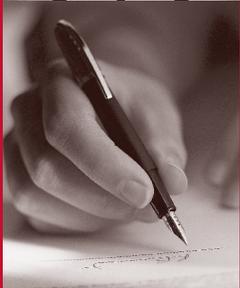


2009–2010

COURSES of Study

Cornell University



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Cornell University has an enduring commitment to support equality of education and employment opportunity by affirming the value of diversity and by promoting an environment free from discrimination. Association with Cornell, either as a student, faculty, or staff member, involves participation in a free community where all people are recognized and rewarded on the basis of individual performance rather than personal convictions, appearance, preferences (including sexual or affectional orientation), or happenstance of birth.

Cornell University's history of diversity and inclusion encourages all students, faculty, and staff to support a diverse and inclusive university in which to work, study, teach, research, and serve. No person shall be denied admission to any educational program or activity or denied employment on the basis of any legally prohibited discrimination involving, but not limited to, factors such as race, color, creed, religion, national or ethnic origin, gender, sexual orientation, age, gender identity or expression, marital status, disability, or veteran status. Cornell University is an affirmative action, equal opportunity employer.

Concerns and complaints related to equal opportunity in education and employment based on aspects of diversity protected under federal, state, and local law, including sexual harassment complaints filed by any member of the Cornell community against an academic or nonacademic staff member, as well as complaints arising under Title IX, should be directed to the Office of Workforce Diversity, Equity and Life Quality (WDELQ), 160 Day Hall, Ithaca, NY 14853-2801 (telephone: 607-255-3976; fax: 607-255-7481; TDD: 607-255-7066; e-mail equalopportunity@cornell.edu).

Cornell University is committed to assisting those persons with disabilities who have special needs related to their educational pursuit or employment. Information on services provided to prospective and current Cornell students with disabilities can be obtained by contacting Student Disability Services, Center for Learning and Teaching, 420 Computing and Communications Center, Ithaca, NY 14853-6601 (telephone: 607-254-4545; facsimile: 607-255-1562; TDD: 607-255-7665, www.clt.cornell.edu). Prospective employees in need of workplace accommodation for participation in the selection process should contact WDELQ. Current employees in need of a workplace accommodation pursuant to the Americans with Disabilities Act or New York State law should contact Medical Leaves and Administration, 840 Hanshaw Rd., Ithaca, NY 14850 (telephone: 607-216-1400, fax: 607-216-1425).

All members of the Cornell Community are encouraged to report bias activity, including hate crimes, either experienced directly or observed to WDELQ. They may also report the matter to a bias reporting team member (www.cornell.edu/diversity/biasreport.cfm).

Members of the Cornell University community are strongly encouraged to report immediately any criminal activity and suspicious person(s) to the Cornell University Police Department (607 255-1111). Incidents that may or may not be crimes may also be reported to "campus security authorities," which include, in addition to the Cornell University Police, those with responsibility for controlling access to buildings or facilities and officials having significant responsibility for students or campus activities. Licensed counselors and campus clergy (pastoral counselors) are exempt from reporting requirements. Cornell University encourages counselors and clergy, if and when they deem it appropriate, to inform those who they counsel of procedures for reporting crimes on a voluntary, confidential basis for inclusion in the Cornell University Police Statistical Crime Record.

For Cornell University directory information or general information, call 607 255-2000 or 607 254-INFO. Courses of Study is available on the web at cornell.edu/academic/courses/cfm.

To obtain a copy of this catalog, please follow these guidelines:

If you are a prospective undergraduate student and don't have web access, please contact the Undergraduate Admissions Office, Cornell University, 410 Thurston Ave., Ithaca, NY 14850-2488, 607 255-5241.

If you are a prospective graduate student, please consult the listing of the course catalog on the web (see above for address).

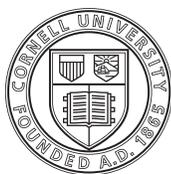
If you are a currently enrolled student, please consult the listing of the course catalog on the web (see above for address) or contact your college registrar.

All others please contact the Office of the University Registrar, Cornell University, B07 Day Hall, Ithaca, NY 14853-2801, 607 255-4232, e-mail: dtsy1@cornell.edu

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Cornell University

Courses of Study

2009–2010

Accreditation

Cornell University is accredited by the Middle States Commission on Higher Education.

A copy of the most recent reaffirmation of Cornell's accreditation can be found at dpb.cornell.edu/accreditation.htm. Requests to review additional documentation supporting Cornell's accreditation should be addressed to Marin Clarkberg, Associate Director, Institutional Research and Planning, Cornell University, 441 Day Hall, Ithaca, NY 14853-2801, mec30@cornell.edu.

