American Women's Roles Fall. 3 credits. Enrollment limited to 40 students. S-U grades optional. Because the class meets only once a week, attendance at each session, especially the first, is extremely important. M 7:30-10:30 p.m. A. Racine.

A historical survey of changing patterns of American women's dress from the colonial period to present day, as well as the socioficial forces that affected women's development within the social class structure. The Cornell Costume Collection and illustrated lectures are used to develop an awareness of historic costume, while assigned readings focus on expected roles. Students investigate topics dealing with the impact of dress on cultural assimilation of immigrant women in America.

250 The Environment and Social Behavior Fall 3 credits. Prerequisite: DEA 150 or permission of instructor. M 10:10-12:05. F. Becker.

A combination seminar and lecture course for students interested in the social sciences or design. Using a series of exercises, students examine and apply the social-environmental form influences social behaviors such as aggression, cooperation, community, and crime, and how characteristics such as stage in life cycle, family structure, and social class influence individual roles and purposes. The 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. G. C. Millican.

A study of the patterns of historical development and change in architecture, furniture, and interiors from man's earliest expressions to the present as they reflect the changing cultural framework of Western civilization, excluding America.


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.


A studio course that emphasizes the fundamental principles of design applied to the planning of residential interiors and coordinated with family and individual needs. Studio problems explore choices of materials, space planning, 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 and 135, or permission of instructor. Recommended: DEA 115 and 240. Apparel design majors should take DEA 264 and 367 in the same academic year. Minimum cost of materials, $60; lab fee, $5. T R 1:25-4:25. B. Ziegert.

A studio course interrelating two techniques for design of apparel: shaping and advanced flat pattern. Problems require the student to make judgments regarding the design process, nature of the materials, body structure, and function.

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 syllabus description of the study they want to undertake, on forms 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.


Intermediate-level interior design studio. The course is organized around a series of interior and interior-product design problems of intermediate-level complexity. The course is on development of design skills and on understanding of a selected set of generic problem types.
Design VI: Intermediate Interior Design  

Second-semester, intermediate-level interior design studio. Continued emphasis on development of design skills and an exposure to generic problem types.

303 Introduction to Furnishings, Materials, and Finishes  
Fall. 1 credit. M 1:25. N. Markovich.

Basic understanding of furniture types and systems; interior products and equipment such as workstations; window, wall, and floor coverings; ceiling and lighting systems, and materials and finishes. Emphasis is placed on criteria for selection of furnishings, materials, and finishes for typical interior design and facility management problems.

304 Introduction to Professional Practice of Interior Design  
Spring. 1 credit. M 1:25. N. Markovich.

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, project scheduling, legal responsibilities and contracts, basic contract documents such as working drawings and specifications, supervision of construction and installation, and cost estimation.

325 Human Factors: Ergonomics-Anthropometrics  
Fall. 3 credits. Recommended: DEA 150. 


Implications of human physical and physiological characteristics and limitations on the design of settings, products, and tasks. An introduction to engineering anthropology, biomechanics, work physiology, and motor performance. Attention is given to the needs of special populations such as the physically handicapped.

330 Household Equipment Principles  
Fall. 3 credits. Prerequisites: Nutritional Sciences 146 or DEA 135 or 230. S-U grades optional. Offered alternate years. Not offered 1983–84; next offered 1984–85.


Principles of operation of appliances for food preparation, cleaning and washing, cleaning and laundry, heating, temperature and humidity control, and lighting. Use of energy by appliances. Evaluation of features in relation to their function and cost. Selection, use, and care of household equipment. Individual study related to the student’s background and interests.

335 Textiles III: Structure and Properties  
Spring. 4 credits. Prerequisites: DEA 235, Physics 101, 112, or 207, and Chemistry 214, 253 and 251, or 357–358 and 251.

Leck, M W F 9:30; 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.

338 Textiles for Interiors and Exteriors  
Spring. 3 credits. Prerequisite: DEA 135 or permission of instructor. S-U grades optional.

T R 2:30—4:25. V. White.

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 on which these textiles are used. Field trips are arranged when feasible.

343 Design: Introductory Textile Printing  
Fall. 3 credits. Each section limited to 15 students. Prerequisites: DEA 101 and at least one other studio design course. Minimum cost of materials, $50. Not offered 1983–84.


A studio design course covering the silk screen method of designing and printing fabric. All projects are printed on fabric using permanent fiber-reactive dyes. Projects cover the study of color, design of surface pattern, texture, and composition for fabrics.

348 Environmental Graphics and Signage  
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.


A studio course dealing with both the functional and decorative aspects of environmental graphics. Includes projects in interior and exterior graphics, signage, and directional systems.

349 Graphic Design  
Spring. 3 credits. Enrollment limited to 20 students. Prerequisite: DEA 201 or permission of instructor. Prior to given to DEA majors. Approximate cost of materials, $25.


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  
Spring. 3 credits. Recommended: DEA 150.


An introduction to human-factor considerations in lighting, acoustics, noise control, and the thermal environment. The ambient environment is viewed as a support system that should promote human efficiency, productivity, health, and safety. Attention is given to the needs of special populations such as the elderly. Emphasis is placed on the implications for planning, design, and management of settings and facilities.

351 Selected Topics In History of Costume  


A study of the relationship between costume and culture in selected periods of history from ancient times to the present. History is used as a resource for solving contemporary apparel needs. Lectures and class discussion are illustrated with items from the Cornell Costume Collection.

353 Historic Design III: Contemporary Design  
Spring. 3 credits. Prerequisite: DEA 101. Corequisite: DEA 111. Recommended sequence: DEA 261, 252, and 353.


A historical study of the emergence and development of contemporary design. 1985 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.

T R 8—11. G. C. Millican.

An introduction to architectural residential 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. Prerequisites: DEA 115, 240, and 264 or permission of instructor. Corequisites: DEA 235 and 117. Apparel design majors should take DEA 264 and 367 in the same academic year. Minimum cost of materials, $60; lab fee, $5.


Advanced apparel students prepared 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 inspiration.

400–401–402 Special Studies for Undergraduates  
Fall or spring. Credits to be arranged. S-U grades optional.

For study that predominantly involves literature 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 the 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.

430 The Textile and Apparel Industries  
Fall. 3 credits. Prerequisites: Consumer Economics and Housing 233, DEA 235, or permission of instructor. M 12:20—2:15.

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, the environment, safety, international trade, and employee benefits and opportunities. The role of trade unions also is explored. A one-day field trip is arranged when feasible.

431 The Textile and Apparel Industries—Field Experiences  
Second week of January intersession 1 credit. Prerequisite or corequisite: DEA 430. S-U grades only. Offered alternate years. Students are responsible for trip expenses, approximately $175. 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.
434 Care of Textiles Fall. 2 credits. Prerequisite: DEA 235. Not open to students who have taken DEA 230. Not offered 1983–84.
The interaction of textiles with soils and stains, cleaning agents, and laundry equipment. Topics include characteristics of soils, mechanisms for bonding soils to substrates, textile properties and changes related to care processes, functional finishes, wet- and dry-cleaning processes, the supplies and techniques used in cleaning, and instructions for care.

436 Textiles IV: Textile Chemistry Fall. 4 credits Prerequisites: DEA 235, Chemistry 253 and 251 or Chemistry 357–358 and 251.
An introduction to the chemistry of the major classes of natural and man-made fibers, including their structure, properties, and reactions. Laboratories include the qualitative identification of textile fibers and consideration of chemical damage to fabrics, finishes, and dyes.

437 Fabric Technology Fall. 3 credits. Each lab limited to 15 students. Prerequisite: DEA 235. Offered alternate years. Approximate cost of text and supplies: $50.
Lecs. C. T 10:10, lab. T or F 2:30–4:25. 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 possible 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. Laboratory exercises include the analyzing of different fabric samples to determine structure and method of manufacture. Other laboratory exercises students select a fabric application and determine the appropriate fabric construction specifications to satisfy the requirements of the application.

438 Apparel Textiles Fall. 3 credits. S-U grades optional. Prerequisites: DEA 235 and 264, or permission of instructor.
M W 2:30–4:25. P. Field, trips will be arranged when feasible. V. White. A study of the interrelationships 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 communications at consumer, government, industry interfaces. Individual or team projects. Seminars and lectures with required readings. Labs include evaluation of apparel.

439 Textile Materials for Biomedical Use Fall. 2 credits. S-U grades optional for non-DEA majors. Prerequisites: DEA 135, 235, or permission of instructor.
Focuses on chemical and physical properties of textiles and the performance of textile materials (including structural, 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.
M W 10:10–11:30. S. Watkins. Students learn to apply fundamental design theory to clothing which is a source of activity 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 Spring. 3 credits. Prerequisite: DEA 150 or permission of instructor. Recommended: a statistics course.
M W F 10:10. E. Ostrander. The course develops the student's understanding and competence in the use of research and analytical tools to study the relationship between the physical environment and human behavior. Emphasis is placed on selection of appropriate methods for specific problems and the policy implications derived from research. Topics include unobtrusive and obtrusive data-collection processes of qualitative and quantitative data, and effective communication of empirical research findings.

459 Programming Methods in Design Spring. 3 credits
An introduction to environmental programming, with an emphasis on the formulation of system requirements that follow from user characteristics and limitations. Diverse methods for determining the characteristics required of a particular environmental setting (in order that it support the desired behaviors of its users and operators) include systems analysis, behavior-circuits approach, behavior-settings approach, and user-characteristics approach. The student's ability to select appropriate methods to suit problems or, when needed, to devise new methods or techniques is accentuated.

465 Apparel Design V Spring. 3 credits. Prerequisites: DEA 117 and 367 or permission of instructor. Recommended: DEA 102 and 445. Minimum cost, $60, lab fee, $5.
M W 1:25–4:25. B. Ziegler. Through studio problems in fashion design, students examine the influence of manufacturing technology, and cost on the apparel designer. Lines 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 in DEA 499, to be taken concurrently or in a subsequent semester. Students are strongly encouraged to satisfy the basic 4 hour requirement in 499 requirements (to continue with an additional 4-hour studio in the spring semester.) Prerequisites: DEAs 301, 302, 303, and 304. DEAs 302 and 499 may not be taken concurrently. Minimum cost of materials, $120.
T 1:25–4:25. Staff.
Advanced interior design studio. A comprehensive design-problem-solving experience involving exploration of problem situations and design problem definition from inception through implementation. Focus is on attainment of advanced proficiency in the application of substantive and procedural material from previous courses to a complex and realistic interior design problem selected by the student and approved by the instructor. The course is structured around five phases of activity of three or four weeks in duration. Emphasis will be placed on conceptualization and programmatic requirements. Emphasis is placed on generation of alternative designs, evaluation of alternatives, development and refinement of selected alternatives, design of implementation measures, and the presentation and communication of the final design and rationales and procedures utilized.

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 chairman and approved by the head of the department and instructor.

639 Mechanics of Fibrous Structures Fall. 3 credits. Prerequisites: DEA 235 or equivalent or permission of instructor. Recommended: DEA 335. Offered alternate years. Not offered 1983–84; next offered 1984–85.
Hours to be arranged. 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 tension, shear, and compression stress; fabric bending and buckling; and the mechanical behavior of nonwoven textile materials. [Apparent text error: 'Mechanics of Fibrous Structures' is repeated with a different course number and credit value, which is not possible in the given context.]

308 Human Ecology Fall. 3 credits. Prerequisite: DEA 235 or 367 or 436 or permission of instructor. Fall, 3 credits. Undergraduates and graduate students only. Open to advanced undergraduates who have permission of instructor.
T 4:30–5:45. Staff.
New developments, research findings, and other topics of major concern to the field of textiles are discussed by faculty members, students, and guests. 

637 Seminar: Frontiers in Textiles Fall and spring. 1 credit a 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.
Seminars and workshops, readings, and field trips are arranged to bring faculty and students up to date on recent developments in the field of textiles.

639 Mechanics of Fibrous Structures Fall. 3 credits. Prerequisites: DEA 235 or equivalent or permission of instructor. Recommended: DEA 335. Offered alternate years. Not offered 1983–84; next offered 1984–85.
Hours to be arranged. 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 tension, shear, and compression stress; fabric bending and buckling; and the mechanical behavior of nonwoven textile materials.

808 Shelter Fall. 3 credits. Undergraduates and non-DEA graduate students must have permission of the instructor. S-U grades optional. A combination seminar and lecture course. Historical aspects of housing since World War I: structures and materials, energy constraints, construction and manufacture, cost, physical and psychological human needs, and survey of housing patterns. [Apparent text error: '808 Shelter' is repeated with a different course number and credit value, which is not possible in the given context.]

821 Textile-Fiber Evaluation Spring. 3 credits. Prerequisites: DEA 335 or 436 or permission of instructor. S-U grades optional.
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.

430 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.
Applied physical science for professionals working with consumers and home appliances.

635 Special Topics In Textiles Spring. 3 credits. Prerequisite: DEA 235 and 335, or permission of instructor.
Fall 3 credits. Each lab fall and spring. 1 credit a 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.
Seminars and workshops, readings, and field trips are arranged to bring faculty and students up to date on recent developments in the field of textiles.
640 Adaptive Building Reuse  Spring  5 credits. Limited to 15 students. Approximate cost of materials, $100.
T R 1:25-2:45  L. Manolowski. This design course incorporates adapting and reusing existing urban structures. Includes the analysis of existing conditions; market feasibility; 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 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. S-U grades optional. Limited to graduate students. Open to advanced undergraduates who have permission of instructor.
Hours to be arranged. V. White.
This course is designed to provide an awareness of the dynamic process of developing standards. What are standards? Who makes them? How do they affect the individual, the nation, business, industry, and government? Consumer product standards as a category will be considered, and both voluntary (such as ISO, ANSI, ASTM) and governmental regulatory procedures in the development of standards are reviewed. The development and use of standards are studied using case histories (for example, solar heating, apparel sizing, textile labeling, meat codes and ordinances that impact on the design process. Consideration is given to interactions among government, industry, and consumer groups, and to the interfaces between voluntary and mandatory standards and between national and international standardization systems.

T R 10:10-11:30, plus hour to be arranged.
G. Sloan.
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 of Office Design  Spring  3 credits. Prerequisite: DEA 250 or permission of instructor.
M W 2:30-4  F. Becker.
Intended for students interested in the management and administration of organizations as well as those interested in their design. Examination of the ways in which office design influences behaviors such as conflict, cooperation, group cohesiveness, feedback, job satisfaction, and effectiveness. The social and organizational impact of new furniture and electronic equipment systems, as well as work done in alternative settings such as the home, is also discussed. Consideration is given to social forces underlying the development of office environments, including office standards and planning processes. Emphasis is on planning for the design, development, and management of office environments.

655 Dynamics of Collaboration in the Design Process  Fall  3 credits. Prerequisites: a course in elementary psychology and DEA 250, 350, and 455.
M W 11:15-12:30  E. Ostrander.
The role of clients, designers, users, and special consultants in working collaboratively to develop physical and social systems for living, working, and recreation. The structuring of group process to maximize effective collaboration. The procedures for collating and integrating behavioral data into formats that nonresearchers can understand as a basis for decision making. Familiarity with interaction process models that can be applied to the special problems of interdisciplinary work with the design and management professions.

656 Research Methods in Human-Environment Relations  Spring  4 credits. Letter grades only. Prerequisites: DEA 150 or permission of instructor. Recommended: a statistics course.
M W F 10-12, plus hour to be arranged. E. Ostrander.
The course develops the graduate student's understanding and competence in the use of research and analytical tools to study the relationship between the physical environment and human behavior. Students attend DEA 455 lectures but have more extensive readings and projects and meet an additional hour each week.

659 Seminar on Facility Planning and Management  Fall. 1 credit. S-U grades only. Expected every semester.
Hours to be arranged.
Staff Seminar on current issues and content in the field of facility planning and management. Discussion by faculty, students, and invited guests.

660 The Environment and Social Behavior  Fall. 4 credits. Prerequisite: DEA 150 or permission of instructor.
M W 10-12, 05, plus hour to be arranged. F. Becker.
A common 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.
Hours to be arranged. Graduate department.

Human Development and Family Studies Courses


Human Development: Infancy and Childhood  Fall or summer. 3 credits. S-U grades optional.
HDFS 116. S-U grades optional. Offered alternate years. E. Ostrander.
An overview of methods of observing people and the settings in which they behave. Children's ability 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.

115 Human Development: Infancy and Childhood  Fall or summer. 3 credits. S-U grades optional.
M W F 11:15-12:15, S. Ceci.
A broad introduction to 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 the individual and shaping the individual.

116 Human Development: Adolescence and Youth  Spring  4 credits. Summer 3 credits. S-U grades optional.
Lecs, T R 12 20-2:15  R. Savin-Williams, M. Bascheches.
Provides a broad overview of theories, issues, and research in the study of human development from early adolescence to early adulthood (youth). Attention is focused on the interplay of biological and cognitive factors, interpersonal relationships, social structure, and cultural values in shaping the individual's development. The role of adolescence in both the individual's life course and the evolution of the culture as a whole is considered. Familial, peer group, educational, and work contexts for development are discussed.

117 Human Development: Adult Development and Aging  Spring  3 credits. S-U grades optional.
M W F 2:30  S. Cornelius.
Provides a general introduction to theories and research in adult development and aging. Psychological, social, and biological changes from youth through late adulthood are discussed. Both individual development and differences among generations are emphasized.

[141 Introduction to Expressive Materials  Spring  3 credits. Limited to 18 freshmen and sophomores. Not offered 1983-84.
T R 2:30-4:25  W. L. Brittain.
Designed to explore the means and materials suitable for creative expression for children of different ages as well as for adults. Students are expected to acquire competence in evaluating and utilizing various media and understanding the creative process. Experimentation in paint, clay, chalk, crayon, paper, wire, plaster, wood, and other materials.

150 The Family in Modern Society  Fall or summer. 3 credits. S-U grades optional.
M W F 1:25  P. Moen.
Contemporary family roles and functions are considered as they appear in United States history, as they change over the life cycle, and as they are influenced by social changes. The effects of social forces that impinge on them. See also Sociology 201.


Human ecology students must register for HDFS 201.
M W F 11:15-12:15  R. L. Brieger and staff.
With its emphasis on the evaluation of case studies and research reports, this course covers 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.

[212 Early Adolescence  Fall  3 credits.
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, the relationship of the individual to society, and individual psychological development in general are explored. The course places heavy emphasis on writing skills (several five-page papers) and critical thinking (critiques of published research).

218 From Adolescence to Adulthood: Developmental Issues  Fall 3 credits. Prerequisite: HDFS 116. S-U grades optional. Offered alternate years.
T R 2:30-3:45  M. Bascheches.
Special arrangement for course work to establish equivalency for courses not transferred from a previous major or institution. Students prepare a multiplicity description of the study they want to undertake, on forms 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.

[302] Family and Community Health Fall or spring. 3 credits. S-U grades optional. Not offered 1983–84.
T R 1:25, sec 1, T 2:30, sec 2, R 2:30. Staff. This introduction to health science focuses on research and knowledge related to personal, family, and community health; physical, emotional living, disease prevention, and the environmental problems that affect the quality of health throughout the life cycle. Substantive material includes physical, mental, and emotional functioning; chemical alteration of behavior; family health; personal health care; and health in society. Discussion sections deal with decision making and application of theory in health science.

[307] Collective Behavior and Social Movements (also Sociology 307) Fall. 4 credits. Prerequisite: a course in sociology or another social science. Human ecology students must register for Sociology 307. Not offered 1983–84.
T R 2:30–4. G. Elder. An inquiry into social behavior that breaks with institutionalized or conventional forms, such as acting crowds, mobs, social movements, and revolution. Analysis of antecedent conditions, emergent forms, processes, and consequences. Historical and contemporary studies are covered.

[313] Problematic Behavior in Adolescence Spring. 3 credits. Prerequisites: HDFS 116 and one other course on adolescence. Students interested in adding related field experience should register concurrently for HDFS 410 or 411. Offered alternate years. Not offered 1983–84.
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.

315 (See Human Service Studies 315, Human Sexuality)

333 Cognitive Processes in Development Fall. 3 credits. Prerequisites: HDFS 115 or equivalent. M W F 11:15. 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. Not to be taken concurrently with HDFS 141.
M W F 10:10. W. L. Brittain. A study of the processes 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. Prerequisites: HDFS 115. Not offered 1983–84.
T R 12:20–1:35. S. West. Examines various philosophical bases and specific implementation of a wide 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 also are studied.

[344] Infant Behavior and Development Spring. 3 credits. Prerequisite: HDFS 115 or equivalent. Not offered 1983–84.
T R 12:20–1:35. H. Ricciuti. Nature and determinants of major developmental changes in infant behavior from birth to two years. Special attention is directed to the role of major environmental influences on perceptual and cognitive development, and social and emotional development, and to recent attempts to modify infants’ experiences in the interest of facilitating psychological development.

346 The Role and Meaning of Play Spring. 2 credits. Limited to 30 students. Prerequisites: HDFS 115, HDFS 111 preferred.
Fall-F 1:30 p.m. G. Ricciuti.
The aim of this course is to examine the play of children aged three through seven. Through seminar discussions, workshops, films, and individualized research, the student will explore the meanings and validity of play in the lives of young children, the different ways that children play and the value of each, and the effect of the environment in enhancing and supporting play.

347 Human Growth and Development: Biological and Social Psychological Considerations (also Nutritional Sciences 347) Spring. 3 credits.
Prerequisites: Biological Sciences 101 or 109 or equivalent, and HDFS 115 or Psychology 101. M W F 1:25. J. Haas, H. Ricciuti. A review of major patterns of physical growth from the fetal period through adolescence, with consideration given to biological and sociocultural determinants of growth, as well as to physical and psychological consequences of variations in growth patterns. Normal patterns of growth are examined, followed by an analysis of major sources of variations in growth (normal and atypical).

348 Advanced Participation in Preschool Settings Fall and 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 conference each week. Staff. The 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 The Family in Cross-cultural Perspective Spring. 3 credits. Prerequisites: HDFS 115 or 116, Psychology 101 or Education 110, and HDFS 150 or Rural Sociology 100, or equivalent. S-U grades optional.
M W F 10:10. E. Kain. The sociological study of families from a comparative perspective, looking at similarities and differences across cultures and across ethnic groups. A major focus is on the interdependence of the family system and social institutions.

358 Theories of Adult Interpersonal Relationships Fall. 3 credits. S-U grades optional. R 2–4:25. H. Feldman. Selective theories of the basic disciplines in social psychology, sociology, and psychology are reviewed and their pertinence to understanding of adulthood examined. Students generate hypotheses about these theories and test one of them in 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. S-U grades optional. Prerequisites.
360 Personality Development in Childhood
Spring, 3 credits. Prerequisites: HDFS 115 or Psychology 101, plus one other course in HDFS or psychology.
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 child are examined. Problems 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. Not offered 1983–84.
M.W.F. 11:15. Staff.
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 social development of the individual based on a published biography or autobiography.

365 The Study of Lives
The study of personality development through the analysis of individual behavior, biographical, 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. 12:20. 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 and a course about personality. Not offered 1983–84.
Major forms of organic and familial retardation, perceptual and behavioral handicaps, and learning disabilities are considered with reference to problems of development, prevention, and remediation.

380 Aging and Health
Fall, 3 credits. Prerequisite: HDFS 117.
General introduction to health problems of the elderly and arrangements for dealing with them. The course discusses normal aging, 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.

397 Experimental Child Psychology
Fall, 4 credits. Prerequisite: HDFS 117. Enrolled primarily for students interested in entering graduate programs involving further research training. Offered alternate years. Staff.
T.R. 10:10–11:40; lab, hours to be arranged. L. C. Lee.
A study of experimental methodology in research with children. Includes lectures, discussions, and practical experiences covering general experimental design, statistics, and styles and strategies of working with children.

398 Junior Honors Seminar
Spring: 1–3 credits. Permission of the director of the honors program required for registration. Enrollment limited to students in the honors program. Hours to be arranged. J. Harding.
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.
Fall. 3 credits. Prerequisite: HDFS 270 or an equivalent experience. Offered alternate years. Not offered 1983–84.

404–405–406–407 Special Studies for Graduates
Fall or spring. Credits to be arranged. S-U grades optional. Offered alternate years. Not offered 1983–84.

408 Field Experience in Adolescent Development: The Individual in Community Settings
Fall. 3 credits. Prerequisites: HDFS 116 and 212 or 218, or permission of instructor. S-U grades optional. Offered alternate years. Not offered 1983–84.
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 adolescence 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.

409 Work and Human Development
Fall. 3 credits. S-U grades optional. Prerequisites: background in adolescent and adult development or work-related courses, and permission of instructor. Offered alternate years. Not offered 1983–84. M.W.F. 12:20. J. Brumberg.

410 Field Experience in Adolescent Development: Social Policy toward Youth

411 Field Experience in Adolescent Development: Social Policy toward Youth
Spring. Special Studies for Undergraduates.
Credits to be arranged. S-U grades optional. Offered alternate years. Not offered 1983–84.

412 Supervised Fieldwork
For study that predominantly involves library research or equivalent experience, and permission of instructor. S-U grades optional.

413 Learning in Children
Fall. 4 credits. Prerequisite: HDFS 115 or equivalent experience. M.W.F. 12:20–1:15; field experience to be individually arranged. M. Potts.
Consideration of the theoretical and research literature in processes of learning. Includes the interrelationships of learning and development, and
This introduction to Piaget's theory of intellectual development defines basic cognitive processes that underlie education (for example, linguistic processes that underlie language comprehension and production, numerical processes that underlie mathematics, reasoning processes that underlie logical inference, classification, and serialization) and reviews basic concepts 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 to various approaches to education (for example, the relevance of Piagetian developmental theory to standard and alternative education models.)