Cornell University

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Key

- M Monday
- T Tuesday
- W Wednesday
- R Thursday
- F Friday
- S Saturday
- S-U Satisfactory-Unsatisfactory
- disc discussion
- lab laboratory
- lec lecture
- rec recitation
- sec section
- TBA to be announced/to be arranged
- @ geographic breadth
- # historical breadth
- Courses with names and descriptions enclosed in brackets—[]—are not offered fall 2009 and spring 2010.
- All area codes are 607 unless otherwise specified.

CORNELL UNIVERSITY—GENERAL INFORMATION

Introduction

Courses of Study (www.cornell.edu/academics/courses.cfm), a catalogue of Cornell University's many academic programs and resources, contains information about colleges and departments, interdisciplinary programs, undergraduate and graduate course offerings, and procedures. Students also should consult with their college's advising office for specific information on their college's academic policies and procedures, degree programs, and requirements. Not included in this publication is information concerning the Medical College and the Graduate School of Medical Sciences, located in New York City.

It is not possible to keep this single volume completely up-to-date. The most current information regarding course descriptions, schedules, sections, rooms, credits, and registration procedures may be found at www.cornell.edu/academics/courses.cfm, which also includes the Course and Time/Room Rosters. Students are also advised to consult individual college and department offices for up-to-date course information.

Cornell community members are expected to comply with all university policies, including the Code of Conduct and the Code of Academic Integrity available at www.policy.cornell.edu.

The following are offices and sources of information about admission to Cornell University.

Undergraduate Admissions Office, 410 Thurston Avenue, Ithaca, NY 14850-2488, 255-5241, admissions.cornell.edu.

Graduate School, 143 Caldwell Hall, Ithaca, NY 14853-2602, 255-5820, gradschool.cornell.edu, gradschool@cornell.edu.

Law School, Myron Taylor Hall, Ithaca, NY 14853-4901, 255-5141, www.lawschool.cornell.edu/admissions, lawadmit@lawschool.cornell.edu.

Samuel Curtis Johnson Graduate School of Management, Office of Admissions, 111 Sage Hall, Ithaca, NY 14853-6201, 255-4526, www.johnson.cornell.edu.

College of Veterinary Medicine, Office of Student and Academic Services, Cornell University, S2009 Schurman Hall, Ithaca, NY 14853-6401, 253-3700, www.vet.cornell.edu/prospective.htm.

Weill Cornell Medical College, Office of Admissions, 445 E. 69th Street, New York, NY 10021, 212-746-1067, www.med.cornell.edu/education/admissions, wcmc-admissions@med.cornell.edu.

Graduate School of Medical Sciences of Cornell University, Office of Admissions, 445 E. 69th Street, New York, NY 10021, 212-746-6565, www.biomedsci.cornell.edu, wgms@med.cornell.edu.

University Registration

University registration is the official recognition of a student's relationship with the university and is the basic authorization for a student's access to services and education. Completion of registration is essential to enable the university to plan for and provide services and education, guided by the highest standards for efficiency and safety. Unauthorized, unregistered persons who use university services and attend classes have the potential to use university resources inappropriately and to displace properly registered students. In addition, the university assumes certain legal responsibilities for persons who participate as students in the university environment. For example, policy states that New York State health requirements must be satisfied. Because these requirements are intended to safeguard the public health of students, the university has a responsibility to enforce the state regulations through registration procedures.

The policy on university registration is intended to describe clearly the meaning of and the procedures for registration so that students can complete the process efficiently and be assured of official recognition as registered students. With the clear communication of the steps for registration, it is hoped that compliance will occur with a minimum of difficulty.

To become a registered student at Cornell University, a person must

- complete course enrollment according to individual college requirements;
- settle all financial accounts, including current semester tuition;
- satisfy New York State and university health requirements;
- have no holds from their college, the Office of the Judicial Administrator, Gannett Health Services, or the bursar.

Individuals must become registered students by the end of the third week of the semester or their access to services and education will be terminated and they will be subject to a \$350 late fee, then \$25 per week after the sixth week plus any finance charges.

Cornell University does not allow persons who are not registered with the university in a timely manner to attend classes, reside in university-owned residences, or use any other university services. The university reserves the right to require unauthorized, unregistered persons who attend classes or in other ways seek to exercise student privileges to leave the university premises. The university does not permit retroactive registration and does not record courses or grades for unregistered persons.