434 Piaget's Theory of Cognitive Development
Spring. 4 credits. Open to undergraduate and graduate students. Prerequisite: HDFS 115 or equivalent. S-U grades optional. Offered alternate years.

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 intelligence. The course reviews Genovese research on object permanence, the development of logical number, classification, and serialization, and formal operations of 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 research in these areas also is considered briefly.

436 Language Development (also Psychology 438)
Spring. 4 credits. Prerequisite: at least one course in developmental psychology, cognitive psychology, cognitive development, or linguistics. Recommended: a course in linguistics. Offered alternate years; not offered 1983–84.

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 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 Child Growth
Fall. 4 credits. Limited to 25 students. May be added during first week only.


Aimed at an appreciation and understanding of the creative process in music, dance, and drama in relation to the development of children.

438 Thinking and Reasoning
Spring. 3 credits.

A survey of problems in conceptual thought and 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 types of models, 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 8:00–11:50. 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.

441 The Development of the Black Child
Fall. 4 credits. Limited to juniors, seniors, graduate students, and students who have permission of the instructor. Prerequisite: HDFS 115 or equivalent. S-U grades optional. Not offered 1983–84.

T R 12:20–2:15. Staff.

This course provides comprehensive understanding of the development of black children independent of the comparative deficit models, a critical evaluation of theories and methods that have been used in the past, and an introduction to proactive ways of conceptualizing the development of black children in the United States, the Caribbean, and Africa within a cultural context. Topics include physiological, psychomotor, and cognitive development, intelligence, language, personal and extended identity, and alternative models for socialization.

456 Families and Social Policy
Spring. 3 credits. Prerequisite: one course in the area of the family or in sociology. S-U grades optional.

An examination of the intended and unintended family consequences of governmental policies, using case studies in areas such as social welfare, family care, and employment. The policy implications of changes in the structure and composition of families are also considered.

483 Development in Context
Spring. 3 credits.

Fall or spring. 3–4 credits. Prerequisite: one course in social sciences, or one in human biology and one in social sciences.


The course presents a systematic examination of existing research on human development throughout the life 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 Thesis
Fall or spring. Credit to arrange. 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 the instructor required.

Hours to be arranged. Department faculty.

This series of courses provides an opportunity for advanced undergraduates to explore an issue, theme, or body of research in the areas of departmental concentration. Topics vary each term the course is offered. Descriptions are available at the time of course registration. Although the courses are usually taught as seminars, a subject may occasionally lend itself to lecture, practicum, or other format.

415 Topics in Adolescent Development

435 Topics in Cognitive Development

445 Topics in Early Childhood Education and Development

455 Topics in Family Studies

465 Topics in Social and Personality Development

475 Topics in Atypical Development

485 Topics in the Ecology of Human Development

The Graduate Program

Fall. 3 credits. Time to be announced. M. Bassicesh.

Critical examination of some seminal theoretical writings on adolescent development, along with recent work relevant to intellectual development, ego development, and social development during late adolescence. Three approaches to human development that have stressed the importance of adolescence—psychoanalysis, structural developmental theory, and critical social theory—are interrelated. Empirical research on specific questions chosen by students is considered in the light of these approaches.

631 Cognitive Development
Spring. 3 credits

T R 2:30–4. B. Koslowski.

Overview of current research and theoretical issues in cognitive development, with special emphasis on the sorts of areas relevant to real-world (as opposed to laboratory) behavior and on the sorts of cognitive phenomena that can be detected by human observers (rather than phenomena that can be detected only with the aid of technical equipment).

640 Infant Care
Fall. 3 credits.


Critical review of major issues of contemporary concern in the field of infant behavior and development, based on readings of selected research papers and review articles. The overall intent is to develop an analytic understanding of where the field stands at present with respect to various topical issues and to identify directions for future research.

641 Early-Childhood Education
Fall. 3 credits.


Survey of major issues in the theoretical and research literature of early-childhood education.

650 Contemporary Family Theory and Research
Fall. 3 credits.

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>660</td>
<td>Personal and Socialization</td>
<td>Fall, 3 credits. W 2–4:25. Staff. Major issues in personality development and socialization, with special emphasis on theoretical models and empirical issues.</td>
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<tr>
<td>670</td>
<td>Atypical Development</td>
<td>Spring, 3 credits. Prerequisite: undergraduate course in abnormal psychology or psychopathology. Overview of current theories and empirical research on functional and organically based psychological disorders. Topic areas to be covered include autism, schizophrenia, neuroses, and personality disorders. Focus is on developmental aspects of abnormal behavior.</td>
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<tr>
<td>686</td>
<td>The Course of Life: Developmental and Historical Perspectives (also Sociology 658)</td>
<td>Spring, 3 credits. S-U grades optional. Enrollment limited to 15. Prerequisite: permission of instructor. Human ecology students must register for HDFS 686. Time to be announced. G. Elder. An introduction to the life course as a theoretical orientation, methodology, and field of study. Special emphasis is devoted to multidisciplinary convergence on life-course problems, to theory and research on the interaction of social, psychological, and biological processes from birth to death, and to historical influences.</td>
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<tr>
<td>691</td>
<td>Research Practicum in the Ecology of Human Development</td>
<td>Spring, 3–4 credits. Open to graduate students and upperclassmen by permission of the instructor. Hours to be arranged. U. Bronfenbrenner, M. Cochran, W. Cross. Students have the opportunity to participate in various phases of an ongoing five-nation study on the impact of family support systems on family function and the development of the child.</td>
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<tr>
<td>685</td>
<td>Seminar in Personality and Social Development</td>
<td>Focuses on selected issues related to personality and social development. The topics selected vary each year according to current importance in the field and student interests.</td>
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<tr>
<td>675</td>
<td>Seminar in Atypical Development</td>
<td>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.</td>
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<tr>
<td>685</td>
<td>Seminar in Human Development and Family Studies</td>
<td>Topics include development of self-concept, sex-role identity, observational methods, and interviews in developmental research.</td>
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<tr>
<td>690</td>
<td>Seminar on Ecology of Human Development</td>
<td>Topics include the institutional setting as a determinant of behavior, the poor family, and the identification and measurement of ecological variables.</td>
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<tr>
<td>700–706</td>
<td>Special Studies for Graduate Students</td>
<td>Fall or spring. Prerequisite: permission of instructor. Department faculty. For study that predominantly involves library research and independent study.</td>
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<tr>
<td>701</td>
<td>Empirical Research</td>
<td>For study that predominantly involves collection and analysis of research data.</td>
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<tr>
<td>702</td>
<td>Practicum</td>
<td>For study that predominantly involves field experience in community settings.</td>
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<tr>
<td>703</td>
<td>Teaching Assistantship</td>
<td>For students assisting faculty with instruction. Does not apply to work for which students receive financial compensation.</td>
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<tr>
<td>704</td>
<td>Research Assistantship</td>
<td>For students assisting faculty with research. Does not apply to work for which students receive financial compensation.</td>
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<tr>
<td>705</td>
<td>Extension Assistantship</td>
<td>For students assisting faculty with extension activities. Does not apply to work for which students receive financial compensation.</td>
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<tr>
<td>706</td>
<td>Supervised Teaching</td>
<td>For advanced students who assume major responsibility for teaching a course. Supervision by a faculty member is required.</td>
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<tr>
<td>899</td>
<td>Master's Thesis and Research</td>
<td>Fall or spring. Credit to be arranged. S-U grades only. Prerequisite: permission of thesis adviser. Department graduate faculty.</td>
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<tr>
<td>999</td>
<td>Doctoral Thesis and Research</td>
<td>Fall or spring. Credit to be arranged. S-U grades only. Prerequisite: permission of thesis adviser. Department graduate faculty.</td>
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<tr>
<td>706</td>
<td>Supervised Teaching</td>
<td>For advanced students who assume major responsibility for teaching a course. Supervision by a faculty member is required.</td>
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<tr>
<td>999</td>
<td>Doctoral Thesis and Research</td>
<td>Fall or spring. Credit to be arranged. S-U grades only. Prerequisite: permission of thesis adviser. Department graduate faculty.</td>
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<tr>
<td>700–706</td>
<td>Special Studies for Graduate Students</td>
<td>Fall or spring. Prerequisite: permission of thesis adviser. Department graduate faculty.</td>
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<tr>
<td>999</td>
<td>Doctoral Thesis and Research</td>
<td>Fall or spring. Credit to be arranged. S-U grades only. Prerequisite: permission of thesis adviser. Department graduate faculty.</td>
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<tr>
<td>202</td>
<td>Structure of Community Services</td>
<td>Fall and spring. 3 credits. T 1:25–2:15. R 12:20–2:15. I. Lazar, D. Ritchie. A lecture and discussion course designed as an introduction to the community base of services. Presence or absence of educational, social, and planning services, as well as their place and performance, are examined in the context of theoretical and empirical community dimensions. Examples of such dimensions include community complexity, differentiation, modernity, ethnicity, and community role.</td>
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<tr>
<td>203</td>
<td>Groups and Organizations</td>
<td>Fall and spring. 3 credits. M W F 10:10. Staff. 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).</td>
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<tr>
<td>246</td>
<td>Ecological Determinants of Behavior</td>
<td>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 2:30–3:45. D. Ritchie. Compares conceptual models of human behavior, encouraging the student to incorporate an ecological model into her or his 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 biopsychosocial functioning of the person-in-situation and valuing human diversity.</td>
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<tr>
<td>292</td>
<td>Research Design and Analysis</td>
<td>Fall or spring. 3 credits. Limited to 50 students. Prerequisite: basic course in psychology or sociology. T R 2:30–3:45. W. Trochim and staff. Students should develop skill in analyzing and evaluating research reports. Readings and periodic assignments and exercises focus on stating hypotheses, designing studies to test hypotheses, measuring variables, and interpreting findings. The major project is a research paper that is critiqued before the final draft is submitted.</td>
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<tr>
<td>300</td>
<td>Special Studies for Undergraduates</td>
<td>Fall or spring. 3 credits. Limited to 50 students. Prerequisite: basic course in psychology or sociology. Special arrangement for course work to establish equivalency for training in a previous major or institution. Students prepare a multipage description of the study they want to undertake, on forms available from the Counseling Office. This form, signed by both the instructor directing the study and the head of the department, should be filed at course registration or during the change-of-registration period.</td>
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Human Service Studies Courses

315 Human Sexuality Fall, spring, or summer 3 credits. Limited to 100 students. Prerequisites: an introductory course in human development and family studies, psychology, or sociology (or equivalent social science course). Plus one course in biology. S-U grades optional.
T R 1:25, sec. to be arranged. Evening prelims: Fall, Spring, to be announced. A. Parrot Eggleston.

The aim of this course is to provide students with an understanding of the interactions and interrelationships that are related to human sexual development and behavior. Three central themes are addressed: the development of sexual orientation over the life cycle, the evolution of sexual norms and customs within changing sociopolitical systems, and the biological components of human sexual development. An underlying issue is the influence of our social and cultural system 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, biology, history, communication arts, education, research theory, law, sociology, and psychology. There will be an evening midterm given in Bailey Hall.

325 Health-Care Services and the Consumer Spring. 3 credits. Open to students with a minimum of 12 semester hours of credits. A. Parrot Eggleston. 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.

330 Ecology and Epidemiology of Health Fall 3 credits. S-U grades optional
T R 10:10-11:25. A. Parrot Eggleston. Developments in the health field that affect the availability and kinds of health services. Emphasis is placed on interrelationships between institutions and agencies and the places each can play in prevention, diagnosis, and treatment of disease and disability. Focus will include historical and current trends, quality health care, consumer issues, and the problems of health care.

339 Ecological Approach to Instructional Strategies Fall. 3 credits. Limited to 20 students. Priority given to HSS majors. Prerequisite or corequisite: a course in educational psychology. T R 12:20-1:25. A. McLennan. This laboratory course provides theoretical frameworks for learning 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 environment are considered. Students select age groups 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.

370 Social Welfare as a Social Institution Fall 3 credits. Prerequisite: HSS 202 or permission of instructor. M W F 9:05. J. Allen. A philosophical and historical introduction to social welfare services. The course focuses on the social contexts from which programs and the profession of social work have evolved. It discusses the political and ideological processes through which public policy is formed and how policies are translated into social programs. 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. Limited to HSS, interdisciplinary, or independent majors. 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 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 at the University. Students prepare a multipage description of the study they want to undertake, on forms available from the Counseling Office. This form must be signed by the instructor directing the study and the department chairman and filed at course registration or within the change-of-registration period after registration. To ensure review before the close of the course registration or change-of-registration period, early submission of the special studies form to the chairman is necessary. Students, in consultation with their supervisor, should register for one of the following subdivisions of independent study.

400 Directed Readings For study that predominantly involves library research and independent 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 completed the course (or equivalent) in which they will be assisting and demonstrated a high level of performance. For study that includes assisting faculty with instruction.

411 Introduction to Adult Education Fall 3 credits. Limited to 45 students. Preference given to HSS majors. S-U grades optional
T R 10:10-11:25. H. Burris. Focuses on the broad aspects of adult education, scope and history of adult-education programs, philosophy and principles, perspective of the adult learner, media methods of instruction, and program development. Opportunities are provided for observation of adult-education programs in community organizations and agencies.

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 or C, I majors. Prerequisite: permission of the option advisor 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 conducted in the summer session, depending on the nature and location of the student's fieldwork.

[416] The Helping Relationship Fall. 3 credits Each section is limited to 20 students S-U grades optional. Not offered 1983–84.
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 and HSS 416 or 370 or equivalent course.
The framework of the course will take an analytical world view with some understanding of a capitalist political economy and the historically colonial relationship between the American ruling class and peoples of color, the poor, and the powerless. In addition, the course will analyze the effects of these structural and historical facts on people's lives today.

421 Aging and the Human Services Spring. 3 credits. Limited to seniors. Prerequisites: HSS 339 and 439. To be taken concurrently with HSS 442 and 443. May involve some expense for field visits.
T R 10:10–12:05, plus additional hours arranged during the week of independent study following student teaching. Staff.

441 The Art of Teaching Fall, weeks 1–7, 2 credits. Permission: HSS 339 and 439. To be taken concurrently with HSS 442 and 443. May involve some expense for field visits. An orientation for the student-teaching practicum. Major topics interrelated are classroom atmosphere, discipline, and management; evaluation of the teaching-learning processes in relation to personal goals and unit objectives; philosophy, creativity, and teaching techniques; professionalism. Selected materials for the student-teaching practicum are developed.

442 Teaching Internship Fall. student teaching full-time, weeks 8–14. 6 credits. Prerequisites: HSS 339 and 439. To be taken concurrently with HSS 442 and 443. Transportation and off-campus living costs need to be planned for in advance. Living arrangements are determined by the student; expenses may or may not be more than on campus, depending on choices made. M. Minot, A. McLennan.
Guided student-teaching experience with student assigned to cooperating public schools. Student teachers are required to live in the school communities and work under the guidance of local teachers and department faculty. Cooperating schools are located in different types of communities, represent a variety of programs, and have comprehensive programs. Students should indicate their intent as early as possible to facilitate communication and scheduling.

444 Career Environmental and Individual Development Spring, weeks 1–7. 2 credits. Limited to 25 students. S-U grades optional. No students are admitted to the class after the first session. F 12:20–2:15. R. Babcock.
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 force, manpower projection, and career planning. The course provides opportunities for students to examine their own vocational aspirations. Emphasis is on how the helping professional interacts with clients or students in preparing for, adjusting to, and maintaining jobs and careers.

446 Teaching for Reading Competence: A Content-Area Approach Fall, 2 or 3 credits. S-U grades optional.
M W 3:30–9:30 p.m. Staff.
The teaching 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 materials to be used in a setting appropriate for the student. Opportunities to use materials in a field setting, formal or informal, may be arranged if desired. If fieldwork is selected, the cost of transportation to the field setting is to be provided by the student.

452 Advanced Field Experience in Community and Family-Life 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. Staff.

471 Social Work Practice I Fall, 3 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 10:10–12:05; fieldwork, T R for 8 hours each day. D. Ritchie and staff.

472 Social Work Practice II Spring, 9 credits. Limited to 25 social work students. Prerequisite: grade of B or better in HSS 471 and satisfactory performance in fieldwork. M W 10:10–12:05; fieldwork, T R for 8 hours each day. C. Shapiro and staff.

Building on the junior-year social work courses, this seminar will integrate intermediate-level theory and practice content and examine recurring themes in professional practice.

474 Introduction to Social Planning Fall. 3 credits. Limited to sophomores, juniors, and seniors. M W 3:35–4:50. A. Hahn.
The course will introduce students to planning concepts and processes. The demographic, geographic, economic, and public health components of planning will be discussed. The students will be given specific planning assignments and asked to work in planning teams.

475 Social Policy Spring, 3 credits. Prerequisites: HSS 370 or Government 111 or Sociology 141: S-U grades optional. Students should have field or work experience in a human-service program before or while taking this course. M W F 9:30–10:45.
An examination of the policy-making process and the significance of national policies as they affect the distribution of social services. Frameworks for analyzing social policy are used to evaluate existing social programs and service delivery systems. Implications for change in policies at the national, state, and local levels are discussed.

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.

650 Teaching Human Services in Higher Education Fall. 3 credits. S-U grades optional. M W 11:15, plus 1 hour to be arranged. A. McNelhannon.
Basic strategies for planning and implementing instruction in human services in higher education—for example, in-service, training programs, and two- and four-year colleges. Types of issues examined by researchers include variables involved in modes of learning, structure and content, and instructional settings. Emphasizes conceptualizing the teaching-learning process. Students are expected to develop instructional plans related to interests in the human services and to develop a repertoire of teaching skills through professional sequences in microteaching, classroom teaching, or both.

651 Adult Development and the Provision of Human Services Spring. 3 credits. S-U grades optional. W 7:30–10:30 p.m. H. Burris.
Provides a survey of adult development. Forces affecting the various periods, stages, passages, life tasks, or roles related to the adult life cycle are examined. Biological factors, interpersonal relationships, social and cultural influences, and historical events are examined in relationship to perspectives on adult development. Opportunity for an empirical investigation of an adult population is provided. Implications from theories and student-collected data are examined in relationship to the provision of human services programs.

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 programs. Students have opportunities to participate 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 level.

653 Consulting and Supervisory Roles in Human Services Fall. 3 credits. S-U grades optional. Offered alternate years. M. Mindo.
Analysis of theories and practices of consulting and supervision and their application in higher education and in human service agencies at the national, state, and local levels. Students make observations and apply consulting and supervisory skills in settings related to their professional goals.

Issues that confront administrators of higher education and continuing professional education in the human services are analyzed: policy in higher education, student selection and retention, program development, program evaluation, accreditation, finance, professional staff development. Issues are developed by resource persons in higher education.

A review of public policy process in education, health, and social welfare services as it relates 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.

A review of issues in the translation of research, resources, and policy in the human service, 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-cause incentive program evaluation, administration, and change in the context of design and implementation.
664 The Intergovernmental System and Human Service Program Planning  Fall: 3 credits  S-U grades optional.
T R 3:35–5:15, J. Ziegler.
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, implementation, and evaluation are stressed (for example, planning and managing the activities designed for in-service and continuing education of practitioners in helping professions, such as home economics teachers, social workers, public health planners, and adult educators. Specific content of each course varies with group being served, but includes work and class time appropriate to the number of credits).

600 Measurement for Program Evaluation and Research  Fall: 3 credits.
T R 10:10–11:25, Staff.
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 techniques, content analysis, and data coding. Attention is given to issues such as ethical and managerial concerns that arise in applied settings.

691 Program Evaluation and Research Design  Spring: 3 credits. Prerequisite: introductory statistics course strongly recommended.
T R 2:30–3:45, W. Trochim.
Introduction to the theory of research design and its application to the evaluation of human service programs. Major topics include experimental, quasi-experimental, cross-sectional, and exploratory research designs; basic sampling theory; and the use of qualitative and quantitative methods. Attention is given to issues that arise in the application of research designs to the evaluation of programs, including problems of randomization, causal inference, replication, and utilization of results. Skills covered include stating and testing hypothesis, critical analysis of research reports, computer simulation, and development of a research proposal.

692–693 Program Evaluation In Theory and Practice  Fall: 692, 3 credits; 693, spring: 8 credits. Prerequisites for HSS 692: 690 and 691, or permission of instructor. Prerequisite for HSS 693: 692. Students must register for both semesters. Offered alternate years.
C. McClintock.
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).

696 Qualitative Methods for Program Evaluation  Spring: 3 credits. Prerequisites: HSS 690 and 694 or equivalents.
M W F 10:10, Staff.
This course explores the issues related to qualitative research methodology and the evaluation of human service programs. Topics include the underlying epistemological assumptions, questions of entry into setting, data collection, data analysis, confidentiality of participants, and the ethics of qualitative research approaches. It is the aim of the course to delineate those settings and researchable questions where such a methodology is or is not appropriate, as well as the benefits and limitations inherent in employing it.

704–705 Internship in Human Service Studies  Fall, spring, or summer. 1–15 credits. S-U grades optional.
Hours to be arranged. Graduate faculty and 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. B. Trochim.
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.

899 Master’s Thesis and Research  Fall and spring. Credit to be arranged. Prerequisite: permission of the graduate committee and the instructor. S-U grades optional. Hours to be arranged. Department graduate faculty.

999 Doctoral Thesis and Research  Fall and spring. Credit to be arranged. Prerequisite: permission of the chairperson of the graduate committee and the instructor. S-U grades optional. Hours to be arranged. Department graduate faculty.

Topical Seminars and Practicums
Seminars and practicums, offered irregularly, based on faculty and student interest, with changing topics and instructors. Content, time, credits, and instructors to be announced. Seminars and practicums offer concentrated study in a specific human service area or in the education, planning, or evaluation processes within human services.

507–508 Professional Improvement I and II  Fall, spring, or summer. 3–6 credits. Offered alternate years.
This course is an introduction to the social psychology of small groups and the development of 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.

613 Seminar in Health and Mental Health Services  Topics include alcohol and drug problems, developments in health and mental health policy and planning, and community mental health services.

658 Practicum in Higher Education in Human Services  Activities include college teaching, in-service education, and other efforts related to the preparation of professionals in the human services.

659 Seminar in Higher Education in Human Services  Topics include professional versus agency belief systems, teacher education, developments in higher education in the human services. Two or more human services are examined.

668 Practicum in Program Planning and Development  Activities include preparing plans, organizational change, and developing resources and community support.

669 Seminar in Program Planning and Development  Topics include microlevel program planning, third-sector organizations, and intergovernmental influences on program planning, program evaluation, 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 the 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, social workers, public health planners, and adult educators. Specific content of each course varies with group being served but includes work and class time appropriate to number of credits.
Nutritional Sciences Courses

See course descriptions under the Division of Nutritional Sciences, pp. 335–339.

Faculty Roster

Allen, Josephine A., Ph.D., U. of Michigan. Asst. Prof., Human Service Studies
Anderson, Carol L., Ph.D., Iowa State U. Assoc. Prof., Human Development and Family Studies
Babcock, Robert A., Cornell U. Assoc. Prof., Human Service Studies
Barr, Donald J., Ph.D., Indiana U. Assoc. Prof., Human Service Studies
Baweja, Michael A., Ph.D., Harvard U. Asst. Prof., Human Development and Family Studies
Bayer, Helen T., Ph.D., Cornell U. Prof., Human Development and Family Studies
Becker, Franklin D., Brown U. of California at Davis. Assoc. Prof., Design and Environmental Analysis
Biedenbrenner, Judy E., U. of Nebraska. Assoc. Prof., Cooperative Extension
Boedigheimer, Robert R., U. of North Iowa. Assoc. Prof., Design and Environmental Analysis
Bryant, W. Keith, Ph.D., Michigan State U. Prof., Consumer Economics and Housing
Burris, Helen W., Ph.D., Iowa State U. Asst. Prof., Human Service Studies
Bushnell, Allen R., M.F.A., Cranbrook Acad. of Art. Assoc. Prof., Design and Environmental Analysis
Cech, John, Ph.D., U. of California at Los Angeles. Assoc. Prof., Human Development and Family Studies
Chen, Ru, Ph.D., Florida State U. Asst. Prof., Design and Environmental Analysis
Clay, Sharon L., Ph.D., Massachusetts Inst. of Technology. Prof., Consumer Economics and Housing
Cochran, Moncrief M., Ph.D., U. of Michigan. Assoc. Prof., Human Development and Family Studies
Condon, John C., Ph.D., U. of California at Los Angeles. Assoc. Prof., Human Development and Family Studies
Corliss, Steven W., Ph.D., Pennsylvania State U. Asst. Prof., Human Development and Family Studies
Dawson, John C., Ph.D., Oregon State U. Assoc. Prof., Human Development and Family Studies
Deyo, Robert A., Ph.D., University of North Carolina. Assoc. Prof., Consumer Economics and Housing
Dorsey, John B., Ph.D., U. of Wisconsin. Assoc. Prof., Consumer Economics and Housing
Folch, John, Ph.D., U. of Michigan. Assoc. Prof., Human Service Studies
Garnier, Jennifer L., Ph.D., U. of Wisconsin. Assoc. Prof., Consumer Economics and Housing
Hahn, Alan J., Ph.D., Indiana U. Assoc. Prof., Human Service Studies
Hall, Bruce F., Ph.D., U. of California at Berkeley. Asst. Prof., Consumer Economics and Housing
Harding, John S., Ph.D., Harvard U. Prof., Human Development and Family Studies
Heck, Ramona, Ph.D., Purdue U. Asst. Prof., Consumer Economics and Housing
Hogarth, Jeanne M., Ph.D., Ohio State U. Asst. Prof., Consumer Economics and Housing
Lazar, Irving, Ph.D., Columbia U. Prof., Human Service Studies
Lea, Michael J., Ph.D., U. of North Carolina. Asst. Prof., Consumer Economics and Housing
Lee, Lee C., Ph.D., Ohio State U. Assoc. Prof., Human Development and Family Studies
Lemley, Ann T., Ph.D., Cornell U. Asst. Prof., Design and Environmental Analysis
Lust, Barbara C., Ph.D., U. of New York. Assoc. Prof., Human Development and Family Studies
McClelland, Charles C., Ph.D., SUNY at Buffalo. Assoc. Prof., Human Service Studies
McLean, W. Jean, M.S., Michigan State U. Prof., Design and Environmental Analysis
McLennan, Claire A., Ph.D., Texas Tech U. Asst. Prof., Human Service Studies
Mankowski, Leonard E., M.A., Cornell U. Asst. Prof., Design and Environmental Analysis
Markovitch, Nicholas C., Ph.D., U. of New Mexico. Asst. Prof., Design and Environmental Analysis
Maynes, E. Scott, Ph.D., U. of Michigan. Prof., Consumer Economics and Housing
McGahan, G. Cory, M.F.A., U. of Texas. Assoc. Prof., Design and Environmental Analysis
Mintz, Marion, Ph.D., Cornell U. Prof., Human Service Studies
Moehl, D. Phyllis, Ph.D., U. of Minnesota. Assoc. Prof., Consumer Economics and Housing
Mueller, B. Jeanne, Ph.D., U. of Wisconsin. Prof., Human Service Studies
Nelson, Helen Y., Ph.D., U. of Minnesota. Prof., Human Service Studies
Noble, Lucinda A., Ph.D., U. of North Carolina. Prof., Human Service Studies
Oberdorfer, Sharon G., Ph.D., Cornell U. Assoc. Prof., Design and Environmental Analysis
Olender, Edward R., Ph.D., U. of Illinois. Assoc. Prof., Design and Environmental Analysis
Pollack, Patricia, Ph.D., Syracuse U. Asst. Prof., Consumer Economics and Housing
Potteiger, W. Dean, Ph.D., U. of Illinois. Assoc. Prof., Consumer Economics and Housing
Purchase, Mary E., Ph.D., Iowa State U. Prof., Design and Environmental Analysis
Riccucci, Henry N., Ph.D., Fordham U. Prof., Human Development and Family Studies
Richie, Dennis, Ph.D., Syracuse U. Asst. Prof., Human Service Studies
Robinson, Jean R., Ph.D., Radcliffe C. Prof., Consumer Economics and Housing
Salford, Nancy C., Ph.D., Purdue U. Assoc. Prof., Design and Environmental Analysis
Savin-Williams, Richard C., Ph.D., U. of Chicago. Assoc. Prof., Human Development and Family Studies
Schoggen, Phil, Ph.D., U. of Kansas. Prof., Human Development and Family Studies
Schwartz, Peter, Ph.D., Harvard U. Asst. Prof., Design and Environmental Analysis
Shapiro, Constance H., Ph.D., Cornell U. Asst. Prof., Human Service Studies
Shay, Anne B., Ph.D., U. of Massachusetts. Assoc. Prof., Consumer Economics and Housing
Sims, William R., Ph.D., Massachusetts Inst. of Technology Prof., Design and Environmental Analysis
Sloan, Gary D., Ph.D., North Carolina State U. Asst. Prof., Design and Environmental Analysis
Straight, Clara J., M.F.A., U. of Colorado. Prof., Design and Environmental Analysis
Street, Lloyd C., Ph.D., U. of California at Berkeley. Assoc. Prof., Human Service Studies
Suci, George J., Ph.D., U. of Illinois. Prof., Human Development and Family Studies
Trochim, William M. K., Ph.D., Northwestern U. Asst. Prof., Human Service Studies
Walker, Elaine, Ph.D., U. of Missouri. Asst. Prof., Human Development and Family Studies
Watkins, Susan M., M.S., Pennsylvania State U. Assoc. Prof., Design and Environmental Analysis
Yerka, Bettie L., Ph.D., Syracuse U. Assoc. Prof., Human Service Studies
Ziegert, Beate I. E., B.A., U. of Toronto (Canada). Asst. Prof., Design and Environmental Analysis
Ziegler, Jerome M., M.A., U. of Chicago. Prof., Human Service Studies
Zober, Mark, Ph.D., Brandeis U. Adj. Asst. Prof., Human Service Studies
Zorn, Peter M., U. of California at Davis. Asst. Prof., Consumer Economics and Housing
New York State School of Industrial and Labor Relations

Administration
Charles M. Rehmus, dean
Lois S. Gray, associate dean, extension and public affairs
Robert E. Doherty, associate dean, academic affairs
Frank B. Miller, director, Office of Resident Instruction
Shirley Harper, librarian
Ronald G. Ehrenberg, director, research
Frisco Benson, director, publications
George M. Calvert, director of budget
Lawrence K. Williams, graduate field representative
Donald E. Cullen, editor, Industrial and Labor Relations Review

Degree Program

Degree
B.S.

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 six hundred undergraduates and approximately one hundred graduate students.

The school's home is a unified complex of classroom buildings, library, and administrative and faculty offices clustered around two courtyards. Daily classroom activities and other school events provide many opportunities for ILR students and faculty to interact. Students are members of the larger Cornell community and participate 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. Enrollment of women has been increasing in recent years, and recent entering classes have been 50 percent women.

Students enrolled in the School of Industrial and Labor Relations at Cornell may take a substantial number of courses in the other six undergraduate colleges and schools of the University, including the College of Arts and Sciences. Cornell students have access to all of the libraries and other University facilities.

The school operates in four areas: (1) undergraduate and graduate resident instruction, (2) extension and public service, (3) research, and (4) publications. It provides instruction to young people on campus 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
- Economic and Social Statistics
- International and Comparative Labor Relations
- Labor Economics
- Organizational Behavior
- Personnel and Human Resource Studies

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 Resident Instruction

Staff members from the Office of Resident Instruction, 101 Ives Hall, work closely with faculty and faculty committees to administer degree programs for the school. The office's responsibilities include the admitting and orienting of new students, maintaining students' personal and academic records, administering the faculty advisory system and academic standards, counseling students on personal and academic problems, and administering the school's financial aid programs. The office also provides a career counseling service and works closely with seniors who are planning graduate study.

Counseling and Advising

Entering freshmen will be provided advising on orientation, academic procedures, and course registration throughout the first year by counselors in the Office of Resident Instruction.

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 Resident Instruction.

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 special programs is to aid in increasing representation of state residents from minority groups historically underrepresented in higher education. 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 the Office of Admissions.

Study Options

Several study options are open to ILR undergraduates, making it possible to tailor a program to fit specific needs.

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 Cornell's Graduate School of Business and Public Administration (B&PA), earning their bachelor's degree in ILR and a master's degree in B&PA 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, or as much as a year at a foreign university. Others opt for internships that give them practical field experience, such as a summer in New York City's Office of Collective Bargaining or a term doing research for the New York State Senate Committee on Labor in Albany.

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, elsewhere in New York State, and even in foreign countries. These courses take some students to the state legislature in Albany or to community-action groups. Others may work in prisons, institutions, or school districts.

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

Students who want to study at another institution for a semester or for a year and receive credit toward their undergraduate degree may petition to study in absentia. This permits students to study at a foreign university or at another American school that offers a program unavailable at Cornell. Eligibility requires good standing and approval of study plans by the director of resident instruction. 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 chair of the department that might have offered the respective course, or to a counselor in the Office of Resident Instruction if the course is more appropriate as an 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 Resident Instruction. Counselors will assist students in petitioning for 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

(51 credits)

The current 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.

<table>
<thead>
<tr>
<th>Course or Subject</th>
<th>Credits</th>
<th>Term</th>
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<tbody>
<tr>
<td>Freshman year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman Seminars*</td>
<td>6</td>
<td>Fall and spring</td>
</tr>
<tr>
<td>Econ 101–102, Micro, Macro Economics*</td>
<td>6</td>
<td>Fall and spring</td>
</tr>
<tr>
<td>Psych 101, Introduction to Psychology*</td>
<td>3</td>
<td>Fall</td>
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<tr>
<td>ILR 100–101, History of Industrial Relations in the United States</td>
<td>6</td>
<td>Fall and spring</td>
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<tr>
<td>ILR 140, Development of Economic Institutions</td>
<td>3</td>
<td>Spring</td>
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<tr>
<td>ILR 120–121, Macro, Micro Organizational Behavior and Analysis</td>
<td>6</td>
<td>Fall and spring</td>
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<tr>
<td>Physical education</td>
<td>0</td>
<td>Fall and spring</td>
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<tr>
<td>Sophomore year</td>
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<tr>
<td>ILR 201, Labor Relations Law and Legislation</td>
<td>3</td>
<td>Fall</td>
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<tr>
<td>ILR 240, Economics of Wages and Employment</td>
<td>3</td>
<td>Fall</td>
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<tr>
<td>ILR 210–211, Statistics</td>
<td>6</td>
<td>Fall and spring</td>
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<tr>
<td>ILR 200, Collective Bargaining</td>
<td>3</td>
<td>Spring</td>
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<tr>
<td>ILR 260, Personnel Management</td>
<td>3</td>
<td>Fall or spring</td>
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<tr>
<td>Junior year</td>
<td></td>
<td></td>
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<tr>
<td>ILR 340, Economic Security</td>
<td>3</td>
<td>Fall</td>
</tr>
<tr>
<td>Elective Courses</td>
<td>(69 credits)</td>
<td></td>
</tr>
</tbody>
</table>

From the courses offered by the school, students must select a minimum of 30 credits of ILR elective courses. No more than 9 of these 30 credits may be satisfied by ILR 499, Directed Studies, or ILR 497–498, Internships, or ILR 495, Honors Program.

The remaining 39 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 Graduate School of Business and Public Administration; 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.

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 approved explanation for absence from class may occasionally be granted in advance of the expected absence by the Office of Resident Instruction. 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 record of clinic or infirmary treatment;
3) serious illness or death in immediate family;
4) other circumstances beyond the student's control.

A request for approval of an absence should, when possible, be made to the Office of Resident Instruction before the date of expected absence. A reported and approved explanation of 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 Resident Instruction 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. Copies are available from the Office of Resident Instruction, 101 Ives Hall.

Dean's List

A Dean's List is compiled for each of the four undergraduate classes each term on the seventh day following receipt of final grades from the registrar. Eligibility for the Dean's List is determined by applying all of the following criteria:

1) achievement of a term average for freshmen of 3.3 or better; for sophomores of 3.4 or better; and for juniors and seniors of 3.6 or better
2) a minimum course load for the term of 12 letter-graded credits
3) completion of all courses registered for at the beginning of the term
4) satisfaction of all good-standing requirements

Academic Standing

Good standing requires that all of the following criteria be met at the end of each term:

1) An average of C- (1.7) for the semester's work, including a minimum of 6 completed and graded credits
2) No failing grades in any course, including physical education
3) A cumulative average of C- (1.7) for all completed terms

At the end of any term a student fails to maintain good standing or if overall academic performance is so marginal as to endanger the possibility of meeting school and University degree requirements, his or her record is reviewed by the Committee on Academic Standards and Scholarships. The committee may issue a written warning to the student at that time.

Involuntary Separation from the School for Academic Reasons

A student may be denied permission to reregister at the end of any term when he or she has failed:

1) to establish good standing after a semester on warning;
2) to maintain an average of 1.7 in any term after a previous record of poor standing;
3) to achieve good standing after being on warning any two previous semesters;
4) two or more courses in one term or has a term average of 1.0 or below.

The Academic Standards and Scholarship Committee may decide to permit a student to remain on warning for more than one semester if there has been significant improvement even though the cumulative average is still below 1.7.

S-U Grading Policy

An undergraduate may register to receive a final grade of S (Satisfactory) or U (Unsatisfactory) in courses that offer this option—either in the school or in other divisions of the University—subject to the following conditions:

1) The S-U option may be used in ILR and in out-of-college course electives only, not in directed studies.
2) Students are limited to registering in two S-U courses a term.
3) S-U registration is limited to 4 credits for each course.
4) Students registering for S-U grades must be in good standing.
5) Students must fulfill the graduation requirement of 105 letter-graded 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 credited. Instructors may grant an incomplete grade for a limited number of clearly valid reasons, but only to students with substantial equity in a course. A firm and definite agreement on the conditions under which it may be made up must be made with the instructor.

The school's policy allows a maximum of two full terms of residence for removal of an Incomplete. An Incomplete grade not made up within this time automatically becomes an F.

Special Academic Programs

In order to meet the special academic objectives of some students, the school's faculty has established several special academic programs. For additional information, students should contact a counselor in the Office of Resident Instruction. Counselors will explore the program with students to help them decide if it suits their interests.

Dual Registration in Business and Public Administration

Dual informal registration in the School of Business and Public Administration (B&PA) leads to a Bachelor of Science degree in industrial and labor relations and a master's degree in business and public
administration after five years of study and is open to students who meet the requirements of the Graduate School of Business and Public Administration. Early planning by each student, preferably in the sophomore year, is desirable to ensure that B&PA expectations and the ILR curriculum requirements are fulfilled. Students interested in the very limited and selective program of the Graduate School of Business and Public Administration should contact the Admissions Office, 319 Maitali Hall, and a counselor at the Office of Resident Instruction.

Five-Year Master of Science Degree Program

With early planning it is possible to earn the M.S. degree in a four-year period. A program is designed specifically for those who wish to concentrate their 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 Resident Instruction after their freshman year.

Semester off Campus

For the past few years the semester-off-campus program has provided students with a vivid understanding of problems in labor and industrial relations through observation and participation in "real-life" labor problems. A small 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 and seminars drawing on fieldwork experience with employers, labor organizations, and government agencies. More information about this program is available from the Office of Resident Instruction.

Junior Year Abroad

A few students each year are granted permission to register in absentia and continue their studies at a foreign university. Although the school does not have a fixed program for foreign study, students who have studied abroad generally receive some credit for their course work and have found it a very rewarding experience. Students may attend a foreign university of their choice, but guidance in finding and selecting programs is available from the Office of Resident Instruction and from the Career Center, 14 East Avenue.

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: &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 such topics 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, D. Lipsky, L. Mishel, P. Ross, R. Seiber. A comprehensive study of collective bargaining, the negotiation and scope of contracts, the day-to-day administration of contracts; the major substantive issues in bargaining, including their implication for public policy, and the problem of dealing with industrial conflict.

201 Labor Relations Law and Legislation

Fall or spring; 3 credits. M. Gold, J. Gross, K. Hanslowe, R. Lieberwitz. A survey of the law governing labor relations. The legal framework in which the collective bargaining relationship is established and takes place is analyzed. Problems of the administration and enforcement of contracts; the major substantive issues are considered, as are problems of protecting individual employee rights in the collective labor relations context. Also serves as an introduction to the legal system and method and to legal and constitutional problems of governmental regulation of industrial and labor relations.

301 Labor Union Administration

Fall; 3 credits. Prerequisites: &LR 100 and 201. G. Brooks, C. Daniel, R. Seiber. A review of the operations of American unions, including a general theoretical framework, but with major emphasis on operating experience. Topics include the formal government of unions; organizational or institutional purposes and objectives; both unions and employers during organizing efforts; and the dramatic experience of the Yiddish-speaking Jewish working classes between 1924 and 1948. G. Korman. Designed to explore the social, economic, and political implications of organizing, bargaining, and labor's participation in the political process. Topics include 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.

302 Research Seminar in the Social History of American Workers

Fall; 4 credits. Limited to upperclass students who have demonstrated their ability to undertake independent work and who have received permission of the instructor. G. Korman. An examination of a different subject each year.

303 Seminar in the History, Administration, and Theory of Industrial Relations in the United States

Fall; 4 credits. Prerequisite: &LR 100 and 201. G. Brooks, C. Daniel, R. Seiber. Designed to explore the social, economic, and political implications of organizing, bargaining, and industrial relations in the history of the United States. Examines the different subject each year.

304 Seminar in the History, Administration, and Theory of Industrial Relations in the United States

Fall; 4 credits. Prerequisite: &LR 100 and 201. 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 Politics

Fall or spring; 3 credits. Prerequisite: &LR 101. 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 frame it—men and women of business, government, and the law, as well as leaders of 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. Open to sophomores, juniors, and seniors. G. Korman. This course is a comparative history examining 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.

400 Union Organizing

Spring; 7 weeks only. 2 credits. D. Cullen, R. Donovan. A course in labor history and political science, this course explores various aspects of unions' attempts to organize workers: why some workers join unions and others do not; the techniques used by boycotts and employer-sponsored campaigns; and the present law of organizing and proposed amendments to that law. Includes an examination and a research paper.

401 The Law of Workers' Compensation

Fall; 7 weeks only. 2 credits. J. Burton. This course bridges the gap between &LR 200 (500), Collective Bargaining, and &LR 602, Arbitration.
focuses on various aspects of dispute settlement process prior to final resolution. The intent of the course is to expand the knowledge of students rather than to develop personal skills. It includes such topics as (1) the historical development of contractual grievance process, (2) the merits of various alternative grievance procedures that have been adopted by unions and management in the United States, (3) the impact of external law on the behavior of the parties to the adjustment process, (4) a comparison of the U.S. system with systems in other industrialized economies, (5) current issues and problems in the system, (6) nonunion grievance processes, and (7) ongoing experimental alternatives to the standard systems.

406 History of the Black Worker in the United States
Fall. 3 credits. Prerequisite: I&LR 100 or 502 or permission of instructor.
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.

407 Contemporary Trade Union Movement
Spring. 3 credits. Prerequisites: I&LR 100 or 502 or permission of instructor.
C. Daniel.
An examination of the contemporary history, administration, policies, and problems of American trade unions. Each semester the course focuses on particular aspects of the labor movements.

495 Honors Program
Fall and spring (yearlong course). 3 credits each term. Admission to the I&LR Honors Program must 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) an honors project, entailing research leading to completion of a thesis, must be proposed to an I&L faculty member who agrees to act as thesis supervisor; (c) the project, endorsed by the proposed faculty sponsor, is submitted to the Committee on Academic Standards and Scholarships. Accepted students embark on a two-semester sequence. The first semester consists of determining a research design, familiarizing with relevant literature, and preliminary data collection. The second semester involves completion of the data collection and preparation of the honors thesis. At the end of the second semester, the candidate is examined and the thesis is presented by the thesis sponsor, after the thesis has been approved by the Academic Standards Committee.

497-498 Internship
Fall or spring. 3 and 6 credits.
Fall. 3 credits. All requests for permission to register for an internship must be approved by the faculty member who will supervise the student and the chairman of the faculty member's academic department before submission for approval by the Committee on Academic Standards and Scholarship. Upon approval of the internship, the Office of Resident Instruction will register each student for 497, for 3 credits graded A+ to F, for individual research, and for 498, for 6 credits graded S-U, for completion of a professionally appropriate learning experience, which is graded by the faculty sponsor.

499 Directed Studies
Fall or spring. 3 credits.
For individual research, conducted under the direction of a member of the faculty, in a special area of labor relations not covered by regular course offerings. Registration is normally limited to seniors who have demonstrated ability to undertake independent work. Eligible students should consult a counselor in the Office of Resident Instruction at the time of course registration to arrange for formal submission of their projects for approval by the Academic Standards Committee.

500 Collective Bargaining
Fall or spring. 3 credits. Open only to graduate students. Recommended: I&LR 501 taken previously or concurrently.
D. Cullen, D. Lipsky, L. Mishel, R. Seeber.
A comprehensive study of collective bargaining, with special emphasis on philosophy, structures, processes of negotiations, and administration of agreements. Attention is also given to problems of handling and settling industrial controversy, various substantive issues, and important developments and trends in collective bargaining.

501 Labor Relations Law and Legislation
Fall or spring. 3 credits.
M. Gold, J. Gross, K. Hanslowe, 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 process takes place is considered and analyzed. Proposition and enforcement of the collective agreement are considered, as are problems of protecting the individual member-employee rights with the union.

502 Labor Union History and Administration
Fall or spring. 3 credits.
A presentation of labor unions 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 various types of units, such as those in construction, maritime trades, entertainment, transportation, and basic industry.

503 Advanced Seminar in Labor Arbitration
Spring. 3 credits. Limited to seniors, junior and graduate students. Prerequisite: I&LR 602 or equivalent and permission of instructor.
J. Gross, K. Hanslowe.
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 preparation of a case, to the handling of prehearing and posthearing briefs, and the writing of an arbitration opinion and award. To the investigation and evaluation of the experience of labor arbitrators, with selected case problems arising in state and federal employment and public education as well as in the private sector.

504 The Bargaining Process: Theory and Practice
Fall. 3 credits. Prerequisite: I&LR 200 or 500.
D. Lipsky.
Focus is on theories of the bargaining process, including economic, behavioral, game-theoretic, political, and social-psychological approaches to the bargaining 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 considered. Attempts at empirical verification of various bargaining theories will also be considered. Theoretical and analytical principles will be developed in assigned readings and in class discussions. The relevance and practical applicability of these principles will be explored through mock negotiations and other exercises.

602 Arbitration
Fall or spring. 4 credits. Limited to 21 students. Prerequisites: undergraduates, I&LR 200; graduate students, I&LR 500.
J. Gross, C. Rehmus.
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 hearsay rules, and the role of the arbitrator. The conduct of an arbitration hearing, and the preparation of an arbitration opinion.

603 Governmental Adjustment of Labor Disputes
Fall or spring. 4 credits. Prerequisites: undergraduates, I&LR 200; graduate students, I&LR 500.
D. Quiggin.
An examination of the various governmental techniques for dealing with labor disputes in both the private and public sectors, including mediation, fact- finding arbitration (both voluntary and compulsory), the use of injunctions, and seizure. The course also examines the application of these techniques under the Railway Labor Act, Taft-Hartley Act, and various state acts.

604 Readings in the Literature of American Radicalism and Dissent
Fall or spring. 3 credits. Limited to seniors and graduate students. Prerequisites: seniors, I&LR 100 and 101; graduate students, I&LR 502.
Limited to seniors and graduate students. Each term, concentration is on a different historical aspect of American radicalism and dissent. Examples of its forms 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 Lovestone, and William Z. Foster; economic dissent—Harry George, Thorstein Veblen, and Francis Everett Townsend; and the black nationalism—William E. B. DuBose and Marcus Garvey.

605 Readings in the History of Industrial Relations in the United States
Fall. 3 credits.
Limited to seniors and graduate students. Prerequisite: I&LR 100 and 101; graduate students, I&LR 502.
C. Daniel, G. Korman, J. Morris.
A seminar covering, intensively and in historical sequence, key documents, studies, legislative investigations, and memos concerning American industrial relations systems. Primarily designed to aid students in orienting themselves systematically and thoroughly in the field. Reading for study are those of Karl Marx, Mikhail Bakunin, Georges Sorel, Vladimir Lenin, Lujo Bretoni, Beatrice 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.

606 Theories of Industrial Relations Systems
Fall or spring. 3 credits. Limited to seniors and graduate students. Prerequisites: seniors, I&LR 100 and 101; graduate students, I&LR 502.
C. Daniel, G. Korman, 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 included will be those formulated by Karl Marx, Mikhail Bakunin, Georges Sorel, Vladimir Lenin, Lujo Bretoni, Beatrice 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 LR students and 10 law students. Prerequisite: permission of instructor.
J. Gross, K. Hanslowe.
The interaction of law and public policy in the arbitration of labor disputes in both the private and public sectors. Some of the topics covered include the law of arbitration, the scope of judicial review, the interaction between Title VII and arbitration, and
individual rights to due process in the handling of grievances. Students prepare briefs, argue cases, and write awards. As opportunity permits, students are invited to attend actual arbitration hearings and to write mock awards. Each student also writes a research paper on a topic within the general scope of the course and presents it in summary form to members of the seminar for criticism and evaluation.

608 Special Topics in Collective Bargaining, Labor Law, and Legislation Fall or spring. 3 credits. Prerequisites: undergraduates, &LR 201; graduate students, &LR 502. Staff. The areas of study are determined each semester by the instructor offering the seminar.

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 public government by the state will be considered.

681 Labor Relations Law Spring. 3 credits. Prerequisite: &LR 201 or 501 or equivalent. M. Gold. An advanced course in labor law, concentrating on state labor policies and their implementation. 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. S. Hamburger, R. Lieberman. 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, &LR 100 and 101; graduate students, &LR 502. G. Brooks, C. Daniel, G. Korman, J. Morris, N. Salvatore. The areas of study are determined each semester by the instructor offering the seminar.

684 Employment Discrimination and the Law Fall or spring. 4 credits. Prerequisite: &LR 210 or 501 or equivalent. M. Gold. An examination of legal problems involving employment discrimination based on race, color, religion, sex, national origin, or age. The impact of developing principles of law on preemployment inquiries and testing, seniority and promotions, and other personnel policies, practices, and procedures are discussed. The requirements of affirmative action under Executive Order 11246, as amended, are analyzed. Special attention is given to the role of state law in restricting 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. Cramer. 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 relations of public school employees, the content and the administration of collective agreements, the ideological postures of teacher organizations, and the resolution of negotiating impasses. Individual and group research projects will be required.

686 Collective Bargaining in the Public Sector Fall or spring. 3 credits. Prerequisites: undergraduates. &LR 200 and 201; graduate students, &LR 500 and 501. J. Burton, R. Donovan, P. Ross, R. Seebrook. An examination of the development, practice, and extent of collective bargaining between federal, state, and local governments and their employees. The variety of legislative approaches to such matters as representation, rights, unfair practices, scope of bargaining, impasse procedures, and the strike against government are considered along with implications of collective bargaining for public policy and its formulation.