LEAVES AND WITHDRAWALS

Students wishing to take a leave from their college are required to apply for a voluntary Leave of Absence (LOA) with an expected

return date. Students who do not apply for and receive approval for a LOA will be automatically withdrawn from the university following the fifth week of the semester and may be required to apply for readmission. Withdrawn students and students on a LOA may not enroll in course work with the university (e.g., extramural studies, summer/winter session). Students on a LOA are not eligible for privileges afforded to full-time registered students, including housing, dining, library, and transit privileges.

Students may withdraw from the university at their own discretion. In addition, a college may withdraw a student who fails to return at the end of a period of authorized leave.

Medical leaves are granted by the student's college upon recommendation by Gannett Health Services.

Bursar Information

TUITION, FEES, AND EXPENSES

Tuition for Academic Year 2009–2010

Endowed Divisions

Undergraduate

Architecture, Art, and Planning	
Arts and Sciences	
Engineering	
Hotel Administration	\$37,750

Graduate

Graduate School (with chair in an endowed college)	\$29,500
Johnson Graduate School of Management Two-Year Program	
entering students	\$47,150
second-year students	\$46,700

Professional

Law School	
entering and second-year students	\$48,950
third-year students	\$48,050
LL.M. one-year program students	\$51,530

Contract Divisions (tuition rates are tentative)

Undergraduate

Agriculture and Life Sciences	
Human Ecology	
Industrial and Labor Relations	
New York State resident*	\$21,610
Nonresident	\$37,750

Graduate and Professional Students

Graduate School (with chair in a contract college)	\$20,800
Veterinary Medicine	
New York State resident DVM	\$26,500
Nonresident DVM	\$39,500
Graduate, Ph.D.	\$20,800

Student Activities Fee (Tentative)

Undergraduate students	\$204
Graduate and professional students	\$70

Summer Session (2009) \$970
per credit**

In Absentia Fees

Undergraduate \$200 per semester
Graduate and professional \$200 per semester
Law and management \$75 per semester

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

* **Residency status** is determined at the time of admission by the college. Change in residency status is determined by the university bursar following matriculation. The deadline for submission of requests for the Fall 2009 semester is June 1, 2009. The deadline for the Spring 2010 semester is November 1, 2009. Further information and an application can be found at www.bursar.cornell.edu.

****Regular session rate.** Special program rates may vary.

Admission application fees and forms may be found at www.cornell.edu/admissions.

Tuition Refund Policy

Amounts personally paid for tuition may be refunded if the student requests a leave of absence or withdrawal from the office of the dean of his or her college of enrollment. The date of this request will determine the tuition liability for the semester. All students refer to the "Proration Schedule for Withdrawals and Leaves of Absence" below.

Repayment policy. Students receiving financial aid from the university who withdraw during a semester 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. Cornell is authorized to offset any credit balances against any debts owed by the student to the university.

Proration Schedule for Withdrawals and Leaves of Absence

Fall 2009 and Spring 2010

Percentage	All Students	
	Fall 2009	Spring 2010
no charge	8/27-9/2	1/25-1/31
10% charge	9/3-9/9	2/1-2/7
20% charge	9/10-9/23	2/8-2/21
30% charge	9/24-9/30	2/22-2/28
40% charge	10/1-10/7	3/1-3/7
50% charge	10/8-10/14	3/8-3/14
60% charge	10/15-10/21	3/15-3/21
80% charge	10/22-10/28	3/22-3/28
100% charge	10/29	3/29

Special programs, such as Cornell Abroad and Executive MBA, may follow their own tuition refund policies for withdrawals and leaves of absence. Please refer to the appropriate program office for details regarding those policies.

BILLING AND PAYMENT

Billing

Electronic billing (E-billing) is the official method of billing. Paper bills will not be sent. Tuition and room and board charges will be billed in July and December and must be paid before registration. The due date for these semester bills will normally be 5 to 10 working days before registration day. All other charges, credits, and payments will appear on monthly statements.

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

The Office of the Bursar conducts all business directly with the student. Monthly charges, as well as any awards, grants, scholarships, and loans, are listed and billed under the student's name. Refund checks and direct deposit refunds are also drawn in the name of the student. Cornell is also authorized to offset any credit balances against any debts owed by the student to the university.

Payments

An individual who has outstanding indebtedness to the university will not be allowed to register or reregister in the university, receive a transcript of record, have academic credits certified, be granted a leave of absence, or have a degree conferred. University policy precludes the use of any current financial aid for payment of past-due charges.