687 Current Issues in Collective Bargaining Fall or spring. 3 or 4 credits. Limited to 25 students. Prerequisite: &LR 200 or 500. D. Cullen, D. Lipsky, P. Ross. An intensive study of significant current issues and problems facing employers and unions in their relations with each other, with particular emphasis on the substantive matters in collective bargaining agreements. A major research paper is usually required.

688 The Political Economy of Collective Bargaining Fall. 3 credits. Prerequisites: undergraduates, &LR 200 and 240; graduate students, &LR 500 and 540, or permission of instructor. L. Mishel. Focuses on both the economic analysis of unions and collective bargaining in our economy and on the economic factors that affect collective bargaining. The method is to identify and conceptualize the structural determinants of relative bargaining power. Examines both the economic outcomes of collective bargaining and current bargaining trends in a variety of industries. Topics include neoclassical and structural-interstitutionalist analyses of union power; the effect of unions on compensation, productivity, prices, and income inequality; union growth and strikes; market definition and bargaining in multinational and conglomerate corporate structures and collective bargaining; the decline of union bargaining power; unions and inflation; and concession bargaining. Approximately half the course is spent on case studies of collective bargaining in various industries (auto, steel, construction, etc.) in the private sector. A term paper is required. Topics are covered in a nonstatistical fashion.

689 Labor Education Spring. 3 credits. Limited to 15 students. A. Nash. 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 labor courses offered by universities and colleges on union education and to labor education as an occupation. The course will involve students in field activities in connection with current Extension Division programs.

703 Theory and Research in Collective Bargaining Spring. 3 credits. Open to graduate students who have had &LR 480 or 481 or their equivalents. Recommended: a statistics course beyond the level of &LR 510. D. Lipsky, R. Seebrook. This is a second-year course in collective bargaining that builds on the institutional research covered in &LR 500. The existing literature in the area of collective bargaining is appraised as its theoretical and empirical content. Efforts are made to explore the appropriate role for theory and empirical analysis in moving research in collective bargaining toward a more analytical perspective and to identify and appraise the underlying paradigms used to study collective bargaining-related issues.

705 The Economics of Collective Bargaining Spring. 3 credits. Prerequisites: undergraduates, &LR 500; graduate students, &LR 540 (or their equivalents) and an understanding of multiple regression analysis; or permission of instructor. L. Mishel. Focuses on both the economic analysis of unions and collective bargaining in our economy and on the economic forces that affect collective bargaining. The method is to identify and conceptualize the structural determinants of relative bargaining power. On this basis, the course examines both the economic outcomes of collective bargaining and current bargaining trends in a variety of industries. A tentative theoretical analysis of unionism (neoclassical, institutionalist) is compared. The statistical techniques and empirical results of research on the union effect on economic outcomes (wages, prices, inflation, profits, productivity, earnings inequality) are also evaluated. The effects of technology, corporate structures, and public policy on union bargaining power are outlined, and a number of case studies of collective bargaining in the private sector are reviewed. A term paper is required.

798 Internship Fall or spring. 1–3 credits. Designed to grant credit for individual research under direction of a faculty member by graduate students who have been selected for an internship. All requests for permission to register for &LR 798 must be approved by the faculty member who will supervise the project.

799 Directed Studies Fall or spring. Credit to be arranged. For individual research conducted under the direction of a member of the faculty.

980 Workshop in Collective Bargaining, Labor Law, and Labor History Fall and spring. 2 credits. Enrollment limited to M.S. and Ph.D. candidates in the department. S-U grades only. Staff. This workshop is designed to provide a forum for the presentation of current research being undertaken by faculty members and graduate students in the Department of Collective Bargaining and by invited guests. All M.S. and Ph.D. candidates in the department who are at work on their theses are strongly urged to enroll. Each student in the course will be expected to make at least one presentation during the year, focusing on the formulation, design, execution, and results of that student's thesis research.

Economic and Social Statistics

P. McCarthy, chairman; I. Blumen, P. Veileman

210 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: description of frequency distribution (averages, dispersion, and simple calculation); theoretical distribution to statistical inference. Prerequisite to certain of the specialized courses on applications of statistics offered in various departments.

211 Economic and Social Statistics Spring. 3 credits. Prerequisite: &LR 210. Attendance at the first lab of the term is essential. A continuation of &LR 210. Application of statistical techniques to the quantitative aspects of social
310 Design of Sample Surveys Spring. 3 credits. Prerequisite: one term of statistics. Application of statistical methods to the sampling of human populations. A thorough treatment of the concepts and problems of sample design with respect to cost, procedures of estimation, and measurement of sampling error. Analysis of non-sampling 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 attitude and opinion research.

311 Statistics II Fall. 4 credits. Prerequisite: I & L R 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.

410 Techniques of Multivariate Analysis Fall. 3 credits. Prerequisite: I & L R 311. The techniques of multivariate statistical analysis, the associated assumptions, the rationale for choices among techniques, and illustrative applications. Some matrix algebra and related mathematics are introduced. Includes regression, correlation, principle components, multivariate tests on means, variances and covariances, relations between sets of variates, and discriminatory analysis.

411 Statistical Analysis of Qualitative Data Spring. 3 credits. Prerequisite: I & L R 311. J. Blumen. An advanced undergraduate and beginning graduate course. Includes treatment of association between qualitative variates, paired comparisons, rank-order methods, and other nonparametric statistical techniques, including those related to chi-squared.

499 Directed Studies For description, see p. 322.

510 Introductory Statistics for the Social Sciences Fall or spring. 3 credits. A nonmathematical course for graduate students in the social sciences without previous training in statistical methods. Emphasis is on discussion of the 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 distributions, regression and correlation analysis, and selected topics from the area of statistical inference.

610 Seminar in Modern Data Analysis Fall. 3 credits. Prerequisite: I & L R 311 or equivalent. P. Vellerman. 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.

712 Theory of Sampling Fall. 3 credits. Prerequisite: calculus and at least one semester of mathematical statistics. A companion course to I & L R 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 p. 323.

International and Comparative Labor Relations

J. Windmuller, chairman. M. G. Clark, G. Fields, W. Galenson

330 Comparative Industrial Relations Systems I: Western Europe Fall. 3 credits (1 additional credit may be arranged with the instructor). Open to juniors and seniors.

J. Windmuller

An introduction to contemporary industrial relations in several Western industrialized countries, including Britain, France, West Germany, and Sweden. The emphasis will be on trade unions, employers and their associations, collective bargaining, the role of government, and current policy issues.

331 Comparative Industrial Relations Systems II: Eastern Europe, Japan, and the Third World 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 non-Western countries in various stages of economic development and in various political contexts, including Japan, the Soviet Union, Yugoslavia, India, and several others.

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 European countries, especially Great Britain, France, and Germany, between 1850 and 1960. Pattern 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 p. 322.

531 Comparative Industrial Relations Systems III: Eastern Europe, Japan, and the Third World Spring. 3 credits.

J. Windmuller

Students in this course will attend the lectures in I & L R 330 (see description for I & L R 330). If enrollment warrants, they will also meet separately at a time to be arranged for discussion of topics in I & L R 330 and related topics.

532 Labor in Developing Economies Spring. 3 credits.

G. Fields

Students in this course attend the lectures in I & L R 331 (see description for I & L R 331). If enrollment warrants, they will also meet separately at a time to be arranged for discussion of topics in I & L R 331 and related topics.
History, philosophies, and the economic and social effects of social security measures. Analysis of programs offering protection against economic loss due to industrial accident, temporary and permanent disability, illness, old age, premature death, and unemployment, as well as private and voluntary efforts to provide security, and the problems of integrating public and private programs. An examination is made of proposals for amending or modifying economic security measures.


R. 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. 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.

The course analyzes the problem of occupational injuries and illnesses in the United States. The first section concentrates on legal requirements, judicial interpretations, and legal implications of the Occupational Safety and Health Act, then shifts to such questions as the need for and appropriate goals of, the act; the stringency of safety standards considered in a benefit-cost framework; the difficulties in enforcing the act; and estimates of the impact of the act.

645 Politics and Markets I Fall. 4 credits.

Prerequisite: Economics 311 or 313 or permission of instructor.

R. Frank.

Focuses on applied microeconomic policy issues as a vehicle for studying the strengths and weaknesses of the market system. Topics covered include externalities, public goods, monopoly, economic regulation, and health and safety regulation.

647 Evaluation of Social Programs Spring. 4 credits.

R. Ehrenberg.

An introduction to the methodologies used by economists to evaluate the impacts of social-action programs and legislation. General evaluation methodology, cost-benefit analysis, and econometrics are discussed. Case studies are considered to illustrate the uses of these techniques, to acquaint the student with major current government programs and legislation, and to estimate these programs' economic impacts. Throughout, the primary analytic framework used by the instructor is microeconomics.

648 Politics and Markets II Spring. 4 credits.

Prerequisites: Economics 311 or 313 or permission of instructor.

R. Frank.

Employs economic analysis in the study of the conflict between the individualist and collectivist view of society. It begins with an examination of the ethical underpinnings of economic analysis and proceeds to consider such specific topics as corporate responsibility, health and safety regulation, consumer protection regulation, and the economics of discrimination.

744 Seminar in Labor Economics Fall 3 credits. I&LR 744 and 745 constitute the Ph.D.-level sequence in labor economics.

R. Ehrenberg.

Reading and discussion of selected topics in labor economics. Applications of economic theory and econometrics to the labor market and human resource areas.

745 Seminar in Labor Economics (also Economics 642) Spring. 3 credits.

G. Jakubson.

Reading and discussion of selected topics in labor economics in the fields of theory, institutions, and policy.

796 Internship

For description see p. 323.

799 Directed Studies

For description see p. 323.

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; L. Gruenfeld, T. Hammer, R. Stern, P. Tolbert, H. Trace, L. Williams

120 Introduction to Macro Organizational Behavior and Analysis Fall. 3 credits.

S. Bacharach.

The relationship between industry and the economy as a whole and its implications for other social institutions in American society (including stratification, politics, and American values) is discussed. The nature of industrial organizations and of complex organizations in general, emphasizing authority relations, goals, the division of labor, and bureaucracy.

121 Introduction to Micro Organizational Behavior and Analysis Spring. 3 credits.

S. Bacharach.

Deals with the relationship between the individual and the organization and such basic psychological processes as need satisfaction, perception, attitude formation, and decision making. The individual is described and examined as a formal and informal group member. Within this area, particular emphasis is placed on leadership, problem solving, and conflict resolution.

222 Studies in Organizational Behavior: Regulating the Corporation Fall. 3 credits.

R. Stern.

The course examines public and private power from an organizational perspective. The resource-dependence approach to organization-environment relationships provides a framework for interpreting government attempts at the regulation of corporate behavior. Topics cover the structure and functioning of government regulatory agencies and corporate responses to regulation, including corporate strategy, management, and political influence. The role of interest groups such as consumer or citizens organizations is also considered. Research and case materials focus on the implementation of environmental protection, occupational health and safety, equal opportunity, antitrust, and rate-setting regulations.
320 The Psychology of Industrial Engineering Fall. 4 credits
T. Hammer.
A study of the human factors in the industrial engineering of work, work places, tools, and machinery. The course examines the aspects of individual and social psychology that operate in the work setting and that should be taken into account in the design of jobs. These include limitations of the human sensory system, individual differences in skills, abilities, motives, and needs; group dynamics, intrinsic motivation; job satisfaction; conflict.

321 Stress at Work Fall or spring. 4 credits
Staff.
Explores the impact of the social psychological demands of work environments on employee stress. Among the topics to be discussed are (1) conceptual models of stress, (2) social, situational, and personal factors mediating the effects of stressors, and (3) adaptive coping processes. Readings will focus on the person-environment fit in the work setting, and social support networks, as well as on environmental stressors such as noise, high density, job structure, and unemployment. Specific attention will be given to the stressors faced by employees in service occupations.

322 Comparative Theories of Organizational Behavior and Social Character Fall. 3 credits
L. Gruenfeld.
A comparative social-psychological approach is used to examine theories of work, authority, conflict, and change in employment organization.

323 Introduction to the Study of Attitudes Fall. 4 credits. Open to juniors and seniors.
T. Hammer.
Designed to acquaint the student with what is known about (1) origins of human attitudes, (2) the determinants of attitude change, and (3) the measurement of attitude differences. Studies employing clinical, experimental, and survey techniques are discussed. Each student designs, executes, and analyzes his or her own research study.

324 Organizations and Deviant Behavior Spring. 3 credits. Limited to 40 students. Prerequisite: one or more courses in both sociology and psychology.
H. Trice.
Focus is on the relationship between organizations and deviant behavior. Covers (1) the nature and etiology of psychiatric disorders, particularly schizophrenia, the psychoneuroses, and psychosomatic disorders; (2) organizational factors related to these disorders and to the more general phenomena of role conflict and stress; (3) an examination of alcoholism as a sample pathology, in terms of personality characteristics and precipitating organizational factors; (4) evaluation of organizational responses to deviance; (5) the nature of self-help organizations such as Alcoholics Anonymous; and (6) the structure and functioning of the mental hospital.

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 hierarchy will be examined to see what additional power they add to the explanation of social inequality, particularly in regard to income attainment. As the central unit of analysis in the course will be the organization, the analysis will be included that deals with the evolution of current control and compensation structures in large-scale organizations.

326 Sociology of Occupations Fall. 3 credits. Prerequisite: one or more courses in sociology.
H. Trice.
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 personal occupations with the career and organizational patterns of other occupations. A major sociological theme is the relationship between occupational structure and workplace structure.

327 Psychology of Industrial Conflict Fall. 4 credits.
Staff.
An application of frustration theory to the analysis of conflict and stress in organizations and society. Comparisons are made between industrial relations, race relations, international relations, and other settings. Readings include behavioral research findings from a variety of studies in industry. Relevant contributions from experimental, social, and clinical psychology are also considered.

328 Cooperation, Competition, and Conflict Resolution Spring. 4 credits. Prerequisite: two courses in social psychology or equivalent.
An examination of the 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 or competitive bonds between parties to a conflict. 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 Sociological Analysis of Organizations Fall. 3 credits. Prerequisites: I&LR 120 and 121 or equivalent.
Staff.
Introduces students to the basic issues involved in the sociological analysis of organizations. It traces organizational theory from Max Weber to the most recent research. Among the topics to be discussed are internal structure of organizations, communication in organizations, decentralization, organizational change, organizational technology, and organizational environment.

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 work motivation and on research approaches and results as these apply to individuals and groups in formal organizations. Readings are predominantly from the field of organized 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. Gruenfeld.
This course considers several related theories of personality relevant to an understanding of behavior and experience in organizations. The emphasis is on comparative systems of work cultures and corresponding expectations. A unit on the assessment of personality and a strategy for verification of theories of personality are presented to highlight research findings relevant to motivation, leadership styles, conflict, and stress in organizations.

373 Organizational Behavior Simulations Spring. 1 week. 1 credit. Prerequisite: I&LR 120 and 121 or equivalent.
R. Stern.
Basic principles of organizational behavior are studied through readings and participation in two simulation games. The first game, The Organizational Game: Design, Change, and Development, by Miles and Randolph, simulates traditional organization, while the second, The Fuzzy Game, by Paton and Lockett, simulates a cooperative. Organizational design, decision making, and conflict are the central topics of discussion. The contrasting bases of power in the two organizations permits the student to study the assumption underlying organization structure and process.

420 Group Processes Fall. 4 credits.
L. Gruenfeld.
Several conceptual and methodological approaches are applied to the observation of personality in group settings. 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.

422 Groups in Work Organizations Fall. 4 credits. Enrollment limited. Prerequisite: permission of instructor.
This is an applied social psychology course that emphasizes the building, maintenance, and renewal of purposive groups working in formal organizations. The course deals with models and variables that interact with group cohesion and performance. Structural, environmental, task, motivational, and interpersonal variables are considered. This is not intended as a sensitivity training laboratory; the course work is substantive and involves observation and analysis of live work groups in the field.

423 Evaluation of Social Action Programs Fall. 3 credits.
H. Trice.
A consideration of the principles and strategies involved in evaluation research; experimental research designs, pseudoevaluation, adaptations of cost benefits and cost efficiency to determine the extent to which intervention programs in fields such as training and therapy accomplish their goals. The adaptation of these strategies to large social contexts such as child guidance clinics, mental health clinics, and programs in the poverty areas such as Head Start is considered. Includes fieldwork and emphasizes assessment of program implementation.

424 Study of Public Sector Bureaucracy Spring. 3 credits. Prerequisite: permission of instructor.
S. Bacharach.
Field research in public sector organizations such as a school bureaucracy or a social welfare bureaucracy. Students conduct a major study into which they integrate themes from organizational theory. Theoretical issues 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, sabotage, and the influence on the environments in which it occurs are emphasized.

426 Theories of Industrial Society Fall. 4 credits.
Prerequisite: I&LR 120 and permission of instructor.
S. Bacharach.
Concentrates primarily on the works of Weber and Marx and will consist of readings in the original texts.

473 Ecological Psychology: Behavior-Setting Analysis within the Organizational Context Fall. 3 credits.
The origins, methods, and central concerns of ecological psychology. Ecological psychology is one
of the areas of specialization in psychology that has developed a theoretical framework and research technique for the study of behavior in everyday environments. Methods used to develop observation records as well as techniques used to divide the behavior stream into structural units will be examined. The primary focus of the course will be the more recent concerns of ecological psychology, namely, the study of theories and organizational behavior settings. Assigned reading will provide an overview of the theory of behavior settings, the methods used to identify and describe settings, as well as practical applications used in the field of organizational psychology. Behavior-setting theory will be used as a point of departure in examining selected topics in organizational psychology. These include person-environment fit in the work setting, the impact of organizational size on social climate, work-life quality and job enrichment programs, and overload stress and staff "burn-out" in service settings.

475 Organizational and Political Behavior In School Districts Fall. 4 credits. Enrollment limited. Prerequisite: permission of instructor. S. Bacharach.
This course is intended to provide students with research experience through the study of the administrative and governance processes in school districts. The students will be required to work with school board members, school district personnel, and school superintendents to investigate the following areas: (a) structure and process of decision making in urban and rural school districts, (b) organizational conflict as reflected in school board meetings, (c) the variations in, and effect of, leadership style, as evidenced by different superintendents' advisory techniques, (d) the collective bargaining process as reflected in both contracts and in the implementation of the Taylor Law on the structure and process of decision making in school districts, and (f) the effects of administrative law on conflict in school districts. Students will be responsible for the collection of data and the presentation of a final report of their project.

476 Unions and Public Policy in School Districts Spring. 4 credits. Enrollment limited. Prerequisite: permission of instructor. S. Bacharach.
A continuation of I&LR 475, but 475 is not a prerequisite. This course is strictly a research field seminar. Students will be required to work with school district unions and union personnel while investigating the following areas: (a) labor contracts with school districts, (b) relations between teachers' unions, school boards, and superintendents, (c) personnel union's involvement with school district policies, and (d) the collective bargaining process as reflected in both contracts and in the implementation of the Taylor Law on the structure and process of decision making in school districts. The emphasis will be on the implementation of union policies in the classroom environment, the effect of the Taylor Law on the structure and process of decision making in school districts, and 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.

478 Applied Topics in Organizational Behavior Fall. 4 credits. Prerequisite: two courses in organizational behavior beyond the 100 level. L. Williams.
Reading and classroom discussion will be devoted to each of these topics. The topics are industrial and work sociology, with a particular focus on retirement; technology and the office; and gender and personality as organizational variables. Readings will be primarily from journal articles. Students will have a research task for each topic.

495 Honors Program Fall and spring (yearlong course). 3 credits each term. For description see p. 322.

497-498 Internship Fall or spring. 3 and 6 credits. For description see p. 322.

499 Directed Studies For description see p. 322.

520 Micro Organizational Behavior and Analysis Fall. 3 credits. L. Williams.
Survey of concepts, theories, and research from the fields of organizational and social psychology as well as motivation to lead and to follow will be discussed. The implications for leadership training, organization development, and action research are explored.

628 Cross-Cultural Studies of Organizational Behavior Fall or spring. 3 credits. Designed for graduate students interested in research and sociopsychological theory at the workplace. Undergraduates with permission of instructor. L. Gruenfeld.
How organizational behavior is affected by age (generational), sex, social class, and cultural differences? What are the causes and patterns, both subjective and objective, for age and other kinds of discrimination?

670 Sociological Study of Power Fall 3 credits.
S. Bacharach.
The empirical, conceptual, and theoretical issues involved in the study of power. Power is analyzed within the context of an interrelated model, and thus, while the major emphasis of this course is on the examination of power dispersion in organizations and communities, relevant social-sociological theory to questions of power. A primary concern is the integration of organizational and community theory.
328 Industrial and Labor Relations

676 Systems of Labor Participation in Management Fall. 4 credits. Limited to 25 students. Prerequisites: senior standing and permission of instructor. T. Hammer, R. Stern. Examines the theory and practice of labor participation in systems ranging from informal shop-level participation to self-management. Special emphasis is placed on socio-technical systems of job design. Attention is also given to projects involving the restructuring of work and efforts to improve the quality of working life.

677 Seminar in Field Research Spring. 4 credits. Enrollment limited. Prerequisite: permission of instructor. H. Trice. Recent research efforts are 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.

722 Theories of Organizational Behavior Fall. 3 credits.

A proseminar of current topics in organizational psychology. Discussions based on current research and theoretical innovations in the field.

723 Behavioral Research Theory, Strategy, and Methods I Fall. 4 credits. Designed to meet the needs of M.S. and Ph.D. candidates majoring in organizational behavior, but other graduate students may enroll. L. Williams. Materials studied in ILR 723 and 724 includes (1) theoretical, conceptual, and ethical questions; (2) survey research and attitude-scaling procedures; (3) laboratory research methods; (4) participant observation and interview methods; (5) use of documents and qualitative data analysis. Provides students with important philosophical background for doing research and exposes them to a well-balanced, interdisciplinary set of quantitative and qualitative research tools.

724 Behavioral Research Theory, Strategy, and Methods II Spring. Variable credit. Prerequisite: permission of instructor. Must be taken in sequence with ILR 723, except by petition. Designed to meet the needs of M.S. and Ph.D. candidates majoring in organizational behavior, but other graduate students may enroll. T. M. Williams.

The purpose is to teach graduate students how to treat and interpret research data after they have been collected. The course will cover (a) data analysis and interpretation through the study of psychometric theory, (b) traditional problems encountered in the assessment of human and organizational characteristics, (c) the use of different methods of data analysis, and (d) an examination of the limitations imposed on data analysis and interpretation by traditional measures.

725 Analysis of Published Research in Organizational Behavior Fall. 3 credits. Prerequisites: ILR 520–521 and one year of statistics. Staff.

An advanced research methods course that critically examines published research papers in the field of organizational behavior in terms of research design and method as well as theory.

726 Organizational Behavior III Spring. 3 credits. Prerequisite: ILR 520–521 or equivalent.

Staff.

A team-taught comparison of different disciplinary approaches to organizational analysis and models.

Emphasis is on integrating different disciplinary approaches to selected organizational phenomena such as change and innovation, decision making and information processing, reward structures, or conflict resolution.

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, and 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. Prerequisite: ILR 520–521. T. Hammer.

Two independent but sequence-connected minicourses.

(1) Theories of Work Motivation - 7 weeks. 2 credits.

This course will provide an overview of basic concepts of human motivation with implications for theory and research. Intended to provide a basic understanding of theoretical issues involved in work motivation and knowledge of basic research approaches applicable to individuals and groups in formal organizations.

(2) Seminar on Job Design - 7 weeks. 2 credits.

In the seminar, the theories underlying the design of jobs are examined together with empirical research. The course will cover early theories and research in job design from scientific management and later developments, with particular attention paid to the recent emphasis on job design through job enlargement and job enrichment.

798 Internship

For description see p. 323.

799 Directed Studies

For description see p. 323.

920 Organizational Behavior Workshop Fall. 2 credits. Limited to M.S. and Ph.D. candidates in the department. Staff grades only. S. Bacharach.

This workshop is designed to provide a forum for the presentation of current research undertaken by faculty members and graduate students in the Department of Organizational Behavior and by invited guests. All M.S. and Ph.D. candidates in the department who are at work on their theses are strongly urged to enroll. Each student in the course will be expected to make at least one presentation during the year, focusing on the formulation, design, execution, and results of that student's thesis research.

Personnel and Human Resource Studies

Personnel and Human Resource Studies


The 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 legal issues involving human resource specialists will be discussed in the seminar and developed into a term paper.

366 Women at Work Fall or spring. Variable 3 or 4 credits. Prerequisite: ILR 260 or equivalent. F. Miller.

Various aspects of female occupational roles in twentieth-century United States. Historical, social, and legal factors that influence women's choice of careers, work socialization and training, and subsequent labor-market experience are considered. Working women's entry-level jobs, opportunities for advancement, and income are compared to men's.


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.

469 Immigration and the American Labor Force Spring. 3 credits. Prerequisite: ILR 360 or equivalent. V. Briggs.

The role that immigration has played 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, the topic of illegal immigration and its effects are also examined. Public policy aspects of the issue are explored in depth.

495 Honors Program Fall and spring (yearlong course). 3 credits each term.

For description see p. 322.

497-498 Internship Fall or spring. 3 and 6 credits.

For description see p. 322.

499 Directed Studies For description see p. 322.

560 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 attitudes, motivation, human resource planning, recruitment and selection, training, management development, organization development, and compensation. Emphasis is on the application of theory and research to the solution of personnel problems.