The Office of the Bursar acts as a clearinghouse for student charges and credits that are placed directly on a student's bill by several departments and offices of the university. *Because 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 (tel. 255-2336; fax 255-6442; uco-bursar@cornell.edu; www.bursar.cornell.edu). Bursar account information may be viewed real time on *Student Center*.

Student Health Insurance

Because of the high cost of medical care, it is Cornell University policy that every full-time registered student must have health insurance coverage.

The Student Health Insurance Plan (SHIP) is developed especially for Cornell students and provides extensive coverage at a reasonable cost for most on- or off-campus medical care. Complete and current details of the SHIP, its cost, and population-specific material for undergraduates, graduate students, and professional students are mailed to each student

in July. Undergraduates, graduate students, and professional students each have separate deadlines and guidelines. Please be sure to check the July mailing for complete details.

The Student Health Insurance Plan provides coverage 24 hours a day, 365 days a year, anywhere in the world. Students graduating midyear may be eligible to purchase the Early Grad Plan. Those enrolled in the SHIP may enroll their eligible dependents for an additional cost (fall deadline: September 30). Graduate and professional students who prefer to pay monthly must enroll in the installment payment plan no later than September 30. Because of policy restrictions, the plan is nonrefundable (except for dependents who no longer meet eligibility requirements and students who withdraw from Cornell within the first 30 days of the academic year).

For more information, students should contact Cornell University Office of Student Health Insurance, 409 College Avenue, Suite 211 (tel. 255-6363; sicu@cornell.edu; www.studentinsurance.cornell.edu).

Student Record Privacy Statement: Annual Notification Under FERPA

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. Further details may be found in Cornell Policy 4.5 Access to Student Information, available at www.policy.cornell.edu/Vol.4_5.cfm. These rights include:

1. The right to inspect and review the student's education records within 45 days of the day the university receives a request for access.

Students should submit to the office of the university registrar, written requests that identify the record(s) they wish to inspect. The university official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the university official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

2. The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent:
 - a. Disclosure to school officials with legitimate educational interests. A school official is a person employed by the university in an administrative, supervisory, academic (including emeritus faculty), research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the university has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

A school official has a legitimate educational interest if the official needs to review an education record to fulfill his or her professional responsibility.

- b. Upon request, to officials of another school in which a student seeks or intends to enroll.
- c. To parents or legal guardians of dependent students as that term is defined in the Internal Revenue Code. In general, the university does not make education records available to the parents of a student. However, where the university believes that it is in a dependent student's best interest, information from the student's education records may, at the university's discretion, be released to the parents or legal guardians of such a dependent student. Such disclosure generally will be limited to information about a student's official status at the university, but parents or legal guardians of a dependent student may also be notified upon the authorization of the dean of the student's college, or the Vice President for Student and Academic Services, or the Dean of Students, or their designees in the following cases:
 - when a student has voluntarily withdrawn from the university or has been required by the university to withdraw;
 - when a student has been placed on academic warning;
 - when the student's academic good standing or promotion is at issue;
 - when a student engages in alcohol- or drug-related behavior that violates Cornell policies;
 - when a student has been placed on disciplinary probation or restriction.
 - in exceptional cases when a student otherwise engages in behavior calling into question the appropriateness of the student's continued enrollment in the university.

Unless otherwise indicated in writing by the student at the time of registration, or thereafter, the university will presume that a full-time undergraduate student is a dependent as that term is defined in the Internal Revenue Code. Undergraduate students who are not financially dependent and do not wish to permit their parents or legal guardian access to their education records should advise the Office of the University Registrar in writing and provide evidence of financial independence. Graduate and professional students are not assumed to be financially dependent upon their parents or legal guardian for these purposes.

- d. Disclosure of directory information. Cornell University has defined directory information to include the following: name, local address, local telephone listing, e-mail address, photograph, major field of study and college attended, dates of attendance, enrollment status, participation in officially recognized activities and sports, weight and height (of members of athletic teams) and any degrees earned and awards received. Directory information may be released unless the student updates his/her privacy settings on *Student Center*. Students who

wish to suppress their directory information from the printed telephone directory must perform this update within 10 days of the date of official university registration. Students may rescind their no-release request at any time by writing to the Office of the University Registrar or on *Student Center*.

3. The right to request the amendment of the student's education record that the student believes is inaccurate.

Students may ask the office of the university registrar to amend a record that they believe is inaccurate. They should write the university official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate.

If the university decides not to amend the record as requested by the student, the university will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by Cornell University to comply with the requirements of FERPA. The name and address of the office that administers FERPA is:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW
Washington, DC 20202-5901

Financial Aid and Federal Loans Satisfactory Academic Progress Policy for Undergraduate Students

Federal regulations (General Provision CRF 668.1) require that Cornell University review the academic progress of students who apply for and/or receive financial assistance. This includes but is not limited to the William D. Ford Federal Direct Loan program and all Cornell grants. To be making satisfactory academic progress toward a degree, students must maintain specified grade point averages and proceed through the program at a pace leading to completion within a specified time frame. This regulation applies to each financial aid applicant, whether a previous aid recipient or not. Failure to make satisfactory academic progress may affect your eligibility for financial aid. The specific requirements for GPA and credit hours can be found by reviewing the complete policy on the Office of Financial Aid and Student Employment web site, finaid.cornell.edu.

Academic Integrity

Absolute integrity is expected of every Cornell student in all academic undertakings. Any fraudulent act by a student to advance his or her academic status merits a severe penalty and such cases are governed by the Code of

Academic Integrity. A pamphlet titled the *Code of Academic Integrity and Acknowledging the Work of Others* is available from the office of the dean of faculty, and at www.policy.cornell.edu/Code_of_Academic_Integrity.cfm.

Protection of Human Participants in Research

The Human Research Protection Program is designed to assure the safety and well-being of individuals who participate in research projects at Cornell University. Research activities covered by the Human Research Protection Program include, but are not limited to, experiments and psychological or physical tests on humans, surveys, questionnaires, and studies of existing data, documents, or records in which there are individual identifiers. To help faculty, students, and staff members determine if an activity or project falls under the purview of Cornell's Human Research Protection Program, the Office of Research Integrity and Assurance (ORIA) has developed a Decision Tree, available at www.irb.cornell.edu.

The Institutional Review Board for Human Participants (IRB) is the official review board for all university projects that seek to use humans as research participants, assuring compliance with university policy and federal regulations protecting human subjects in research at universities. All proposals involving human participants in any category, including those initiated by students, must be submitted to the IRB for review before any research activities begin. Only after receiving an approval letter from the IRB, or an Exemption from IRB Review by ORIA, may a project be initiated. The guidelines for the use of human participants in research are available at www.irb.cornell.edu. Inquiries and communications about the guidelines should be directed to the IRB administrator (255-5138; irbhp@cornell.edu).

Use of Animals for Courses

Vertebrate animals serve as an invaluable aid in instruction. It is recognized, however, that some students have ethical objections to the use of vertebrate animals in this manner. Courses that use vertebrate animals are identified as such in the course descriptions. Students who have concerns about the use of animals in these courses should consult the course instructor for more information about the precise ways in which the animals are used. A set of university guidelines on the use of vertebrate animals in teaching for faculty and students is printed below and is available from departments in which the courses are offered. The use of live vertebrates in instruction is reviewed and approved by the Institutional Animal Care and Use Committee (IACUC) (www.iacuc.cornell.edu).

Cornell's Animal Users Health and Safety Program (AUHSP) covers faculty, staff, students, visiting scholars, contractors, and volunteers who have direct or indirect exposure to Cornell-owned vertebrate research and training animals. Program requirements are based on the type and frequency of exposure to animals, animal tissues, and/or time spent in an animal care facility (e.g., working, visiting, doing

maintenance work). Students enrolled in courses utilizing vertebrate animals are required to fill out a Risk Assessment Form (www.oria.cornell.edu/AUHSP/documents/AUHSPRiskAsstForm.pdf) and enroll in the AUHSP. Additionally, students should contact the Occupational Medicine Office of Gannett Health Services, or their personal health care provider, before working with animals or entering an animal facility, if they may have any medical conditions that may increase their risk.

Background: On December 8, 1987, the Cornell University Institutional Animal Care and Use Committee approved a series of guidelines recommended to them by the University Animal Welfare Committee. These guidelines were prepared by a subcommittee of faculty members, after they had the opportunity to evaluate the use of animals in undergraduate teaching (and student concerns for the same) from a representative sample of instructors.