653 Personnel and Human Resource Management in the Eighties Fall. 3 credits. Limited to 25 students. Prerequisite: seniors and graduate students with 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. Twelve 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 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 advanced assignments suggested by the guest seminar leader.

654 Career Planning and Development Fall. 3 credits. Prerequisite: I&LR 260 or equivalent. V. Huber.

Consideration of career planning and development from both the organizational and individual perspectives.

661 Applied Personnel and Organizational Development Practice Spring. 3 credits. Prerequisite: undergraduates, I&LR 260; graduate students, I&LR 560 or equivalent. V. Huber.

Deals with personnel development technique and organizational development intervention methodology. Students examine and practice group techniques, feedback, and processing techniques, active listening, one-to-one counseling, behavior modeling, role playing, the case method, team building, survey-guided intervention, and other relevant methods. Techniques, topics, and issues. This course combines pertinent literature with the opportunity for hands-on practice in a workshop setting. Students have responsibility for developing and delivering scholarly papers that explore a specific method, technique, and/or critical issue. In addition, a final project requires a comprehensive proposal that describes an organizational development intervention.

662 Management Training Simulation: Public Policy Issues in Social Agencies Spring. 3 credits. Prerequisite: I&LR 260 or equivalent. W. Waszmu.

Techniques of simulation are applied to a vocational rehabilitation facility, a community hospital, and a hotel-banquet operation. Although much of the material relates to health services management, simulation as an approach to training managers has wider and growing importance to all types of organizations. Students are provided with realistic problem-solving situations involving boards of directors, community resources, public policy issues, state and federal agencies, labor unions, and changing economic conditions.

663 Job Matching: Job Search and Organizational Recruiting Spring. 3 credits. Prerequisites: undergraduates, I&LR 260; graduate students, I&LR 560; S. Pynes.

Research-oriented treatment of employment hiring practices from both the job-seeker and organizational perspectives. Topics include individual job search and choice, organizational recruiting strategies and practices, and methods used to predict on-the-job success (e.g., tests, interviews).

664 Seminar in Organizational Communication Spring. 3 credits. Prerequisite: permission of instructor. W. Frank.

Seminar centers on selected issues and relevant research involved in the study of communication with formal organizations. Organizational structure and design, patterns of information flow, and individual and group determinants of communication effectiveness will be important concerns.

665 Case Studies in Personnel Administration Spring. 3 credits. Open only to graduate students and seniors with at least three courses in various personnel subareas.

Staff. An analysis of personnel management activities and their impact on organizational objectives and administration. Cases, incidents, and field data derived from a variety of institutional settings provide a framework for examining and exploring the various roles played by personnel managers. Students with a special interest in personnel are encouraged to use this course as a "capstone" to their studies.

667 Managers and Managing Fall. 3 credits. Prerequisite: I&LR 260.

Staff. A review of the operations of business and industrial organizations, including an emphasis on classical approaches to management theory; appointment, identification of management potential, careers and succession processes; managerial and responsibility management practices; planning and direction, organization, communication, control, reward systems; management problems; emerging approaches and current issues in management. Particular emphasis is given to the responsibilities and practices of managers for effective employment of human resources in contemporary conditions.

668 Staffing: Employee Selection and Utilization Fall. 3 credits. Prerequisites: I&LR 260 or equivalent and one semester of statistics. Working knowledge of factor analysis, item analysis, regression analysis, and ANOVA.

J. Boudreau.

An analysis of the staffing process as applied to employing organizations. Topics examined include sources of personnel, methods used to assess individual differences, methods used to assess organizational job requirements, problems associated with person-job matching, career planning, employee separations, and the relationship between the staffing process and other organizational processes.

669 Administration of Compensation Fall or spring. 3 credits. Prerequisite: I&LR 260 or equivalent.


The development and administration of wage and salary programs. Major emphasis is given to the role of compensation in attracting, retaining, and motivating employees. Topics investigated include motivation theory, factors influencing compensation levels, job evaluation, forms of compensation, including incentive plans and fringe benefits, special issues of managerial compensation, and problems of compensation control.

691 Human Resource Planning Spring. 4 credits.

Prerequisites: I&LR 260 or equivalent and one course in statistics. L. Dyer, G. Milkovich.

The process of human resource planning as practiced by private and public employers. Included are topics such as forecasting human resource needs, programming, techniques to meet forecasted needs, and methods of controlling an organization's supply of human resources. The seminar is organized around a computer simulation game in which students make policy and program decisions for a fictional organization. Decisions are evaluated on the basis of their contributions to the organization's human resource and profit objectives.

693 Design and Administration of Training Programs Spring. 3 credits. Prerequisite: I&LR 260 or equivalent. W. Frank, V. Huber.

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.

696 Personnel Administration and Government Regulations Fall. 3 credits. Prerequisite: I&LR 260 or equivalent. R. Risley.

A survey and analysis of government regulations affecting personnel management in nongovernment organizations, examining the framework within which management must operate. Government agencies' methods of enforcement of such regulations and the firm's responsibilities for failure to comply with these legal requirements are considered.

760 Seminar in Personnel and Human Resource Management Fall or spring. 3 credits.

Staff. A "floating" seminar designed to give faculty and students an opportunity to pursue specific topics in detail, with an emphasis on theory and research. Topics vary from semester to semester. Interested students should consult current course announcements for details.

781 Human Resource Economics and Public Policy Spring. 3 credits. V. Briggs.

A review of contemporary labor-market trends and theories pertaining to labor-market intervention 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, and worker relocation will be examined. Comparison will also be made with European initiatives.

798 Internship For description see p. 323.

799 Directed Studies For description see p. 323.

Interdepartmental Courses 329
occupational mobility; (4) recruitment and socialization into occupational roles; (5) the process of professionalization, and (6) comparison of personnel occupations with the caretaker and organizational patterns of other occupations. A major sociological theme is the relationship between occupational structure and workplace structure.

346 Economics of Collective Bargaining Fall or spring. 3 credits. Economic aspects of the negotiation, terms, and effects of union-management agreements at the individual firm, industry regional, and national levels. Topics examined include forces influencing contract demands and terms, employer adaptation to higher wages and benefits, interindustry differences in competitiveness, firm size, and markets; regional location of industry, international competition, government regulations, labor supply, inflation, recession, and unemployment.

350 History of Industrial Relations in the United States Fall or spring. 3 credits. This review of the history of industrial relations in the United States emphasizes developments in the twentieth century. The course concentrates on the American worker, both union and nonunion; labor movements; and the environmental forces that have shaped industrial relations in the United States. Readings are selected from scholarly accounts and original sources.

351 Collective Bargaining Fall or spring. 3 credits. A comprehensive study of collective bargaining, the negotiation and scope of contracts, the day-to-day administration of contracts, the major substantive issues in bargaining, including their implication for public policy, and the problem of dealing with industrial conflict.

352 Labor Relations Law and Legislation Fall or spring. 3 credits. A survey of the law governing labor relations. The legal framework in which the collective bargaining relationship is established and 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 discussed is the application of the legal system and method to and legal and constitutional problems of governmental regulation of industrial and labor relations.

353 Statistics (Statistical Reasoning) Fall or spring. 3 credits. An introduction to the basic concepts of statistics: description of frequency distribution (averages, dispersion, and simple correlation) and introduction to statistical inference. Prerequisite to certain specialized courses on applications of statistics offered in various departments.

354 Economics of Wages and Employment Fall or spring. 3 credits. Prerequisites: Economics 101–102 or equivalent. An introduction to the characteristics of the labor market and to analysis of wage and employment problems. Among topics studied are the composition of the labor force, job-seeking and employment practices, methods of wage determinations, 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 and examined as a formal and informal group member. Within this area, particular emphasis is placed on leadership, problem solving, and conflict resolution.

357 Labor Education II 3 credits. An advanced course in the organization and administration of labor education programs. The course is divided into two parts. Part I: organization and administration of labor education programs, how to work with the union hierarchy, planning the "first" program, developing an education committee, budgeting and financing programs, managing time and dealing with job stresses; recruiting and publicizing programs; basic interpersonal relations; handling grievances in the classroom, writing reports and memos; organizing records and files; evaluating your work. Part II: development of course outlines and how to choose and use the appropriate methods and techniques for the classroom, how to develop a subject-matter specialty, research materials needed, and teach the subject. Practical skills will be incorporated into the classroom work.

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. A consideration of the origin and development of employer, union, and joint programs, and a critical examination of the financing, administration, and general 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 antitrust 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 to 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 the 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 basis for development of a number of specific topics 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 prerequisites 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, unit determination, representation procedures, and the strikes against government.

689 Labor Education  
Fall or spring. 3 credits.  
Prerequisite: permission of instructor.  
An examination will be made of labor education, its origin, development, scope, form, functions, curricula, goals, issues, and the role of universities, unions, and other organizations. Attention will be devoted to various practical aspects associated with the administration of programs and labor education as an occupation. The course will involve students in field activities in connection with current Extension Division programs.

Faculty Roster

Aranson, Robert L., Ph.D., Princeton U. Prof., Labor Economics
Bacharach, Samuel, Ph.D., U. of Wisconsin. Prof., Organizational Behavior
Blumen, Isadore, Ph.D., U. of North Carolina. Prof., Economic and Social Statistics
Boudreau, John W., Purdue U. Asst. Prof., Personnel and Human Resource Studies
Boyce, 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
Crabbe, Charles, Ph.D., Michigan State U. Prof., Extension
Cullen, Donald E., Ph.D., Cornell U. Prof., Collective Bargaining, Labor Law, and Labor History
Ehrenberg, Ronald, Ph.D., Northwestern U. Prof., Labor Economics
Farkas, James A., Ph.D., U. of Wisconsin. Prof., Collective Bargaining, Labor Law, and Labor History
Galenson, Walter, Ph.D., Columbia U. Jacob Gould Schurman Professor, Labor Economics/International and Comparative Labor Relations
Gray, Lois S., Ph.D., Columbia U. Prof., Extension
Gruenfeld, Leopold W., Ph.D., Purdue U. Prof., Organizational Behavior
Hammer, Irv E., Ph.D., U. of Maryland. Assoc. Prof., Organizational Behavior
Hanslowe, Kurt, J.D., Harvard U. Prof., Collective Bargaining, Labor Law, and Labor History
Hutchens, Robert M., Ph.D., U. of Wisconsin. Assoc. Prof., Labor Economics
Kaufman, Jacob J., Ph.D., Columbia U. Prof., Extension
Korman, A. Gerd, Ph.D., U. of Wisconsin. Prof., Collective Bargaining, Labor Law, and Labor History
Lipsky, David B., Ph.D., Massachusetts Inst. of Technology. Prof., Collective Bargaining, Labor Law, and Labor History
McCarthy, Philip J., Ph.D., Princeton U. Prof., Economic and Social Statistics
Mikovich, George, Ph.D., U. of Minnesota. Prof., Personnel and Human Resource Studies
Miller, Frank B., Ph.D., Cornell U. Prof., Personnel and Human Resource Studies
Nash, Abraham, Ph.D., New York U. Prof., Extension
Pennings, Charles M., Ph.D., Stanford U. Prof., Collective Bargaining, Labor Law, and Labor History
Pisley, Robert F., Ph.D., Cornell U. Prof., Personnel and Human Resource Studies/Extension
Ross, Philip, Ph.D., Brown U. Prof., Collective Bargaining, Labor Law, and Labor History
Salvatore, Nicholas, Ph.D., U. of California at Berkeley. Asst. Prof., Collective Bargaining, Labor Law, and Labor History
Smith, Robert S., Ph.D., Stanford U. Prof., Labor Economics
Starr, Robert N., Ph.D., Vanderbilt U. Assoc. Prof., Organizational Behavior
Trice, Harrison M., Ph.D., U. of Wisconsin. Prof., Organizational Behavior
Vellamann, Paul F., Ph.D., Princeton U. Assoc. Prof., Economic and Social Statistics
Whyte, William F., Ph.D., U. of Chicago. Prof., Organizational Behavior/International and Comparative Labor Relations
Williams, Lawrence K., Ph.D., U. of Michigan. Prof., Organizational Behavior
Windmuller, John W., 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  
Robert B. Kent, associate dean for academic affairs and professor of law  
Albert C. Neimeth, associate dean and director of alumni affairs and placement  
Kristine R. Krelick, associate law librarian  
John Lee Smith, dean of students  
Anne Lukingbeal, assistant dean and director of admissions and financial aid  
Frances M. Bulis, 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 limited number of students will be admitted to a program of study leading to the degree of Doctor of Law "with specialization in international affairs."

There are combined graduate degree programs with the Graduate School of Business and Public Administration, the College of Arts and Sciences, the Department of City and Regional Planning, and the School of Industrial and Labor Relations, 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 L.L.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 |
| 508 | Practice Training I |
| 509 | Practice Training II |
| 512 | Property |
| 515 | Torts |

### Upperclass Courses

| 600 | Administrative Law |
| 604 | Advanced Civil Procedure |
| 608 | Antitrust Law |
| 610 | Business Associations I |
| 611 | Business Associations II |
| 614 | Business Torts |
| 618 | Commercial Law |
| 620 | Comparative Law |
| 622 | Conflict of Laws |
| 624 | Criminal Procedure: From Indictment to Sentence |
| 626 | Criminal Procedure: Investigation |
| 628 | Debtor-Creditor Law |
| 630 | Employment Discrimination |
| 632 | Enterprise Organization |
| 634 | Environmental Law |
| 635 | Estate and Gift Taxation |
| 638 | European Economic Community |
| 640 | Evidence |
| 642 | Family Law |
| 644 | Federal Courts |
| 646 | Federal Income Taxation |
| 648 | Intellectual and Industrial Property |
| 650 | International Law |
| 652 | International Taxation |
| 654 | International Trade Law |
| 656 | Interviewing, Counseling, and Fact Investigation |
| 658 | Labor Law |
| 660 | Land-Use Planning |
| 664 | Law Practice Dynamics |
| 666 | Law, Society, and Morality |
| 668 | Lawyer as a Negotiator |
| 670 | Lawyers and Clients |
| 672 | Legal History |
| 674 | Local Government |
| 676 | Process of Property Transmission |
| 678 | Professional Responsibility |
| 680 | Real Estate Transfer and Finance |
| 682 | Securities Regulation |
| 684 | Soviet Law |
| 688 | Taxation of Corporations and Shareholders |
| 690 | Taxation of Partnership Income |
| 692 | Trial Advocacy |
| 694 | Trusts and Estates I |

### Problem Courses and Seminars

| 700 | American Legal Theory |
| 704 | Children's Rights |
| 706 | Computer Applications in Law Practice and Legal Education |
| 710 | Copyright, Trademark, and Patent Law |
| 714 | Corporate Practice |
| 718 | Equal Protection Seminar |
| 722 | Ethics of Corporate Practice |
| 726 | Freedom of Expression |
| 732 | International Business Transactions |
| 736 | Labor Arbitration Seminar |
| 740 | Law and Economics Seminar |
| 744 | Law and Medicine |
| 746 | Lawyers and Moral Responsibility |
| 752 | Legal Aid I |
| 753 | Legal Aid II |
| 756 | Multinational Enterprise |
| 762 | Official Liability |
| 766 | Problems in Legislation |
| 770 | Products Liability Seminar |
| 778 | Remedies |
| 782 | Selected Problems in Commercial Law |
| 788 | Theories in Law, Science, and Ethics |

### Faculty Roster

Aman, Alfred C., Jr., J. D., U. of Chicago. Prof.  
Barceló, John J. III, S.J.D., Harvard U. Prof.  
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.  
Gunn, Alan, J.D., Cornell U. Prof.  
Hammond, Jane L., J.D., Villanova U. Prof.  
Hanslowe, Kurt L., J.D., Harvard U. Prof.  
Hay, George A., Ph.D., Northwestern U. Prof., Law/Economics  
Henn, Harry G., J.S.D., New York U. Edward Cornell Professor of Law  
Hillman, Robert A., J.D., Cornell U. Prof.  
Johnson, Sherrill 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.  

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**Note:** The above text includes the section for **First-Year Courses** and **Upperclass Courses**, along with a brief overview of **Problem Courses and Seminars** and **Faculty Roster**. The table format is maintained for clarity and organization. The remaining text appears to be a continuation of previous paragraphs, possibly discussing specific courses or faculty members, but is not fully transcribed here due to the nature of the document.
Palmer, Larry L., LL.B., Yale U. Prof.
Roberts, Ernest F., LL.B., Boston Coll. Edwin H. Woodruff Professor of Law
Rossi, Faust F., J.D., Cornell U. Samuel S. Leibowitz Professor of Trial Techniques
Simson, Gary J., J.D., Yale U. Prof.
Thoron, Gray, LL.B., Harvard U. Prof.
Wolfram, Charles W., LL.B., U. of Texas. Prof.
Younger, Judith T., J.D., New York U. Prof.
Zacharias, Fred C., LL.M., Georgetown U. Law Center. Asst. Prof.
Division of Nutritional Sciences

Administration

Malden C. Nesheim, director
Marjorie M. Devine, associate director for academic affairs
Lemuel D. Wright, graduate faculty representative.
Field of Nutrition

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. Their work covers undergraduate and graduate teaching, nutrition research, and public education.

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 library, and in Martha Van Rensselaer Hall the division has set up the Learning Resources Center, which many undergraduates use for individual study and small group discussions. The Learning Resources Center contains class materials, audiovisual aids, and supplementary books and periodicals for independent study and special projects in nutrition.

The Major

The B.S. degree program with a major in nutritional sciences (NS) offers five major options, but all of them give students a thorough foundation in the basic sciences, the field of nutrition, and communication skills. Graduates are qualified for a variety of entry-level positions in laboratory research, consumer affairs, nutrition education, and clinical and public-health services. All students are well prepared to pursue dietetic training or advanced study in fields such as nutrition, food science, biomedical sciences, and public policy.

Most undergraduates who major in nutritional sciences enroll in the College of Human Ecology. Students in the College of Agriculture and Life Sciences can also pursue a nutritional sciences option through the General Studies Program, and students in the College of Arts and Sciences can take a nutrition concentration as an independent option in the Division of Biological Sciences. Nutrition courses can be used to meet graduation requirements in all three colleges.

Academic Advising

Every student majoring in nutritional sciences is assigned a faculty adviser from the division. An effort is made to match interests, and students may change advisers at any time if their goals and interests change. Regular student-adviser conferences are required at least twice a year. The adviser not only helps students select courses but can often suggest opportunities for individual study or experience outside the classroom.

The specific course requirements for graduation and for each major option are listed in the Human Ecology Student Guide, available on request. Questions about undergraduate study should be addressed to Marjorie Devine, associate director for academic affairs.

The Core Curriculum

In their freshman and sophomore years, all undergraduates majoring in nutritional sciences follow a core curriculum that builds the foundation for any aspect of advanced study in nutrition. The core curriculum includes courses in food and nutrition, laboratory skills, humanities and communications, introductory social sciences, and basic sciences.

There is some choice of science courses, but all nutrition students need a good background in general and organic chemistry, biochemistry, microbiology, physiology, and mathematics.

Transfer students need to pay particular attention to the core curriculum and may need to take an extra semester to fulfill all of the basic requirements, especially in the sciences. The course NS 300, Special Studies for Undergraduates, which allows students to take "pieces" of courses, helps transfer students integrate their previous training into the requirements for the nutritional sciences major without duplicating 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 opportunities 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 biomedical 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, 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
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 Peckenaugh, the division's field-study coordinator.

Independent Study

Independent study courses (NS 400, 401, 402) can be used to obtain credit for more diverse or intensive experience than the classroom can offer, whether this involves laboratory work, library research, or field study. Any student interested in independent study should obtain the sponsorship of a faculty adviser and the approval of Dr. Devine or consider applying to the honors program.

Honors Program

The honors program, leading to a B.S. degree with honors in nutritional sciences, gives official recognition to students who have demonstrated excellence in their academic work and their capacity for independent study.

In addition to fulfilling the requirements for a major option in nutritional sciences, students in the honors program take courses on designing and evaluating research, complete an original piece of research, and prepare an honors thesis. The honors project may be laboratory or field research or deal with policy and program development.

For more information, students should contact Mary A. Morrison, honors chairperson, N-205A 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 several special interest courses (NS 222, Maternal and Child Nutrition, NS 325, Sociocultural Aspects of Food and Nutrition, NS 346, Consumer Food Issues, 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 larger entity of the state university is 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.

Nutritional Sciences Courses

Nutritional Sciences Courses 335

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 and permission of the instructor), spring, a one-semester college biology course or permission of the instructor. S-U grades optional. Cost of handouts and pamphlets, $3.

Fall: M W FW 11:15. Four discs scheduled in place of some texts. Evening prelims: fall, Sept. 27, Oct. 25, Nov. 22; spring, to be arranged. M. Devine.

An introduction to the field of human nutrition and food. Includes study of human nutritional needs; problems encountered in providing food to meet nutritional needs; relationships among physiological needs, sociocultural systems, food, and the significance of these relationships to health. Discussion of current issues, such as vegetationism, weight control, and dietary goals, is included.

146 Introductory Foods Fall and spring. 3 credits. Each section limited to 16 students. Prerequisite: NS 115 or concurrent registration. Permission of instructor during course registration required. Permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall. Cost of handouts, $2.


Criteria for evaluating the practice of the science of food and nutrition. Laboratory includes an introduction to the physiochemical properties of foods and the relationship of these properties to food quality—especially color, flavor, and texture. Laboratories introduce the experimental study of food and illustrate the function of ingredients and effects of treatment on food quality.


Involves a study of the nutritional requirements in pregnancy, lactation, and growth through adolescence. Topics include the relationship between maternal diet and pregnancy outcome, analysis of different methods of infant feeding, and nutritional status of pregnant women, children, and adolescents in the United States and in developing countries.

246 Introduction to Physiochemical Aspects of Food Fall or spring. 4 credits. Each section limited to 15 students. Prerequisites: a college course in organic chemistry or biochemistry. NS 146, and permission of instructor during course registration. Permission-of-instructor forms must be obtained from, and returned to, 335 Martha Van Rensselaer Hall. S-U grades optional.


A study of (a) the colloidal properties of solutions; (b) colloidal systems—sols, gels, foams, and emulsions; (c) and physical and chemical properties of the major groups of foods, the effect of basic methods of food preparation and preservation on these properties, and their relationship to food quality.

301 Nutritional Aspects of Raw and Processed Foods (also Food Science 301) Spring 3 credits Prerequisite: NS 115 and organic chemistry or physics of the instructor.


An evaluation of the nutritional qualities of raw foods with emphasis on changes that occur during processing and storage. Special emphasis on chemical and physical methods of nutritional evaluations of foods, factors that may affect nutrient loss, descriptions of the composition and nutritional role of selected commodities, food fortification, food additives, fabricated foods, fast foods, and minimally processed foods.

302 Field Study with Cooperative Extension Fall. 2 credits. Limited to 10 juniors and seniors. Prerequisites: NS 115, 146, and permission of instructor. S-U grades optional. Not offered fall 1983; next offered fall 1984. Students expecting to enroll in NS 302 in 1984 should elect NS 305 in fall 1983 to prevent scheduling conflict.

F 12:20--4, field trips to nearby counties arranged. R. Klippstein.

Upperclass students, working as a team, select a current nutrition issue and prepare and present a program to a regularly scheduled cooperative extension audience. The course stresses ways to present food and nutrition information to various types of lay audiences. Methods used may include small group discussion, food demonstration, illustrated lecture, and/or 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.

325 Sociocultural Aspects of Food and Nutrition Fall. 3 credits. Limited to juniors and seniors. Prerequisites: NS 115 and a college course in anthropology or sociology.

M W F 2:30. D. Sanjur. The course offers a cross-cultural perspective for understanding the environmental and sociocultural parameters affecting the development of food consumption patterns. Emphasis is on theories on formation of food habits, dietary methodologies, especially color, flavor, and texture. Laboratories introduce the experimental study of food and illustrate the function of ingredients and effects of treatment on food quality.
331 Physiological and Biochemical Bases of Human Nutrition 3 credits. Prerequisites: Biological Sciences 100 or 331 and NS 115 or equivalent. S-U grades optional.
MWF 10:10. M. C. Nesheim, 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 and 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). Lec., M 12:20, labs, M 1:25–4 or T 1:25–4. M. Stipanuk. 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.

346 Consumer Food Issues Fall. 2 credits. Limited to 30 juniors and seniors. Prerequisites: NS 115 and 148 or permission of instructor. S-U grades optional.
TR 12:20. C. Bisogni. 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.

347 Human Growth and Development: Biological and Social Psychological Considerations (also Human Development and Family Studies 347) Spring. 3 credits. Prerequisites: Biological Sciences 101 or 109 or equivalent. Human Development and Family Studies 115 or Psychology 101 and NS 115 or equivalent.
MWF 10:10 and F 8. V. Utermohlen.

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.
MWF 11:15. D. Levitsky. A survey of the scientific literature on the role of brain and body biochemical changes as determinants of human behavior. The topics covered include action and effects of psychopharmacologic agents, biochemical determinants of mental retardation, biochemical theories of psychosis, and effects of nutrition on behavior.

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 and 122, or 361 or permission of instructor. S-U grades optional. Estimated cost, $5. TR 10:10–12:05. R. Holmes. Application of management principles to foodservice operations, including organization, production, distribution, and service quality of 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 optional. T 2:30. M. Morrison, coordinator. Research design. Analysis of research papers on selected topics.

400–401–402–403 Special Studies for Undergraduates Fall or spring. Credits to be arranged. S-U grades optional.

Division faculty.