Guidelines

1. For demonstrating certain principles and procedures, the use of animals in teaching is recognized as an invaluable, often essential, pedagogical device.
2. For courses in which vertebrate animals are to be used in dissection, surgery, or in other experimental procedures, the course description that appears in *Courses of Study* should alert students to this fact.
3. A detailed description of the intended use of vertebrate animals should be available to students upon request to the instructor of each course.
4. Faculty members are encouraged to explain their reasons and need for using vertebrate animals and should indicate to students the availability of the procedures described in item 8 below.
5. Students are encouraged to discuss their concerns about the instructional use of vertebrate animals with the instructor of the course.
6. When consistent with pedagogical objectives, faculty members are encouraged to consider adopting alternative methods and procedures that do not involve the use of live animals.
7. When students object on ethical or other valid grounds to participating in an exercise using vertebrate animals, instructors are encouraged to provide alternative means when consistent with pedagogical objectives for learning the same material.
8. A student who is reluctant to voice his or her concerns about animal use in a particular course or who thinks these concerns have not received proper attention may seek assistance from the chair of the Institutional Animal Care and Use Committee (IACUC) at 255-3749 or by e-mail at iacuc-mailbox@cornell.edu. Confidential reports may be made to http://secure.ethicspoint.com/domain/en/report_custom.asp?clientid=6357.
9. Faculty members should instruct students in the responsible use of animals. For more information, see www.policy.cornell.edu/vol1_4.cfm.

Advanced Placement

Definition and Purpose of Advanced Placement Credit

Advanced placement credit is college credit that students earn before they matriculate as freshmen and that counts toward the degree and degree requirements as specified by the individual college at Cornell. Its primary purpose is to exempt students from introductory courses and to place them in advanced courses. Its value is that it allows students to include more advanced courses in their course of study.

Sources of Advanced Placement Credit

Advanced placement credit may be earned from the following:

1. The requisite score from the Advanced Placement Examinations (AP exams) from the College Entrance Examination Board (CEEB) in Princeton, N.J. The requisite scores, which vary by subject, are determined by the relevant departments at Cornell and are listed on pages 9–10.
2. Acceptable performance on a Cornell department exam (offered only in some subjects, usually during orientation).
3. A regular course taught at an accredited college to college students and approved by the relevant department at Cornell. Some departments accept credit from virtually all accredited colleges; some do not.
4. GCE Advanced Level and International Baccalaureate Examinations are listed on page 11.

Note: *Cornell University does not accept credit for courses sponsored by colleges but taught in high schools to high school students, even if the college provides a transcript of such work.*

Students who have taken such courses may, however, earn credit by taking an appropriate examination as described in paragraph 1 or 2 above.

The appropriate department of instruction within the university sets the standards of achievement that must be met for advanced placement in its subject, recommends Advanced Placement credit for those who meet the standards, and determines which Cornell courses the credit places students out of. The final decision for awarding advanced placement credit at Cornell and applying it to degree requirements rests with each individual college (consult the relevant college sections of *Courses of Study*). Students need not accept advanced placement, although forfeiting the advantage of moving quickly into advanced courses affects one's overall education. If they take the Cornell course they have placed out of, they relinquish the advanced placement credit.

Advanced placement examinations.

Entering first-year students should have their scores from CEEB Advanced Placement Examinations sent to their college or school registrar's office (see list below).

Departmental advanced standing examinations.

In certain subjects, students may also qualify for advanced placement or credit, or both on the basis of departmental examinations given on campus during Orientation Week. A schedule of these examinations appears in the orientation booklet mailed in late summer to entering

students. The departments that award advanced placement and credit on the basis of departmental examinations are shown on pages 9–12. Students need to register for those examinations in the relevant department.

Transfer of credit. Entering first-year students who have completed college courses for which they want to receive credit toward their Cornell degree should send transcripts and course syllabi to their college or school office (see the list below).

Written inquiries. Students can address questions to departments, schools, or college offices by adding Ithaca, NY 14853 to the addresses given in the following sections.

College of Agriculture and Life Sciences
140 Roberts Hall

College of Architecture, Art, and Planning
B1 West Sibley Hall

College of Arts and Sciences
55 Goldwin Smith Hall

College of Engineering
158 Olin Hall

School of Hotel Administration
180 Statler Hall

College of Human Ecology
145 Martha Van Rensselaer Hall

School of Industrial and Labor Relations
101 Ives Hall

CREDIT AND PLACEMENT

The tables on the following pages summarize how credit and placement are determined for most subjects. Supplementary information for some subjects is also provided.

International Credentials

The policies currently in effect for General Certificate of Education (GCE) "A" Level Examinations and International Baccalaureate Higher Level Examinations are summarized in the table on pages 9 and 10. Students may submit results of the French Baccalaureat or German Abitur for possible credit depending on the stream or specialization followed. Accepted students holding any other secondary school credentials are urged to sit for the Advanced Placement Examinations of the College Entrance Examination Board or for the departmental examinations offered during Orientation Week.