For advanced independent study by an individual student or for study on an experimental basis with a group of students in a field of nutritional sciences not otherwise provided for through course work in the division or elsewhere at the University. Students prepare a description of the study they want to undertake, on forms to be signed by the instructor directing the study and the associate director of academic affairs. The forms, available from the Counseling Office, are filed at course registration or within the change-of-registration period. To ensure review before the close of the course registration or change-of-registration period, students should submit the special studies form to the 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 Fall, spring, or summer. 2–6 credits. S-U grades optional. Prerequisites: junior, senior, or graduate standing; 9 hours of coursework in DNS, previous or concurrent registration in Human Ecology 100 or equivalent experience and permission of instructor. Obtain application/package from Counseling Office (335 Martha Van Rensselaer Hall). Hours in placement arranged individually; biweekly seminar to be announced. N. Peckenaugh. 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 of experiences among students and for integration of theory and practice. Students may be required to provide their own transportation to placements.

441 Nutrition and Disease Fall. 4 credits. Prerequisites: NS 331 and a human physiology course. S-U grades optional. Cost of handouts and pamphlets, $5.
MWF 10:10 and F 8. V. Utermohlen. Study of the physiologic and metabolic anomalies in chronic and acute disease and the principles of nutritional therapy and prevention. The topics covered are diabetes mellitus, starvation, obesity, nutritional assessment, nutritional pharmacology, severe injury, infectious disease, 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 429, or grade in course 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. Cost of handouts, pamphlets, and brochures, $5.

Development of skills in formulation and analysis of therapeutically dietary regimes. 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.
LEC-discs, M 11:15; fieldwork lab, W 2:30–4:30. Staff. Study of human nutrition and health problems from a community perspective; programs and policies related to nutrition at local, state, and national levels; and approaches and techniques of effective application and dissemination of nutrition knowledge in communities.

446 Physiochemical Aspects of Food Fall. 3 credits. Prerequisites: NS 246 and a college course in biochemistry, which may be taken concurrently. S-U grades optional.
MWF 9:05. G. Armbruster. The relation of food quality to (a) rheological properties of foods 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 Physiochemical Aspects of Food—Laboratory Fall. 1 credit. Limited to 16 students. Prerequisites: NS 446 or concurrent registration. S-U grades optional.
T 12:5–4:25. G. Armbruster. 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 Physiochemical Aspects of Food—Laboratory Fall. 1 credit. Limited to 16 students. Prerequisites: NS 446 or concurrent registration. S-U grades optional.
R 12:5–4:25. G. Armbruster. Laboratory experiments designed to illustrate (a) the physiochemical 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.

456 Experimental Foods Methods Spring. 3 credits. Limited to 16 students. Prerequisites: NS 446 and 448. Recommended course in statistics.

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.
MWF 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.
260 Lipids Fall. 2 credits. 
T R 11:15. A. Bensadoun
Advanced course on biochemical, metabolic, and nutritional aspects of lipids. Emphasis is on critical analysis of current topics of lipid methodology, lipid absorption, lipoprotein secretion, structure, and catabolism; mechanisms of hormonal regulation of lipid and lipoprotein metabolism; and cholesterol metabolism and atherosclerosis.

604 The Vitamins Fall. 2 credits. 
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. T R 11:15. C. Wilkinson, C. Campbell, A. Aronson, and others.

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. 
Lec., T 1:25. Lab., R 1, 25-4. J. Haas
A laboratory course to train students in methods and techniques used to assess the physical growth and development of growing children. The methods expected to be 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 the instructor. S-U grades optional. Offered alternate years. 
M W F 11:15. D. Levitsky.
This course is a multidisciplinary discussion of the causes, effects, and management of human obesity. Topics include the biopsychology of eating behavior, genetics of obesity, role of activity and energy metabolism, psychosocial determinants of obesity, anorexia nervosa, therapy and its effectiveness, and social discrimination.

614 Topics in Maternal and Child Nutrition Fall. 3 credits. Prerequisites: NS 331, 222 or 347, Biological Sciences 311, and permission of the 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 7:30–9:25 p.m. N. Mondy.
Critical review of selected topics in the current literature. Emphasis on experimental data and basic scientific principles underlying modern theory and practice relative to food quality. Training in oral and written presentations of scientific reports.

617 Teaching Seminar Fall and spring. 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. M. Devine, N. Yaghian.
A series of workshops focusing on development of teaching skills for guiding classroom learning in lecture, discussion, and laboratory settings. Preparation of content, presentation, and interaction techniques and evaluative methods are emphasized in relation to the student's specific teaching assignment. Videotape simulations provide opportunity for practice and analysis of teaching behaviors.

618 Teaching Experience Fall or spring. No credit. Limited to division graduate students and students who have permission of the 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 lecturers.
Lectures on current research in nutrition.

625 Seminar in Food Habits Research Fall. 3 credits. Limited to 12 graduate students. Prerequisite: statistics or research design course. Offered alternate years. Not offered 1963–64.
Emphasizes a critical review of the literature and development of a research proposal using sociological theories and techniques as applied to nutritional data.

626 Special Topics in Food Spring. 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 Spring. 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. Mondy.
Current research related to food production and processing as well as toxicants in the food chain will be reviewed. May be repeated for credit with permission of the instructor.

630–633 Advanced Nutrition Laboratory Spring 1–5 credits. Limited to 12 students. 
Study of 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.
338 Nutritional Sciences

630 Anthropometric Assessment 1 credit
Prerequisites: NS 331 or equivalent and permission of instructor.
T R 2:15–5:15. J. Haas.
Study of methods and procedures for anthropometric, radiographic, and energetic assessment of children and adults in clinical, research, and survey settings.

631 Dietary Assessment 1 credit
Prerequisites: statistics and NS 331 or equivalent, and permission of instructor.
Study of methods and techniques for assessing dietary intakes at the individual and household levels.

632 Clinical Assessment 1 credit
Prerequisites: NS 630, 631, 441, Biological Sciences 330 or 331, either 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 Weekly 9–14; interested students must enroll with the instructor during the first 2 weeks of the term. 2 credits.
Prerequisites: NS 331, Biological Sciences 330 or 331, either NS 332 or Biological Sciences 430, or permission of instructor.
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 634) Spring. 2 credits.
Prerequisites: organic chemistry 253 or 357-358 and Biological Sciences 331 or 330, or their equivalents in biochemistry. Offered alternate years.
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 359 or 360 and either Biological Sciences 330 or 331 or permission of instructor.
T R 9:05. W. J. Warford.
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 and staff.
The elements and dynamics of energy metabolism in higher animals are systematically developed through biochemical characterizations of the metabolic components and structure of major tissues and organs, stressing correlations with physiologic functions. Metabolic control energy metabolism within individual tissues and coordinate these processes in the intact animal are analyzed in the contexts of selected physiologic and pathologic stresses.

637 Epidemiology of Nutrition Spring. 3 credits.
Limited to graduate students. Prerequisite: permission of instructor. S-U grades only.
Hours to be announced. J-P. Habicht, J. B. Mason.
Course covers basic principles of nutritional epidemiology, evaluation, and surveillance. The concept of nutrition as a determinant of health, the relationship between nutrition and the effects of foreign chemicals. Students are offered an overall view of compounds to which we are exposed, including natural food toxicants, food additives, water pollutants, pesticide residues, and radioactive wastes, as well as medications and illegal drugs. A factual and scientific background is developed so students can interpret information and misinformation circulated in the news media.

652 Nutrition Counseling Spring. Meets 2½ hours during each of the first 11 weeks of the semester. 2 credits.
Limited to graduate students in the Clinical Nutrition Program.
Prerequisites: NS 441, 442, and permission of instructor. S-U grades only.
Lectures on nutritional aspects and physiological, biochemical, and hormonal relationships of the prominent macro- and microelements, with emphasis on recent developments. Students are offered an integrated summary report is required prior to group discussion.

653 Clinical and Public Health Nutrition Fall. 3 credits.
Prerequisite: NS 331, Letter grade only.
M W F 10:10, plus 20 hours during the semester working with elderly individuals in the Ithaca area.
D. Roe.
Emphasis is given to effects of aging, particularly as these change food habits, alter digestive processes, or decrease nutrient utilization. Causes of nutrient overload and malnutrition are discussed. 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.

654 Geriatric Nutrition Spring. 3 credits.
Prerequisite: NS 331, Letter grade only.
Selected by a professor or a group of students, students. Required for graduate students in clinical nutrition.
Limited field experience is offered.
J. Rivers, 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, summer. 15 credits maximum. Limited to graduate students in clinical nutrition.
Prerequisites: NS 441, 442, 652, 630, 631, 632, and 633. S-U grades only.
Limited field study at off-campus clinical sites.
R. Holmes, V. Utermohlen, J. Rivers.
The delivery of nutritional care in hospitals, outpatient clinics, and community settings.

680 International Nutrition Problems, Policy, and Programs Fall. 3 credits.
Prerequisite: permission of instructor.
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 (even-numbered) years. Not offered 1983–84. M 12:20–2:15. L. Stephenson and staff. 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 762) Spring. 2 credits. Prerequisite: calculus. S-U grades optional. Offered alternate years. Not offered 1983–84. T 7:30–9:30 p.m. D. Zilversmit. Quantitative analysis of the transport and distribution of nutrients, metabolites, and drugs in multicompartmental systems. The material will be presented as lectures, discussion groups, and assignments.

[690] Seminar on Nutrition and Behavior (also Psychology 690) Spring. 3 credits. Limited to 25 students. Prerequisite: a course in psychology and NS 361 and permission of the instructor. S-U grades optional. Offered alternate years. Not offered 1983–84. T R 10–11:15. 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 hyperactivity, 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. Hours to be announced. M. Latham and division faculty. The role of nutrition in national development. Emphasis is on the interdisciplinary nature of the programs and policies needed to solve the food and nutrition problems of low-income countries and communities. Planning of programs and evaluation of alternate strategies designed to improve nutrition are discussed, using examples from particular countries.

[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 occasions it may involve laboratory or field studies. Because the topics may change, this course may be repeated for credit.

[702] Seminar In Nutritional Toxicology (also Toxicology 702) Fall or spring. 1 credit. S-U grades only. T 12:20–2:10. 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

Aron, William J., Ph.D., U. of N. Dakota. Prof.
Armbuster, 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.
Birek, Muriel S., M.S., Michigan State U. Assoc. Prof.
Campbell, T. Colin, Ph.D., Cornell U. Prof.
Cowell, Catherine, M.S., U. of Connecticut. Adjunct Prof.
Devine, Marjorie M., Ph.D., Cornell U. Prof.
Gillespie, Ardyth, Ph.D., Iowa State U. Asst. Prof.
Haas, Jere D., Ph.D., Pennsylvania State U. Assoc. Prof.
Habicht, Jean-Pierre, Ph.D., Massachusetts Inst. of Technology. James Jamison Professor of Nutritional Epidemiology
Kazeroosh, Michael N., Ph.D., Cornell U. Asst. Prof., Nutritional Sciences/Biochemistry, Molecular and Cell Biology
Klipstein, Ruth N., M.S., Michigan State U. Prof.
Kumanyika, Shiriki K., Ph.D., Cornell U. Prof.
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.
Morrison, Mary A., Ph.D., U. of Wisconsin. Prof.
Nesheim, Maiden 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.
Rivers, Jerry M., Ph.D., Pennsylvania State U. Prof.
Rivin, Richard S., M.D., Harvard U. Adjunct Prof.
Sanjuri, Diva M., Ph.D., Cornell U. Prof.
Stephenson, Lani, Ph.D., Cornell University. Visiting Asst. Prof.
Stipanuk, 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, Lennart P., Oregon State Coll. Prof.
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, Date, Assoc. Prof., Animal Science/Nutritional Sciences
Combs, Gerald F., Jr., Assoc. Prof., Poultry Science/Nutritional Sciences
Devine, Marjorie M., Assoc. Prof., U.S. Plant, Soil, and Nutrition Laboratory/Nutritional Sciences
Eisen, Peter J., Prof., Animal Science/Nutritional Sciences
Smith, G. Richard, G., Animal Science/Nutritional Sciences
VanScoot, Peter J., Prof., Animal Science/Nutritional Sciences
Warner, Robert G., Prof., Animal Science/Nutritional Sciences
Wasserman, Robert H., Prof., New York State College of Veterinary Medicine/Nutritional Sciences
Young, Robert J., Prof., Animal Science/Nutritional Sciences

Faculty Roster 339
Officer Education

Lieutenant Colonel David J. Boyle, Infantry, United States Army, Professor of Military Science and Commanding Officer, United States Army ROTC Detachment

Military instruction began at Cornell University in 1868 under 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 de-emphasizes 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, Navy, Marines, or 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 David J. Boyle, Infantry, United States Army, Professor of Military Science and Commanding Officer, U.S. Army ROTC Detachment

Major Richard L. Slinkard, Adjutant General Corps, United States Army

Captain James R. Patton, Adjutant General Corps, United States Army

Captain Gary S. Tumane, Chemical Corps, 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 to serve 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, military applications of general academic subjects that assure a well-rounded education, practical training in leadership through participation in the Cadet Corps (including attendance at a six-week summer camp at an Army installation), and the opportunity to participate in a number of extracurricular activities. The combination prepares the student for commissioning and effective performance in most of the many branches of the Army. The student's academic major, academic performance, leadership ability, personal desires, and the needs of the Army determine the branch of the Army in which he or she is commissioned upon graduation.

Requirements for Enrolling

Applicants must be citizens of the United States. (Noncitizens may enroll and will receive certificates acknowledging completion of the course but do not receive commissioning.)

An applicant's vision must be correctable to a minimum of 20/20 in one eye and 20/400 in the other eye. Height must be at least sixty inches for men, fifty-eight inches for women, and no more than eighty inches for men and seventy-two inches for women, although exceptions will be considered. The weight requirement varies according to height and sex. Overall sound mental and physical condition is essential, and students are required to undergo periodic physical examinations. Enrollment in the program is subject to the approval of the professor of military science.

Enrollment in specific courses by students not formally enrolled in the program must be approved by course instructors.

Four-Year Program

The Four-Year Program is open to students in their freshman year or, with the approval of military and University authorities, to sophomores in a five-year degree program. Veterans of the Armed Forces of the United States and Cornell AROTC credit from secondary or military schools (Junior Division AROTC) may receive advanced standing.

Under the Four-Year Program students pursue the Basic Phase (Mil S I and II) during the first two years, and during the next two years the Advanced Phase (Mil S III and IV). A total of twelve credits of military subjects is required. In addition, a number of non-officer-education academic-enrichment subjects are recommended. These enrichment courses are in such fields as communication arts, psychology, sociology, political science, mathematics, and philosophy. Specific requirements are determined by the student and his or her adviser after initial enrollment. Throughout the years, cadets spend an additional 1½ hours each week each semester in practical leadership training for which there is no academic credit. All cadets attend a six-week camp, with pay, between the junior and senior years.

Basic Phase (Mil S I and Mil S II)

Students in the first year of the Basic Phase take one classroom course in military science in the fall and spring semesters, for which they receive academic credit. These courses include: (1) Principles of 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, and rifle marksmanship. They are designed to promote personal development and enrichment. While these activities do not receive academic credit, students can elect to receive physical education credit. Typical freshman participation in Army Officer Education is 4½ 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 S III and Mil S IV)

The Advanced Phase of the Four-Year Program is open to students who have successfully completed the Basic Phase and are accepted by the professor of military science for further enrollment. It is also open to students who have gained appropriate advanced standing through either successful completion of basic summer programs (see the description of the Two-Year Program) or prior military training. Any student entering the Advanced Phase must have two years of academic work remaining at Cornell or another degree-granting institution. The student must pass such physical and aptitude tests as may be prescribed. In addition, the past performance and desire of each student is evaluated to determine if he or she has the potential for eventual commissioning.

When students are accepted for the Advanced Phase, they execute a written contract with the United States government. Under terms of the contract, they agree to complete the Advanced Phase and to accept Commission in the U. S. Army. Concurrently with the signing of the contract, students enlist in the United States Army Reserve for control purposes.

Classroom study in the Advanced Phase includes one military science course each semester on such subjects as leadership and management, small-unit tactics, and communication and operations functions. The 2½ hours a week of practical leadership training continues, and between the junior and senior years all cadets attend a six-week advanced summer camp currently conducted at Fort Bragg, North Carolina.

Two-Year Program

The Two-Year Program consists of the last two years (the Advanced Phase) of the regular Four-Year Program. In order to qualify for the Two-Year Program a student must successfully complete a basic six-week summer camp.

The Two-Year Program is open to selected students who have two years of academic study remaining at Cornell or any other degree-granting institution. Applications are accepted from December to April. Selectees complete the basic six-week camp or the three-week summer officer education program before registering in the Advanced Phase the following fall. They must also meet specified physical requirements and execute the same written contract as those students who enter the Advanced Phase after completing the regular Basic Phase.

Scholarships

Scholarships are awarded on the basis of merit and are available for one, two, three, or four years. AROTC scholarships are awarded each year to outstanding Basic Camp participants and students in the freshman, sophomore, and junior classes. Cadets who are awarded scholarships continue to receive support until graduation, as long as they fulfill the requirements. The active duty requirement for all scholarship students is four years.

Scholarship cadets receive funding for University tuition, required fees, required textbooks, and classroom materials for the duration of their scholarship. Basic-course scholarship 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 (DMG). All cadets, scholarship and nonscholarship, are eligible to compete. DMGs may be commissioned in the Regular Army rather than the Army Reserve; those who are so commissioned enter the Army on the same basis as graduates of the United States Military Academy at West Point.

Service Obligations

A variety of active duty and reserve combinations are available. Nonscholarship 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 minimum requirements of the Army determine the proportion of officers who serve in each category. Current trends indicate that requests for active duty for three years by nonscholarship, non-Regular Army officers will be approved. However, it is a selective process. Similarly, requests for limited active duty (three to six months for training only) are selectively approved. An officer beginning three years active duty first attends the Basic Officer Course (normally eight to twelve weeks) of the assigned branch. Upon completion of this course the officer is assigned to a unit and location that is determined by the desires of the individual and requirements of the Army. Those officers selected for three to six months attend the Basic Officer Course, after which they are released to Reserve status. Nonscholarship cadets accepting a Regular Army commission serve a minimum of three years on active duty followed by three years on Reserve status.

Every scholarship cadet (whether commissioned in the Regular Army or the Reserve) serves four years on active duty and two years on Reserve status.

Choice of Branch

Cadets in the second year of the Advanced Phase (normally the senior year) may specify the branch of the Army—such as Infantry, Corps of Engineers, Armor, Signal Corps, Artillery, Air Defense, Ordnance, Chemical, Adjutant General, Judge Advocate General, Finance, Medical Service, Military Intelligence, Military Police—in which they prefer to serve. They are notified in the spring, before commissioning, of the branch to which they are assigned. The likelihood of appointment in a chosen branch depends upon the student’s academic and officer education performance, degree area, and the needs of the Army at that time.

Graduate Study

Active duty deferments may be granted to individuals who want to attend graduate school at their own expense after commissioning. Current policy is to approve all requests for active duty deferment for graduate school for two years (three years for law school). Requests for longer deferments will be considered on an individual basis.

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 spring semesters), each cadet receives approximately $550 and an allowance for travel to and from camp. Uniforms, textbooks, and supplies required for AROTC instruction are provided by the Army.

A cadet in the Two-Year Program receives the same payments as cadets in the Advanced Phase and, in addition, receives approximately $450 and a travel allowance for basic summer camp attendance before entering the Advanced Phase.

Military Science Courses

All cadets take one course 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 First-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.

3 classes each week. Presentation by Army, Marine Corps, and Navy instructors withers primarily from government and departmental studies. A study of modern warfare that examines the relationship of military strategy to geography, economics, sociology, technology, and political realities, and the evolution of warfare, including principles of warfare, weapons, and associated equipment, and the effects of nuclear weapons and guerrilla warfare on traditional concepts of national strategy.

MIL S 221 Mapping: Land Navigation Spring. 1 credit. 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 offer practical experience in land navigation and orienteering.

Junior Year (MIL S III)

MIL S 332 Theory and Dynamics of the Military Team Fall. 2 credits. Required. Staff.

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 tacitual application of the military team. Through the use of conferences and extensive practical exercises, students develop familiarity with the factors influencing the leader’s decisions; the processes of planning, coordinating, and directing the operations of military units to include troop-leading procedures, and development of operation plans and orders.

Senior Year (MIL S IV)

MIL S 424 Contemporary Military Environment I Fall. 2 credits. Required. Staff.

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 relations, actions, and the various elements of small-unit administration.

MIL S 461 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 AROTC students and Basic Phase students belong to a cadet organization for the purpose of participation in practical leadership experiences. The cadet organization meets formally for 1 1/2 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, while 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 each 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. Types of practical laboratory activities include an introduction to rifle marksmanship, marksmanship, physical training, land navigation and orienteering, signal communications, tactics, and orientation and training exercises at military installations.

As with many laboratory periods, no credit is given, and participation is required for successful completion of the AROTC program. Students register as follows:

MIL S I Leadership Laboratory I Fall. 3 credits. Required. Staff.

MIL S 141 Spring. 2 credits. Required. Staff.

MIL S 142 Not offered MIL S 242

MIL S II Leadership Laboratory II Fall. 2 credits. Required. Staff.

MIL S 241 Spring. 2 credits. Required. Staff.

MIL S II Leadership Laboratory II Fall. 2 credits. Required. Staff.

MIL S III Leadership Laboratory III Fall. 2 credits. Required. Staff.

MIL S 341 Spring. 2 credits. Required. Staff.

MIL S 342
Cadets meet for 1 ½ hours a week to prepare for a six-week summer training session 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.

Scholarship Program

The Naval Officer Education Program provides six thousand scholarships to over fifty-five universities nationwide to selected students who want to serve in the Navy or Marine Corps. Financial support is provided to students attending college and not exceeding the award of the baccalaureate degree.

Benefits

The program provides uniforms, full tuition, most instructional fees, textbooks, nonconsumable supplies, and $100 a month for a maximum of forty months. Successful completion of the Scholarship Program leads to a commission in the Regular Navy or Marine Corps. At Cornell University over 80 percent of naval scholarship students receive a commission. In the past, of those students who have entered the Cornell program without a scholarship, more than 80 percent have been successful in obtaining one.

Entering the Scholarship Program

There are three ways to enter the Scholarship Program:

First, by applying for the national competition each year. This entails filling out and sending an appropriate application, being interviewed; having a physical examination; and applying to, and being accepted by, one of the NROTC colleges or universities throughout the country.

Second, by enrolling in the College Program at Cornell and being recommended by the professor of naval science for a scholarship after at least one year in the program.

Third, by entering one of the Two-Year College Programs.

College Programs

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 professional courses, uniforms, and a subsistence allowance of $100 a month from the beginning of the junior year.

The regular College Program is three to four years long. Academic requirements for students in this program are somewhat less than those for scholarship students, as noted in the curriculum section.

The Two-Year College Program begins the summer before the junior year, when students attend a required program, with pay, at the Naval Science Institute in Newport, Rhode Island.

Summer Training

Each summer, students in the Scholarship Program spend approximately four to six weeks on a Navy ship, the unit-sail-training vessel Sorcery, 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, naval officers are paid approximately $400 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 to being appointed midshipman, USNR, and receiving compensation. Students that are discharged from the NROTC Naval-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.

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 service 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 appointed as Marine-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 midshipmen 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 Marine officer may serve on board naval vessels or at shore installations of the Marine Corps or Navy, in this country or overseas.

The Marine Corps has a postgraduate educational system similar in objectives and organization to that of the Navy. Marine-option midshipmen, as noted in the curriculum section, receive flight training at the Naval Air Station, Pensacola, Florida, along with their Navy counterparts.

Curriculum

A student has three categories of requirements to fulfill as a midshipman in the Naval Officer Education Program. The first of these requirements is a weekly naval professional laboratory each semester. The second requirement is a naval science course each semester. The last set of requirements consists of other required courses prescribed by the Navy to meet the growing need for more and better technically educated junior officers.

Naval Professional Laboratories

Nav S 141 - 142, 241 - 242, 341 - 342, or 441 - 442

All students in the naval program participate in one ninety-minute laboratory session each week. The session is held from 2:30 until 4:00 on Wednesday afternoon. This period is planned and implemented not under 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 service ships and submarines, naval aviation, and large and small surface ships.
or five small sailboats. Students gain experience in actual leadership situations and at the same time learn the fundamentals of seamanship, military formations, movements, commands, discipline, courtesies, and honors. During information briefings special emphasis is given to applied leadership as it relates to the administrative and managerial aspects of a Navy or Marine Corps officer's duties.

Naval Science Courses

All Navy and Marine midshipmen take one naval science course together each semester during their freshman and sophomore years. Navy-option students continue to take a naval science course each semester during their junior and senior years. Marine-option students are required to take only the amphibious warfare course in either their junior or senior year, depending on when the course is offered. The number of hours a week spent in the classroom varies semester to semester, as does the credit received for each course.

Freshman Year

Nav S 101 Fundamentals of Naval Science Fall. No credit.
Lec-rec, 1 hour each week. Navy staff.
A study of fundamental aspects of naval science, including its conceptional 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 (also Mechanical and Aerospace Engineering 101) Naval Ship Systems Spring. 3 credits.
Lec-recs, 3 classes each week. R. L. Wehe.
An introduction to primary ship-systems and their interrelationship. Basic principles of thermodynamics, propulsion, mechanical operation, internal communications, electronics, ship structure, and other marine systems are considered.

Sophomore Year

Nav S 201 Naval Weapons Systems Fall. 3 credits. Prerequisites: Mathematics 192 or 112 and Physics 208 or 214.
Lec-recs, 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 development of an algorithmic solution method applicable to the digital computer.

Nav S 202 Seascape—History of the Navy Spring. 2 credits.
Semis, 2 each week. Navy staff.
Discussions examine the history of the Navy as a force in diplomacy. Relationships between Congress and the military for determining the national defense policy are also explored.