The table lists subjects and the marks for which credit will be awarded.

CEEB's AP Exams

<i>Subject</i>	<i>Score</i>	<i>Advanced Placement (AP) Credit</i>	<i>Placement</i>
Arabic			Department of Near Eastern Studies determines credit and placement based on departmental examination.
Biology			see www.biology.cornell.edu for credit and placement information.
Chemistry	5	4 credits	Department determines placement on basis of student/advisor meeting before registration and/or an exam given during fall orientation. Placement out of 2070, 2080, or 2090; if students take 2150 they may also receive 4 AP credits. Pre-med students with AP credit should contact the Health Careers Center to determine how many general chemistry courses they should take. A few medical schools require two semesters of general chemistry; they do not accept AP credit as one of the required courses.
Computer science AB	4,5	4 credits	Placement out of CS 1110. Department offers placement exam during fall orientation.
Computer science A	5	4 credits	Placement out of CS 1110. Department also offers placement exam during fall orientation.
Economics, micro	4,5	3 credits	Placement out of ECON 1110 and HADM 1141.
Economics, macro	4,5	3 credits	Placement out of ECON 1120.
English literature and composition			varies by college
English language and composition			varies by college
Environmental science	4,5	3 credits	Placement out of EAS 1101 and NTRES 2010. (Engineering and BEE students receive no credit.)
French language	4,5	3 credits	Department of Romance Studies determines placement. Students should take the CASE† to obtain appropriate placement.
French literature	4,5	3 credits	Department of Romance Studies determines placement. Students should take the CASE† to obtain appropriate placement.
German	4,5	3 credits	Department of German Studies determines credit and placement. Students should take the CASE† to obtain appropriate placement.
Government and politics, U.S.	4,5	3 credits	Placement out of GOVT 1111.
Government and politics, comparative	4,5	3 credits	Placement out of GOVT 1313.
Greek, Ancient			Department of Classics determines credit and placement based on departmental examination.
Greek, Modern			Department of Classics determines credit and placement based on departmental examination.
Hebrew			Department of Near Eastern Studies determines credit and placement based on departmental examination.
American history	4,5	4 credits	Placement out of HIST 1530 (also AMST 1530) and 1531 (also AMST 1531).
European history	4,5	4 credits	Placement out of HIST 1510 and 1520.
Human geography		no credit	
Italian language	4,5	3 credits	Department of Romance Studies determines placement. Students should take the CASE† to obtain appropriate placement.
Italian literature	4,5	3 credits	Department of Romance Studies determines placement. Students should take the CASE† to obtain appropriate placement.
Latin			Department of Classics determines credit and placement based on departmental examination.

CEEB's AP Exams *(continued)*

<i>Subject</i>	<i>Score</i>	<i>Advanced Placement Credit</i>	<i>Placement</i>
Mathematics BC	4,5	8 credits	Placement out of MATH 1106, 1110, 1120, 1220, and 1910. Permission to take MATH 2210, 2230, 2130, or 2310. Students wishing to take engineering calculus will place into MATH 1920.
	3	4 credits	Placement out of MATH 1106 and 1110. Permission to take MATH 1120, 1220, 1910, or 2310.
Mathematics AB or AB subscore of BC exam	3,4,5	4 credits	Placement out of MATH 1106 and 1110. Permission to take MATH 1120, 1220, 1910, or 2310.
Music			Department of Music determines credit and placement based on departmental examination.
Persian			Department of Near Eastern Studies determines credit and placement based on departmental examination.
Physics B	5	8 credits	Placement out of PHYS 1101-1102. Students who also have a score of 4 or 5 on Mathematics BC may choose to accept 4 AP credits for 2207 or 1112 and then take 2208 or 2213. Students in the College of Engineering should refer to www.engineering.cornell.edu/student-services/academic-advising/academic-information/ap-credit/index.cfm for credit and placement information.
	4	4 credits	Placement out of PHYS 1101. (Students may receive credit for only one of the courses in each group: [PHYS 1101, 1112, 1116, 2207] OR [PHYS 1102, 2208, 2213, 2217].)
Physics C-Mechanics	4,5	4 credits	Placement out of PHYS 1112 or 2207, or placement into PHYS 1116 with no AP credit. For more information, contact department representative. (Students may receive credit for only one of the courses in each group: [PHYS 1101, 1112, 1116, 2207] OR [PHYS 1102, 2208, 2213, 2217].)
Physics C-Electricity/Magnetism	5	4 credits	Placement out of PHYS 2213. (Students may receive credit for only one of the courses in each group: [PHYS 1101, 1112, 1116, 2207] OR [PHYS 1102, 2208, 2213, 2217].)
Psychology	4,5	3 credits	Placement out of PSYCH 1101.
Spanish language	4,5	3 credits	Department of Romance Studies determines placement. Students should take the CASE† to obtain appropriate placement.
Spanish literature	4,5	3 credits	Department of Romance Studies determines placement. Students should take the CASE† to obtain appropriate placement.
Statistics (excluding engineering students)	4,5	4 credits	Placement out of AEM 2100, PAM 2100, ILRST/STSCI 2100, or MATH 1710 (not HADM 2201).
Studio art		no credit	
Turkish			Department of Near Eastern Studies determines credit and placement based on departmental examination.
World history		no credit	