Junior Year (Navy)

Nav S 321 Naval Operations Fall. No credit.
1 hour 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 (also Agricultural Engineering 305) Principles of Navigation Spring. 4 credits.
Lec-rec-project work, four classes each week.
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 (also Hotel Administration 414) Organizational Behavior and Small Group Processes Fall or Spring. 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 topics should be of interest to 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 Naval 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.
3 classes each week. Presentations by Marine Corps and Navy instructors with guest lecturers, primarily from government and history departments.
A study of modern warfare that examines the relationship of military strategy to geography, economics, sociology, technology, and national political realities and values; the evolution of warfare, including principles of war, weapons, and associated equipment; and how the tactics, weapons and guerrilla warfare on traditional concepts of national strategy.

Junior or Senior Year (Marines)

Nav S 311 Amphibious Warfare Spring. 3 credits.
Lec-recs, 3 each week. Marine Corps staff.
The history of the development, theory, techniques, and conduct of amphibious operations in the twentieth century. Special emphasis will be on amphibious operations conducted in the central Pacific during World War II.

Other Required Courses

Naval Option

In order to receive commissions in the United States Navy, midshipmen must complete all the requirements for a baccalaureate degree as well as certain academic requirements specified by the Navy. Study-in engineering and scientific fields is required for a majority of Navy-option scholarship students. Specifically, 80 percent of the Navy-option scholarship students are encouraged to pursue majors in engineering and approved sciences (chemistry, mathematics, physics, computer science, oceanography, operations analysis, or the physical sciences) to meet the technological requirements of the modern Navy. 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 educators of officers of the unrestricted line are:

- Asian studies
- chemistry
- computer science
- economics
- engineering
- European studies
- foreign affairs
- history
- Latin American studies
- management
- mathematics
- marine science
- oceanography
- operations analysis
- physical sciences
- physics
- public administration
- Soviet studies
- world history

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 complete two science or engineering courses as electives.

College Program Navy-Option Students

College Program students who desire entry into the Navy-Option Scholarship Program should fulfill all 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 course (a minimum of three hours each) in the following subject areas are required, the intent being to broaden the base of knowledge of the individual. The specific course chosen must be approved by a Marine Officer Instructor (MOI).

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 educators of officers of the unrestricted line are:

- Anthropology
- Behavioral sciences
- Communication methods
- Computer science (upper level)
- Economics
- Geography
- Languages
- Management engineering
- Philosophy
- Political science
- Sociology
- World history

Naval Science 343
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
- Physics
- Phys 112 and 213 or 217
- Phys 207–208 Fundamentals of Physics
- Chemistry
- Chem 103–104 Introduction to Chemistry
- Chem 207–208 General Chemistry
- H Adm 171–172 Food Chemistry
- Computer Sciences
- Engr 105 Introduction to Computer Programming
- Com S 102 Introduction to FORTRAN Programming
- Com S 211 Computers and Programming
- Com S 314 Introduction to Computer Systems and Organization
- M&AE 389 Computer-aided Design
- Com S 436 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
- I&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-training vessel Sorcery 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 Sorcery, 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 four of the last five 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

The objective of the Air Force 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.

Entering students are assigned to one of four categories: flying (pilot/navigator), missile, engineering-science, and general service. These assignments are based on the student's preferences, qualifications, academic field of study and the needs of the Air Force.

Requirements for Enrollment

The Air Force Officer Education program is open to any undergraduate or graduate student enrolled in any major field of study. The student's academic course of study is often a prime factor in determining the kind of career pursued in the Air Force. (See Air Force Careers, below.)

Applicants must be United States citizens. Noncitizens may enroll and will receive certificates acknowledging completion of the course but cannot receive a commission.

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, Developmental Science 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. Height must be normal for height and age. Furthermore, 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 20/70 without correction, providing it is correctable 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 Cornell from military schools may receive advanced standing, subject to approval by the professor of aerospace studies.

The Four-Year Program consists of the Basic Program (first two years) and the Professional Officer Course (advanced program) during the junior and senior years. The Basic Program carries no military commitment and students may withdraw at any time during that period.

Basic Program

Students in the Basic Program take one credit of classroom work offered by the Department of Aerospace Studies each semester. During the freshman year the role of the United States military forces in the contemporary world is examined with emphasis on human rights and the organization and mission of the United States Air Force. The functions of strategic offensive and defensive forces, general-purpose forces, and aerospace support forces are covered. In the sophomore year, the history and development of military aviation and American air power are studied.

Students also spend one hour a week in a leadership laboratory, which includes classroom instruction in responsibilities and 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.

Professional Officer Course

The Professional Officer Course (POC) is a two-year advanced course of instruction. Students who are accepted for the POC must have successfully completed a four-year bachelor's degree program 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 environment in which national security and the place of the military in American society. Leadership laboratory requires a minimum of one hour a week in the junior and senior years. In the leadership laboratory the cadet is exposed to such leadership experiences and applies principles of management learned in the classroom.

Flight Instruction Program

All cadets accepted for pilot training participate, in their senior year, in the Air Force ROTC flight instruction program at no cost.

This program consists of ground school and twenty-five hours of flying training in a light aircraft. Instruction is provided by a local civilian flying school. Upon completion of the program a cadet may continue training for a private pilot's license through the Federal Aviation Agency.

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 November through May 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. Three- and two-year scholarships are awarded annually on a competitive basis to students enrolled in the Air Force Officer Education Program. Applicants to the Two-Year Program are also eligible to be considered for scholarships. The 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 in any active duty with the Air Force.

The vast majority of two-, three-, and four-year scholarships are limited to students majoring in engineering, physics, mathematics, computer science, and atmospheric science. A limited number
of four-year scholarships are available to those enrolled in nontechnical academic majors such as business administration, accounting, and foreign languages. Some two- and three-year scholarships are awarded to students in nontechnical academic majors who desire to become navigators or missile launch officers.

A scholarship cadet receives a $100-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, nontaxable subsistence allowance for the academic year. During the four- or six-week summer field training each cadet receives pay equal to one-half of a second lieutenant's salary, plus an allowance for travel to and from the field site. Most textbooks and supplies required for Department of Aerospace Studies courses are provided.

All cadets are eligible to participate in field trips made to Air Force bases throughout the country. Scholarship and advanced cadets (POC) are entitled to space-available rides on all aircraft flying within the continental United States.

Field Training
There are two types of field training: a four-week course for cadets in the Four-Year Program and a six-week course for Two-Year Program applicants. Students of either program 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 among students through meaningful experiences. This is accomplished through the field training curriculum and associated activities. The curriculum consists of aircraft, crew, and survival orientation; junior officer training; physical training; small arms training; a social-action program; and supplemental training. Special emphasis is placed on career orientation and interaction with young officers in fields of interest to the student. The six-week field training program differs in that it has 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.

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 the summer following their junior year. As "third lieutenants," cadets receive specialized career orientation and an opportunity to experience leadership, human relations, and management challenges encountered by Air Force junior officers.

Cadets also have an opportunity to become familiar with the Air Force way of life. Cadets receive pay and allowances authorized by current directives at the time of Advanced Training attendance.

Air Force Careers
Air Force policy has been to assign new officers to a career field appropriate to their educational background. Students in the engineering-scientific category may be assigned to practice in their specialty in research and development, communications, aeronautics, astronautics, design and development, the biological sciences, computer design and maintenance, meteorology, or various other engineering and scientific fields. They will work under the supervision of some of the most highly qualified people in their field and 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 in that field. Upon completion of school they will be assigned to one of the operational missile bases as a crew member. This type of assignment provides an opportunity 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 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 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.
1 class each week. J. Pallay.
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.
1 class each week plus a field trip to a local military installation. J. Pallay.
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.
1 class each week. P. H. Wendzikowski.
Factors leading to the development of aviation, and the concepts and doctrine for the employment of air power are studied. Topics to be reviewed and analyzed include the history of manned flight, the effects of World War I on the uses of aviation, and the development of pre-World War II aircraft and the political struggles for an independent United States air arm. The role of air power in World War II, including strategic bombing, tactical air power, and the role of air superiority in warfare, is examined.

Department of Aerospace Studies 345

Air S 212 American Air Power since 1947 Spring 1 credit.
1 class each week. P. H. Wendzikowski.
The employment of the Air Force since World War II in military and nonmilitary capacities is discussed. The role of air power in the Korean conflict, and the Vietnam War are examined from the viewpoint of technology and tactical doctrine.

Junior Year
Air S 331 Leadership and Communicative Skills Fall 3 credits.
2 or 3 classes each week. M. R. McFarren.
Leadership responsibilities at the junior officer level, including the responsibility, authority, and functions of a military commander and his staff, emphasizing management research approaches to leadership models and the importance of communication skills in any leadership role are considered. Case study exercises and oral and written assignments are required.

Senior Year
Air S 332 Management in the Armed Forces Spring 3 credits.
2 or 3 classes each week. M. R. McFarren.
Management at the junior officer level. Basic concepts of management and decision-making process, including planning, organizing, coordinating, directing, and controlling. Evaluation processes and techniques used by managerial officers are studied. Position of management in the world of power and politics, including managerial strategy and tactics, is considered. Case studies and oral and written assignments are required.

Air S 461 National Security Forces in Contemporary American Society I Fall 3 credits.
2 or 3 classes each week. P. A. Gifford.
The functions and roles of the professional officer in a democratic society and how they relate to the socialization processes, prevailing public attitudes, and value orientations associated with professional military service are examined. Changes within the military are analyzed, including such topics as the all-volunteer service, race relations, and the impact of women in the armed forces. The essential features of the military justice system as it functions to protect basic human rights and organizational order are reviewed. The formation and implementation of defense policy, including political, economic, and social constraints, are studied.

Air S 462 National Security Forces in Contemporary American Society II Spring 3 credits.
2 or 3 classes each week. P. A. Gifford.
A study of United States national security policy that examines the formulation, organization, and implementation of national security; the context of national security; the evolution of strategy; the management of conflict, and civil-military interaction. The course is designed to provide future Air Force officers with a background of United States national security policy so they can function effectively in today's Air Force.
Elective Course

Air S 405  Principles of Air Navigation and Aircraft Systems  Fall. 3 credits. Not offered 1983–84
2 classes each week.
Basic principles of weather elements, aerodynamics, aircraft systems, engine systems, and navigation systems. The study of these systems is integrated with chart projections, navigational aids, flight instruments, and avionics. Use of flight computer will be covered. This will prepare students for FAA Private Pilot Ground School Test.

Leadership Laboratory Courses

All Air Force cadets spend at least one hour 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 Veteran’s 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 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-analyses 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.
The Program

Cornell is proud of its diversified physical education program—unique in its concept and tradition of excellence—that encompasses over seventy recreational activities, ranging from the aquatic depths of 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 athletic 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 gymnasmum during the academic course registration period. Dates and times are publicized with other registration information each semester. All classes for those in the required program are filled on a first-come-first-served basis. A $25 penalty fee is charged by the 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.

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 two 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 in a competitive sport;
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 (excused or unexcused) without penalty in each twelve-week course taken per term. Proportional adjustments will be made for courses lasting less than twelve weeks. Students are allowed to make up two unexcused absences in excess of the three allowed per term. Medical excuses do not constitute additional allowed absences; they are merely valid reasons for missing a class session and must be made up. A maximum of eight medical excuses (each of which must be cleared through Gannett Health Center at the time of the illness) is allowed per term. If medically excused absences exceed the three absences allowed without penalty per term, each one in excess must be made up.

Elective Enrollment

Elective (no-credit) enrollment is allowed, and encouraged. However, an elective student is required to attend a minimum of one-half of the total number of classes given in that course. Penalty for noncompliance is a $10 drop fee.

Faculty and staff and their spouses and dependents are welcome to participate in the physical education program whenever class space is available. A general entrance fee of $25 is charged in addition to any specific course fees. These fees are to be paid by cash or check at the time of course registration.

Facilities

Teagle Hall, at the corner of Garden Avenue and Schoellkopf Drive, is the administrative headquarters for the physical education and athletics program. Department offices (telephone 256-4286) are in the west end of the building. Teagle contains two swimming pools, crew practice tanks, a wrestling room, a fencing room, weight-lifting rooms, an open gym floor, and a steam room. Classes in basketball, fencing, karate, lacrosse, scuba diving, softball, swimming, and water safety, weight lifting, and volleyball are held here. When academic classes are in session, Teagle is open from 9:00 a.m. to 11:00 p.m. Monday through Friday, 10:00 a.m. to 6:00 p.m.
348 Physical Education

on Saturday, and noon to 6:00 p.m. on Sunday.
During the summer the building is open Monday through Friday only, 9:00 a.m. to 7:00 p.m.

Helen Newman Hall, situated at the end of South Balch Drive, is the headquarters for the women's intercollegiate program (telephone: 256-1333). The building contains a swimming pool, dance studios, a rifle range, sixteen bowling alleys, a large open gym floor, and a sauna room. Classes in badminton, basketball, bowling, dance, fencing, physical conditioning, rifle, swimming, tennis, and volleyball are held here. When academic classes are in session, Helen Newman is open from 8:00 a.m. to 11:00 A.M. Monday through Friday; 9:00 a.m. to 5:00 p.m. on Saturday, and 10:00 a.m. to 6:00 p.m. on Sunday. During the summer it is open Monday through Friday only, 8:00 a.m. to 7:00 p.m.

Barton Hall, situated on Garden Avenue opposite Teagle Hall, contains a large open gym floor. Classes in badminton, first aid, hunter safety, jogging, physical fitness, volleyball, and weight control are held here.

Lyman Rink is used for classes in figure skating, hockey, and ice skating, as well as for public skating sessions during scheduled hours from late October until mid-March.

Schoelkopf Hall is used for Nautilus and weightlifting exercises. Classes in racquetball and squash are held in the Grumman Squash Courts, and archery and professional golf instruction are offered in the Bacon Cage.

Other facilities used in the program include the Oxley Polo Arena for polo and riding instruction, Moakley golf course for recreational golf; the Kite Hill indoor tennis bubble, the Tompkins County Rod and Gun Club for skeet and trapshooting, and Greek Peak, Virgil, New York, for skiing.

Schedules for use of all athletic facilities can be obtained from the Teagle Hall and Helen Newman Hall main offices.

Use of Facilities and Equipment

In the event conflict arises about the use of departmental 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 a basket and combination lock. Basket for men and women are both available in 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 can rent a solid-color gym uniform for use during the term from the locker-room staff in Teagle Hall. Uniform rental at Helen Newman Hall is limited to women's swimsuits.

Students are allowed to borrow small equipment items, such as basketball shoes, skis, punch-bag gloves, or horse shoes, 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., volleyball nets but not poles; softballs and softball bases and bats) from Helen Newman and Teagle halls for up to seven days at the start of the fall or spring semester. A deposit is required.

Faculty-Staff Use of Facilities

Faculty and staff may be eligible to use Teagle halls by paying a yearly membership fee. Members are issued a basket and lock and are provided with a gym uniform and towel on a daily basis.

Faculty and staff may participate in any physical education class on a space-available basis; all related fees must first be paid (see Elective Enrollment).

Use of Swimming Facilities

All students may use the swimming facilities in Teagle 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 swimming pool 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. 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 for single-sex or 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.

Basketball Fall and spring.
Two classes a week, Teagle Hall.
Fundamental drills in passing, shooting, and dribbling. Scrimmages each class session.

Bowling Fall and spring. Fee charged.
Two classes a week, Helen Newman Hall.
For the beginning and intermediate bowler. Shoe rental is included in the fee.

Competitive Sports and Games
Fall and spring.
Two classes a week, Teagle Hall.
Potpourri of games that can be used in schools and camps and on playgrounds.

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.

Exercise and Figure Control
Fall and spring.
Two classes a week, Helen Newman Hall.
Ways in which exercises may be used in weight control, the role of nutrition and diet in weight control, and the design of an individual exercise and running program.

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. Primarily designed for beginners.

Judo
Fall and spring. Fee charged for uniform.
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, Teagle Hall.
Instruction and practice in basic skills (cradling, passing, catching, goal shooting, checking) and team play.

Martial Arts and Aerobic Exercises
Fall and spring.
Three classes a week, Teagle Hall.
Blend of ten basic martial art techniques in a framework of rhythmic exercises.

Nautilus
Fall and spring. Enrollment limited to capacity of facilities. Fee charged.
Two classes a week, Teagle Hall.
Advanced weight lifting on specifically designed apparatus. There are ten stations in the room.

Racket Games
Fall and spring.
Two classes a week, Teagle Hall.
Table tennis, racquetball, squash, badminton, and deck tennis. Playing fundamentals, scoring, and rules are stressed. Interclass competition.

Racquetball
Fall and spring. Fee charged.
Two classes a week, Teagle Hall.
Instruction at all levels. Equipment is furnished.

Soccer
Spring.
Two classes a week, Teagle Hall.
Introduction to the game. Includes basic individual skills (passing, trapping, volleying) and team play and strategy.
Softball  Fall  Two classes a week, Lynah Rink. Fundamentals of each position are taught. Bats, balls, catcher’s masks, and bases are provided. Interclass team competition.

Squash  Fall and spring. Fee charged. Two classes a week, Grumman Squash Courts. Classes for all levels of play. Equipment is furnished.

Weight Training  Fall and spring. Two classes a week, Teagle Hall. Classes include instruction in correct lifting techniques involving all muscle groups. Recreational classes are established for experienced lifters; structured classes for novices.

Aquatic Courses

Beginning Swimming  Fall and spring. Two classes a week, Helen Newman Hall and Teagle Hall. Instruction and practice in basic skills leading to passing the basic swimming proficiency test.

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, Helen Newman Hall. Instruction in all the basic dives, including front (pike and layout), back, and front and back somersaults.

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.

Water Safety Instructor Refresher Course  Spring. Two classes a week, Teagle Hall. Selected sessions of the basic water safety instructor certification course.

Basic Scuba Diving  Fall and spring. Fee charged. One two-hour class a week, Teagle Hall. Beginning scuba — for general certification only. All equipment for pool sessions is provided: tanks, regulator, snorkel, and vest.

Advanced Open-Water Scuba Diving  Fall and spring. Fee charged. Hours to be arranged, Teagle Hall. Program includes skill training in a pool and open-water training in Cayuga Lake. Internationally recognized basic certification.

Beginning Synchronized Swimming  Fall. Two-hour class one evening a week, Helen Newman Hall. Sculling stunts, including the tub, marlin, 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.

Swimming Conditioning  Fall and spring. Prerequisite: good swimming ability. Two classes a week, Teagle Hall. Introduction to, and practice of, different training methods. Final objective: to swim 2,500 yards during class period.

Inner-Tube Water Polo  Fall and spring. Two classes a week, Teagle Hall. Ball handling, shooting, passing, basic offensive and defensive strategy. Scrimmaging while aloft on inner tubes.

Archery

Basic Archery  Fall and spring. Two classes a week, Teagle Hall. Instruction in the care of equipment, seven basic steps for shooting, scoring, practice shooting at twenty, thirty, and forty yards.

Intermediate Archery  Fall and spring. Two classes a week, Teagle Hall. 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.

Square Dancing  Spring. Students and their partners must sign up at course registration. Two classes a week, Helen Newman Hall. Introduction to square dancing.

Aerobic Dance  Fall and spring. Fee charged. Two or three classes a week, Helen Newman Hall. A simple dance program designed to keep the body fit and healthy.

Intermediate Ballet  Fall and spring. Two classes a week, Helen Newman Hall. Develops 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.

Asian Dance

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, Teagle 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, Teagle Hall. Interclass competition is stressed. Equipment is furnished.

First Aid

Basic First Aid  Fall and spring. Textbook fee charged. One or two classes a week, Teagle Hall. American Red Cross standard first-aid course. Certification is awarded on satisfactory completion of the course.

Athletic Training and Injury

Fall and spring. Textbook fee charged. Two-hour class one evening a week, Teagle Hall. Survey of anatomical, physiological, and psychological causes and results of athletic injuries.

Cardiopulmonary Resuscitation (CPR)  Fall and spring. No credit. Fee charged. One class a week for four weeks, Teagle Hall. American Red Cross CPR certification is issued on satisfactory completion of the course.

Golf

Instruction in Golf  Fall and spring. Fee charged. Two classes a week, Teagle Hall. Instruction by PGA professionals is geared to all levels of experience and ability. The objective is to give beginners enough skill to play, and to give more-advanced players direction in their thinking, practice, and play, through a thorough understanding of fundamentals. Equipment is furnished.

Recreational Golf  Fall and spring. Limited to students who are experienced golfers. Fee charged. Nine holes twice a week, 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 pieces of 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. Two classes a week, Teagle Hall. 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

Introduction to Backpacking 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.
Covers canoe repair, rest, weather, food, and transportation to local waterways.

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. Students must provide their own canoes.

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.

Rifelry

Rifelry Fall and spring. Fee charged.
Two classes a week, Helen Newman Hall.
Instruction and practice in the techniques of target rifling from various shooting positions.

Skeet and Trapshooting Fall and spring. Fee charged.
Two-hour class one afternoon a week, Teagle Hall.
Includes lectures 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, Teagle Hall.
Instruction in hunter safety and its approved state certification for bow and gun.

Sailing

Principles of Sailing Fall and spring. Fee charged.
One class a week, Teagle Hall.
Basic instruction in 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, Teagle Hall.
Instruction in more-advanced techniques for those already familiar with the basic principles of sailing.

Skating

Introduction to Skating Fall and spring. For beginners.
One class a week, Teagle Hall.
Instruction in basic skating skills and safety principles.

Beginning and Low-Intermediate Figure Skating Fall and spring. Fee charged.
Three classes a week for half a term, Lynah Rink.
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.
Three classes a week, Lynah Rink.
Advanced figure skating techniques. Students provide their own figure skates or rent them at Lynah Rink.

T'ai Chi Chuan

T'ai Chi Chuan I Fall and spring.
Three 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.

T'ai Chi Chuan II Fall and spring.
Three classes a week, Teagle Hall.
Designed for those who have completed T'ai Chi Chuan I or its equivalent.

Tennis

Indoor Tennis Spring. Fee charged.
Two classes a week, Teagle Hall.
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 Hall.
Instruction and practice in basic strokes (forehand, backhand, serve).

Intermediate Outdoor Tennis Fall.
Three classes a week for half a term, Helen Newman Hall.
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, Helen Newman Hall.
Emphasizes strategy.

Volleyball

Intermediate Volleyball Fall and spring.
Two classes a week, Helen Newman Hall and Teagle Hall.
Passing and blocking strategy, scrimmages in class.

Advanced Volleyball Fall and spring.
Two classes a week, Helen Newman Hall.
Offensive and defensive team strategy is emphasized in class scrimmages.

Yoga

Yoga I Fall and spring. Fee charged.
Two classes a week, Helen Newman Hall.
Fundamentals of Hatha Yoga. Covers basic postures, breathing techniques, and deep relaxation. Introduces chanting.

Yoga II Fall and 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 Courses, and Related Programs

Administration

Robert D. MacDougall, dean
Charles W. Jermy, Jr., associate dean
Fred L. Conner, manager, media services
Judith K. Eger, director, continuing education
research and development
Ed McKeeown, assistant to the dean
Valerie A. Sellers, registrar
Marjorie S. VanNess, business manager

The Division

The Division of Summer Session, Extramural Courses, 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

Summer Session provides unique and unusually attractive opportunities for study and recreation at a time when the Cornell campus and the Finger Lakes region of central New York are at their loveliest and the Ithaca weather is at its best. Students of all ages—high school seniors, 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, students should consult the Summer Session Office, B12 Ives Hall, or call 256-4987.

Cornell's Adult University

Cornell's Adult University (CAU) offers one-week, noncredit academic courses on campus during the summer and weekend seminars at off-campus locations during the fall and spring. Originally conceived as a program for alumni, CAU has greatly broadened its mission in the area of adult education. All courses and seminars are inspired by the belief that learning never ends and that one of the roles of a great university is to provide a bridge between traditional, formal education and informal, noncredit study. For more information, interested persons should consult Cornell's Adult University, 626B Thurston Avenue, or call 256-6260.

Extramural Courses

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 from 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.

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Among the courses offered in recent years have been study tours to England, the Soviet Union, and Costa Rica. For further information, interested persons should contact the Extramural Office in B12 Ives Hall or call 256-4987.

Continuing Education Information Center

The Continuing Education Information Center 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 the Continuing Education Information Center, B12 Ives Hall, or call 256-4987.

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 conference coordinator 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, 221E Robert Purcell Union, or call 256-6290.

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 1984. 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 1984 Announcement of Summer Session will be published in March.
352 Summer Session, Extramural Courses, and Related Programs

240 Plant Physiology
276 Comparative Anatomy
331 Principles of Biochemistry, Lectures
360 General Ecology
369 Embryology
421 Comparative Vertebrate Ethology
432 Survey of Cell Biology
475 Ornithology

Business and Public Administration
590 Management Communication

Chemical Engineering
220 Mass and Energy Balances

Chemistry
103–104 Introduction to Chemistry
207–208 General Chemistry
251–252 Introduction to Experimental Organic Chemistry
253 Elementary Organic Chemistry
300 Quantitative Chemistry
421 Introduction to Inorganic Research
433 Introduction to Analytical Research
461 Introduction to Organic Research
477 Introduction to Research in Physical Chemistry

City and Regional Planning
Consult the office of the Department of City and Regional Planning for a complete list of offerings in progressive planning.

Classics
Greek
101 Greek for Beginners
103 Attic Greek
Latin
105 Latin for Beginners
106 Elementary Latin
Classical Civilization
100 Word Power
109 Introduction to Rhetoric
150 The Myths of Greece and Rome

Communication Arts
301 Oral Communication
312 Advertising and Promotion
360 Scientific Writing for Public Information
363 Organizational Writing

365 Writing in the Sciences and Engineering
413 Writing for Magazines
460 Video Communication
461 Advanced Video Communication

Comparative Literature
113 Science Fiction
121 Literatures from the Third World

Computer Science
100 Introduction to Computer Programming
101 The Computer Age
211 Computers and Programming
314 Introduction to Computer Systems and Organization
410 Data Structures

Economics
101 Introductory Economics: Macroeconomics
102 Introductory Economics: Microeconomics
105 Principles of Accounting
205 Managerial Accounting for Planning and Control
311 Intermediate Microeconomic Theory
312 Intermediate Macroeconomic Theory
313 Intermediate Microeconomics
314 Intermediate Macroeconomics
315 History of Economic Thought
319–320 Quantitative Methods
331 Money and Credit
333 Theory and Practice of Financial Asset Markets
335 Public Finance: Resource Allocation and Fiscal Policy
351 Industrial Organization
352 Public Regulation of Business
361 International Trade: Theory and Policy
362 International Monetary Theory and Policy
368 Comparative Economics: United States, Europe, and the Soviet Union
371 Public Policy and Economic Development
381 Participation and Worker Management
383 Marxist Political Economy

Education
420 Field Experience
497 Informal Study
620 Internship in Education
744 Faculty Development: Improvement of College Teaching

800 Master's-Level Thesis
900 Doctoral-Level Thesis

Electrical Engineering
210 Introduction to Electrical Systems
676 Microprocessor Systems

English
133 Basic Forms of Writing
135 Writing from Experience
136 Practical Prose Composition
137 Writing Workshop
150 Introduction to Fiction
151 Reading Modern Literature
157 Classic American Authors
158 Modern American Authors
227 Shakespeare
270 The Reading of Fiction
271 The Reading of Poetry
280 Creative Writing
288 Expository Writing
289 The Art of the Essay
319 Chaucer
327 Shakespeare
380 Creative Writing Workshop
470 James Joyce: Ulysses
477 Children's Literature

Floriculture
210 Architectural Sketching in Watercolor

Geological Sciences
101 Introductory Geological Science
102 Introduction to Historical Geology
401 Summer Field Geology

German Literature
108 The Image of America in European Literature

Government
100 Politics and Moral Choice
111 The Government of the United States
131 Introduction to Comparative Government and Politics
161 Freedom and Justice in the Western Tradition: An Introduction to Political Theory
181 Introduction to International Relations
300 Politics of Terrorism
316 The American Presidency
Summer Courses

Comparative Revolution
Politics of the Middle East
International Law
The Politics of Education

History
Man and His Values in the Western Tradition
Introduction to Western Civilization to 1600
Introduction to Western Civilization

History of Art
Survey of European Art: Renaissance to Modern
Introduction to Art History: Modern Art

Hotel Administration
Typewriting

Human Development and Family Studies
Human Development: Infancy and Childhood
Human Development: Adolescence and Youth
The Family in Modern Society

Human Service Studies
Human Sexuality: A Biosocial Perspective

Human Ecology (Interdepartmental)
Preparation for Field Study: Perspectives in Human Ecology

Industrial and Labor Relations
Collective Bargaining
History of Industrial Relations in the United States
Collective Bargaining
Labor Relations Law and Legislation
Dramatic Events in Labor History as Told by Those Who Made It
Collective Bargaining in the Public Sector
Current Issues in Collective Bargaining
Economic and Social Statistics
Introductory Statistics for the Social Sciences
Labor Economics
Labor Problems in American Society
Economics of Wages and Employment
Organizational Behavior
Studies in Organizational Behavior: Regulating the Corporation
Comparative Theories of Organizational Behavior

Marine Science
Consult the Shoals Marine Laboratory office for a complete list of summer offerings in marine science.

Mathematics
Finite Mathematics with Applications
Precalculus
Analytic Geometry and Calculus
Calculus
Analytic Geometry and Calculus
Calculus
Linear Algebra
Engineering Mathematics
Elementary Statistics
Applicable Mathematics
Classical Geometrics

Mechanical and Aerospace Engineering
Technology, Society, and the Human Condition

Microbiology
General Microbiology, Lectures
General Microbiology, Laboratory

Modern Languages and Linguistics
Chinese
Introductory Intensive Chinese (Mandarin)
Intermediate Chinese
English
English as a Second Language
French
French Basic Course I

Music
The Art of Music
Introduction to Music Theory
Popular Music
Summer Session Choir

Natural Resources
Environmental Conservation
Diet for a Small Planet
Natural Resources and the World Food Situation

Near Eastern Studies
Elementary Modern Hebrew: Second Semester
The Holocaust: European Jewry, 1933–45
Ancient Seafaring
Modern History of the Middle East: Changing Politics, Society, and Ideas
Introduction to Field Archaeology in Israel

Operations Research and Industrial Engineering
Introductory Engineering Probability
Basic Engineering Probability and Statistics
Operations Research I

Philosophy
Philosophical Thinking
Introduction to Philosophy
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<tr>
<th>Course Number</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>103</td>
<td>Reasoning and Writing</td>
</tr>
<tr>
<td>131</td>
<td>Logic: Evidence and Argument</td>
</tr>
<tr>
<td>145</td>
<td>Contemporary Moral Issues</td>
</tr>
<tr>
<td>245</td>
<td>Biomedical Ethics</td>
</tr>
</tbody>
</table>

**Physical Education**

Consult the Physical Education Office for a complete list of summer offerings for credit and recreation.

<table>
<thead>
<tr>
<th>Course Number</th>
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<tbody>
<tr>
<td>101–102</td>
<td>General Physics</td>
</tr>
<tr>
<td>112</td>
<td>Physics I: Mechanics and Heat</td>
</tr>
<tr>
<td>213</td>
<td>Physics II: Electricity and Magnetism</td>
</tr>
<tr>
<td>214</td>
<td>Physics III: Optics, Waves, and Particles</td>
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<tr>
<td>400</td>
<td>Independent Study in Physics: Advanced Experimental Physics</td>
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<tr>
<td>500</td>
<td>Informal Graduate Laboratory</td>
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<tr>
<td>510</td>
<td>Advanced Experimental Physics</td>
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**Physics**

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<tr>
<td>101–102</td>
<td>General Physics</td>
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<tr>
<td>201–202</td>
<td>General Physics</td>
</tr>
<tr>
<td>213</td>
<td>Physics II: Electricity and Magnetism</td>
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<tbody>
<tr>
<td>101</td>
<td>Introduction to Psychology: The Frontiers of Psychological Inquiry</td>
</tr>
<tr>
<td>124</td>
<td>Control of Human Behavior: A Neuropsychological Perspective</td>
</tr>
<tr>
<td>128</td>
<td>Introduction to Psychology: Personality and Social Behavior</td>
</tr>
<tr>
<td>209</td>
<td>Developmental Psychology</td>
</tr>
<tr>
<td>214</td>
<td>Introduction to Psychology: The Cognitive Approach</td>
</tr>
<tr>
<td>281</td>
<td>Interpersonal Relations and Small Group Processes</td>
</tr>
<tr>
<td>282</td>
<td>Psychology of Stereotyping and Prejudice</td>
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<tr>
<td>286</td>
<td>Nonverbal Behavior and Communication</td>
</tr>
<tr>
<td>321</td>
<td>Psychological Development through the Life Span</td>
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<td>325</td>
<td>Introductory Psychopathology</td>
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<tr>
<td>350</td>
<td>Statistics and Research Design</td>
</tr>
<tr>
<td>402</td>
<td>Current Research on Psychopathology</td>
</tr>
<tr>
<td>440</td>
<td>The Psychology of Dreams and Dreaming</td>
</tr>
<tr>
<td>469</td>
<td>Psychotherapy Workshop: Its Nature and Influence</td>
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</tbody>
</table>

**Romance Studies**

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<tr>
<th>Course Number</th>
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<tbody>
<tr>
<td>201</td>
<td>Introduction to French Literature</td>
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<td>201</td>
<td>Introduction to Hispanic Literature</td>
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**Sociology**

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<tbody>
<tr>
<td>101</td>
<td>Introduction to Sociology</td>
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<tr>
<td>243</td>
<td>Family</td>
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<tr>
<td>252</td>
<td>Public Opinion</td>
</tr>
<tr>
<td>281</td>
<td>Interpersonal Relations and Small Group Processes</td>
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<td>Nonverbal Behavior and Communication</td>
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<td>347</td>
<td>Environment and Aging</td>
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**Theatre Arts**

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<tbody>
<tr>
<td>125</td>
<td>Writing for the Theatre</td>
</tr>
<tr>
<td>200</td>
<td>Introduction to Dance</td>
</tr>
<tr>
<td>240</td>
<td>Introduction to the Theatre</td>
</tr>
<tr>
<td>287</td>
<td>Summer Acting Workshop</td>
</tr>
<tr>
<td>374</td>
<td>Introduction to Film Analysis: Meaning and Value</td>
</tr>
<tr>
<td>474</td>
<td>Intensive 16-mm Film Production</td>
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</table>

**Theoretical and Applied Mechanics**

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<th>Course Number</th>
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<tbody>
<tr>
<td>202</td>
<td>Mechanics of Solids</td>
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**Veterinary Medicine**

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<tr>
<th>Course Number</th>
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<tbody>
<tr>
<td>638</td>
<td>The Microscope and Its Use</td>
</tr>
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**Rural Sociology**

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<tbody>
<tr>
<td>360</td>
<td>The Old Order Amish: Folk Society or Model for the Future?</td>
</tr>
<tr>
<td>437</td>
<td>Environment and Aging</td>
</tr>
</tbody>
</table>
New York State College of Veterinary Medicine

Announcement of the New York State College of Veterinary Medicine

to the degree of Master of Science, Doctor of Science engaged in one of the increasing number of other 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.

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. In exceptional cases, outstanding students who have completed all of the prerequisites in two years of undergraduate education may be considered for admission. 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.

Anatomy

500–501 Gross Anatomy 500, fall; 501, spring.
502 Developmental Anatomy and Cytology Fall.

Avian and Aquatic Animal Medicine

255 Poultry Hygiene and Disease Fall.
555 Avian Diseases Spring.
672 Aquavet: Introduction to Aquatic Veterinary Medicine Mid-May–mid-June.
770 Advanced Work in Avian Diseases Fall and spring.
771 Graduate Seminar in Diseases of Aquatic Animals Fall and spring.
772 Advanced Work in Aquatic Animal Diseases Fall and spring.

Clinical Sciences

475 Health and Diseases of Animals Spring.
500 Radiology Spring.
546 Clinical Orientation Fall.
547 Practice Management Experience at the Small Animal Hospital Fall and spring.
560 Clinical Methods Fall.
561–562 Obstetrics and Reproductive Diseases 561, spring; 562, fall.
563–564 Large Animal Medicine 563, fall; 564, spring.
565 Large Animal Surgery Spring.
566 Pathology Service Fall and spring.
567 Clinical Nutrition Fall.
568–569 Veterinary Medical Orientation 568, fall; 569, spring.
591 Small Animal Surgery Service Fall and spring.
592 Large Animal Surgical Techniques Spring.
593 Ophthalmology Service Fall and spring.
594 Large Animal Medicine Service Fall and spring.
595 Advanced Microbiology Fall and spring.
596 Opportunities in Veterinary Medicine Fall and spring.
597 General Surgery and Anesthesiology Fall.
598 Small Animal Medicine Service Fall and spring.
599 Small Animal Surgery Service Fall and spring.
600 Special Projects In Anatomy Fall and spring.
601 Advanced Anatomy Fall and spring.
602 Advanced Clinical Neurology Fall.

Microbiology

315 Basic Immunology, Lectures ((also Biological Sciences 305) Fall.
316 Basic Immunology, Laboratory (also Biological Sciences 307) Fall.
317 Pathogenic Microbiology Spring.
515 Veterinary Immunology Fall.
516 Veterinary Bacteriology and Mycology Fall.
517 Veterinary Virology Spring.
518 Infectious and Zoonotic Diseases Spring.
605 Special Projects in Microbiology Fall and spring.
606 Small Animal Infectious Diseases Spring.
706 Immunology Seminar Series Fall and spring.
707 Advanced Work In Bacteriology, Virology, or Immunology Fall and spring.
708 Animal Virology, Lectures and Laboratory Demonstrations Spring.
### Physiology

- **Biological Basis of Sex Differences (Biological Sciences 214)** Spring
- **Animal Reproduction and Development (Animal Sciences 220)** Fall
- **The Vertebrates (Biological Sciences 274)** Spring
- **Histology: The Biology of the Tissues (Biological Sciences 313)** Fall
- **Ecological Animal Physiology, Lectures (Biological Sciences 315)** Fall
- **Cellular Physiology (Biological Sciences 316)** Spring
- **Ecological Animal Physiology, Laboratory (Biological Sciences 317)** Fall
- **Introduction to Animal Physiology, Lectures (also Biological Sciences 311)** Fall
- **Introduction to Animal Physiology, Laboratory (also Biological Sciences 319)** Fall
- **Seminar in Anatomy and Physiology (Biological Sciences 410)** Fall and spring
- **Special Histology: The Biology of the Organs (Biological Sciences 412)** Spring
- **General Animal Physiology: A Quantitative Approach, Lectures (Biological Sciences 416)** Spring
- **General Animal Physiology, Laboratory (Biological Sciences 418)** Spring
- **Fundamentals of Endocrinology (Animal Sciences 427)** Fall
- **Mammalian Physiology (Biological Sciences 458)** Spring
- **Undergraduate Research in Biology (Biological Sciences 499)** Fall and spring
- **Veterinary Physiology I** Fall
- **Veterinary Physiology II** Spring
- **Veterinary Physiology III** Fall
- **Lipids (Biological Sciences 619 and Nutritional Sciences 602)** Fall
- **Veterinary Animal Behavior** Spring
- **Acid-Base Relations** Fall and spring
- **Graduate Research in Animal Physiology (also Biological Sciences 719)** Fall and spring
- **Special Projects in Physiology** Fall
- **Applied Electrophysiology (also Biological Sciences 617)** Fall
- **History of Physiology (Biological Sciences 712)** Spring
- **Farm Animal Behavior (Biological Sciences 713)** Fall
- **Plasma Lipoproteins (Biological Sciences 714)** Spring
- **Evolution of Color Vision (Biological Sciences 715)** Fall
- **Dependability of the Nervous Systems (Biological Sciences 716)** Spring
- **Fish as a Subject of Physiologic Inquiry (Biological Sciences 717)** Fall
- ** Nutritional Pathophysiology (Biological Sciences 718)** Spring
- **Special Problems in Physiology** Fall and spring
- **Physiology** Spring
- **Physiology** Fall
- **Radioisotopes in Biological Research (also Biological Sciences 616)** Fall
- **Biological Membranes and Nutrient Transfer (also Biological Sciences 618)** Fall
- **Mammalian Neurophysiology (also Biological Sciences 450)** Spring
- **Physiology Graduate Seminar** Fall
- **Molecular Mechanisms of Hormone Action (also Biological Sciences 658)** Spring

### Preventive Medicine

- **The Population Biology of Health and Disease** Spring
- **Medical Parasitology** Fall
- **Systematics and Bionomics of Animal Parasites** Fall and spring
- **Animal Parasitology** Fall
- **Diagnostic Parasitology** Fall
- **Veterinary Medical Orientation** Fall
- **Preventive Medicine in Animal Health Management** Spring
- **Veterinary Epidemiology** Fall
- **Safety Evaluation in Public Health (also Toxicology 660)** Spring
- **Data Processing in Preventive Medicine** Spring
- **Introduction to Epidemiology** Fall
- **Advanced Epidemiology** Fall
- **Advanced Work in Animal Parasitology** Fall and spring
- **Graduate Research** Spring
- **Immunoparasitology** Spring
- **Master's-Level Thesis Research** Fall and spring
- **Doctoral-Level Thesis Research** Fall and spring
- **Graduate Seminar** Fall and spring
- **The Biology of Parasitism** Spring
- **Independent Study** Spring
Faculty Roster

Appel, Max J., Ph.D., Cornell U. Prof., Microbiology.
Bell, Robin G., Ph.D., Australian National U. Asst. Prof., Microbiology.
Bergman, Emmett N., Ph.D., U. of Minnesota. Prof., Physiology.
Blue, Julia T., Ph.D., U. of Pennsylvania. Asst. Prof., Clinical Sciences.
Blue, Murray G., Ph.D., U. of California at Davis. Asst. Prof., Clinical Sciences.
Calnek, Bruce W., D.V.M., Cornell U. Prof., Avian and Aquatic Animal Medicine.
Campbell, S. Gordon, Ph.D., Cornell U. Prof., Microbiology.
Carmichael, Leiland E., Ph.D., Cornell U. John M. Olin Professor of Virology, Microbiology.
Casaret, Alison P., Ph.D., U. of Rochester, Rochester, Prof., Physiology.
Castelein, William L., Ph.D., U. of California at Davis, Asst. Prof., Physiology.
Cockrell, Gary L., Ph.D., Ohio State U. Assoc. Prof., Pathology.
Cooper, Barry J., Ph.D., U. of Sydney (Australia). Assoc. Prof., Pathology.
Corradino, Robert A., Ph.D., Cornell U. Assoc. Prof., Physiology/(Section of Physiology).
Cummings, John F., Ph.D., Cornell U. Prof., Anatomy.
Cypess, Raymond H., Ph.D., U. of North Carolina. Prof., Diagnostic Laboratory/Preventive Medicine/Microbiology.
DeLahunt, Alexander, Ph.D., Cornell U. Prof., Clinical Sciences/Anatomy.
Dobson, Alexandre, Ph.D., U. of Aberdeen (Scotland). Prof., Physiology/(Section of Physiology).
Evans, Howard E., Ph.D., Cornell U. Prof., Anatomy.
Fabricant, Julius, Ph.D., Cornell U. Prof., Avian and Aquatic Animal Medicine/Microbiology.
Fox, Francis H., D.V.M., Cornell U. Prof., Clinical Sciences.
Freig, G. Frederick, M.D., U. of Pennsylvania. Assoc. Prof., Diagnostic Laboratory.
French, Tracy W., D.V.M., Purdue U. Asst. Prof., Pathology.
Gasteiger, Edgar L., Jr., Ph.D., U. of Minnesota Prof., Physiology/(Section of Physiology).
Georgi, Jay R., Ph.D., Cornell U. Prof., Pathology/Preventive Medicine.
Gillespie, James H., M.D., U. of Pennsylvania, Prof., Microbiology.
Guard, Charles L. III, Ph.D. Case Western Reserve U. Asst. Prof., Clinical Sciences.
Hall, Charles E., D.V.M., Cornell U. Assoc. Prof., Clinical Sciences.
Hansel, William, Ph.D., Cornell U. Prof., Physiology/(Section of Physiology)/Animal Science.
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occupational, 53, 54
officer (ROTC), 340-46
physical, 8, 347-50
psychology of, 51, 52, 53, 54
See also Teaching
Educational Opportunity Program (EOP), 16, 26
Elasticity and waves, 273
Electrical engineering, 247, 251, 283-66, 352
Emergencies, 20
medical, 18
Empathy, Assistance, and Referral Service (EARS), 17
Empire State students, 292
Employee Assembly, 18-19
Employment, 26
of foreign students, 17
Endocrinology, 47
Energy, fluids, and aerospace engineering, 272-74
Engineering, 8
aerospace, 248-49, 270-74, 353
civil, 27, 31, 41-43, 244
and physical sciences facilities, 7
biological, 31, 41, 43
chemical, 245-46, 251, 254-65, 352
civil and environmental, 246, 256-61
College of, 242-80
academic standing, 244
administration, 242
advanced placement, 244
College Program, 243-44
common courses, 250-52
Cooperative Program, 244
cooperative program with business and public administration, 242
degree programs, 242
dual degree option, 244
facilities, 242
counseling, 278-80
Office of Undergraduate Affairs, 243
requirements for graduation, 242-43
transfer credit, 244
common courses, 250-52
drawing, 41, 250, 270
electrical, 247, 251, 263-66, 352
environmental quality, 258-59
highway, 42, 43
industrial operations research and; 249-50, 251, 274-77, 353
materials science and, 247-48, 251, 266-70
mechanics of materials, 149, 277
mechanical and aerospace, 248-49, 270-74, 353
nuclear science and, 249, 252, 274
operations research and industrial, 249-50, 251, 274-77, 353
physics applied and, 244-45, 252-54
structural, 259-60
Transportation, 259
English
as a second language, 153, 162, 353
Department of, 127-32, 205-6, 352
advanced placement in, 12, 13
Intensive English Program, 204
literature, 128, 129, 130, 131, 132, 146, 206, 215, 352
Enrollment
course, 20
statistics, 6
See also Registration: individual schools and colleges
Entomology, 27, 33, 55-57
honors program, 29-30
Environmental analysis, design and, 293, 305-9
Environmental conservation, 44, 64, 65, 66
Environmental design, 82-83, 92
Environmental engineering, 256-57
Environmental health, housing, and institutional planning, 90-91
Environmental law, 89-90, 256, 332
Environmental quality engineering, 256-59
Environmental studies, 31
Environmental technology, 27, 31
EOP (Educational Opportunity Program), 16, 26
Equal Opportunity, Office of, 5, 15
Ethnology, 104, 202
Ethology, 234, 352
European art, 144, 145, 148
European history, 139, 141, 142-43
European studies, concentration in, 133
Evolution, ecology, systematics, and, 222, 231-33
Examinations
advanced placement, 11-14
College Entrance Examination Board (CEEB), 11
College-Level Examination Program (CLEP), 11
College Placement Test (CPT), 12, 94, 95
Cornell Advanced Standing Examination (CASE), 13, 95
departmental advanced standing, 11
final, 21
preliminary, 21
Test of English as a Foreign Language (TOEFL), 94, 281
Armed Forces Institute, 11
See also Exams
tuition, 23
Excess hours tuition, 23, 297
Exchange programs. See individual schools and colleges
Expenses. See Tuition, fees, and expenses; Financial aid
Experimental mechanics, 277
Expository writing, 126, 130, 352
Extension courses (UL), 330-31
Extramural courses, 351
Facilities. 7. See also individual schools and colleges
Faculty Council of Representatives, 18-19
Faculty roster. See individual schools and colleges
FALCON (intensive language program), 107, 152, 159
Family studies, human development and, 250-94, 309-13, 353
Farm finance and management, 27, 38, 39
Farming, 37, 39, 41, 62
Fees and expenses
acceptance deposit, 24
to add/drop/change courses, 21
application, 24
billing and payment, 24
excess hours tuition, 23, 297
extramural courses, 23
late course enrollment, 21
late registration, 20
physical education, 347
refund policies, 24
tuition, 23
Fiction. See Literature
Field study (human ecology), 295, 301
Fieldwork. See individual schools and colleges, departments, and special programs
Film. See Cinema; Photography
Filmmaking, 6, 354
Films, 6
Final examinations, 21
Financial aid. 25
for foreign students, 17
minority students, 16
Fine arts. See Art. Design and environmental analysis, History of art
Fishery science, 64, 65-66, 232
Floriculture and ornamental horticulture, 27, 33-34, 35, 57-59
Fluid mechanics, 257, 271, 272, 273, 274
Film, 6, 354
Folk literature, 129
Food
beverage management, and, 287-88
chemistry, 60, 61, 290
industry management, 27, 39, 290
production, 60, 203, 287, 288
science, 27, 34-35, 59-61
toxology, 61
Foreign language requirement. See individual schools and colleges, departments, and special programs
Foreign languages. See specific language
Foreign students, 16-17
advanced standing, 11
Forestry, 64, 65
Fraternities. 19
French
language, 153-54, 289, 353
placement in, 13, 98
literature, 121, 148, 154-56, 354
advanced placement in, 13, 14
major, 153
See also Romance studies
Transportation, 79, 89
engineerings, 259
services, 20
Tuition, 23
billing and payment, information, 24
excess hours, 23
insurance, 24
New York State Tuition Assistance Program (TAP), 25
Turkish, 169, 173
Tutoring services
Interfraternity Council, 15
Learning Skills Center, 15
Writing Workshop, 15
Typewriting, 289, 353
Ugaritic, 174
Ukrainian, 169
Unclassified Students, Division of, 8, 26, 29
Undergraduate Research Program (arts and sciences), 97
Unions and Activities, Department of, 19
University Assembly, 18
University Health Services, 17, 18
University Hearing Board, 19
University, history of, 5
University resources, 6
University Services Bureau, 20
Urban and regional theory, 86
Urban development planning, 88-89, 90
Urban studies, 86, 89
Vegetable crops, 27, 36, 72
Veterinary Medicine, New York State College of, 354, 355-57
Video communication, 48, 49, 50, 352
Vietnamese, 169
Viticulture, 68
Vocational guidance, 16
Washington program, 78
Waste management, 43, 258
Water resources, 257, 260-61
Western Societies Program, 9
Wildlife science, 64, 65, 66
Willard Straight Hall, 19
Wine, 268
Winter session, 2
Withdrawal, 21. See also individual schools and colleges
foreign students, 17
Women’s studies, 103, 107, 118, 128, 129, 131, 134, 135, 139, 140, 141, 158, 183, 187, 189, 190, 193, 203, 204, 205, 214-16, 225, 310, 328
Writing, 48, 49, 50, 51, 186, 184, 200, 203, 205, 206, 214, 262, 354
business, 49, 50, 241, 289, 290
creative, 129, 130, 131, 352
expository, 128, 130, 352
news, 49
scientific, 48, 49, 50, 352
Workshop, 15, 208, 352
Yiddish, 173
Young Israel, 18
Zoology, 225