†Cornell Advanced Standing Examination. Contact Callean Hile, 303 Morrill Hall, for French, Italian, and Spanish. Contact Miriam Zubal, 183 Goldwin Smith Hall, for German.

Subject	Marks	Credit
International Baccalaureate (IB) Higher-Level Examinations are awarded advanced standing and credit on receipt of the examination results from the I.B. Office.		
Anthropology		subject to departmental review
Biology		see www.biology.cornell.edu
Chemical and Physical Systems	6 or 7	8 credits (PHYS 1101 and 1102)
Chemistry	6 or 7	4 credits (CHEM 2070 or 2090)
Computer Science	6 or 7	4 credits (CS 1110)
Economics	6 or 7	6 credits (ECON 1110 and 1120)
English Literature	7	3 credits and placement out of one first-year writing seminar
	6	3 credits (excluding Arts and Sciences students)
History	6 or 7	4 credits
Mathematics	6 or 7	4 credits and placement out of MATH 1106 and 1110. Students may obtain more credit by taking the Mathematics Department placement exam during orientation week. (Engineering and BEE students receive no credit.)
Music		by departmental examination
Philosophy	7	subject to department review
Physical Science	6 or 7	8 credits (4 credits, CHEM 2060; 4 credits, PHYS 1010)
Physics	6 or 7	4 credits (PHYS 1101, 1112, or 2207). (Students may receive credit for only one of the courses in each group: [PHYS 1101, 1112, 1116, 2207] OR [PHYS 1102, 2208, 2213, 2217].)

General Certificate of Education (GCE) Advanced (“A”) Level Examination are awarded advanced standing and credit. Students must present the original or a certified copy of their examination certificate to receive credit.

Biology	see www.biology.cornell.edu	
Chemistry	A	8 credits (CHEM 2070 or 2090 and 2080)
	B	4 credits (CHEM 2070 or 2090)
Economics	A	6 credits (ECON 1110 and 1120)
English Literature	A	3 credits and placement out of one first-year writing seminar
	B	3 credits (excluding Arts and Sciences students)
Mathematics	A, B, or C	4 credits and placement out of MATH 1106 and 1110. Students may obtain more credit by taking the Mathematics Department placement exam during orientation week. Students who take the A level exam in Singapore will receive 8 credits and placement out of MATH 1106, 1110, 1120, 1220, and 1910. (Engineering and BEE students receive 4 credits.)
		4 additional credits for PHYS 2213 are granted for a combination of grades of A or B and a minimum of 8 advanced placement or advanced standing credits in mathematics. Students planning to major in physics are encouraged to enroll in PHYS 1116. Students taking 1116 do not receive 4 credits for 1112. Students taking 2217 do not receive credit for 2213. Students in the College of Engineering should refer to www.engineering.cornell.edu/student-services/academic-advising/ap-credit/index.cfm for credit and placement information.
Music		by departmental examination
Philosophy	A or B	subject to department review
Physics	A or B	4 credits for PHYS 1101, 1112, or 2207.

SUPPLEMENTARY INFORMATION

Chemistry and Chemical Biology

The Department of Chemistry and Chemical Biology offers two 8-credit sequences that satisfy prerequisites for further work in the department: CHEM 2070–2080 (2090 for engineering students) and 2150–2160. CHEM 2150–2160 is intended for students with a solid background in chemistry and strong math skills.

Freshmen may qualify for advanced placement and advanced standing credits in chemistry by satisfactory performance on the CEEB Advanced Placement Examination or an international examination, or by passing an advanced standing examination offered by the department. A score of 5 on the CEEB examination entitles a student to 4 credits. A student may earn 4 or 8 credits by suitable performance on the departmental examinations. To take the departmental

examinations (exams are offered at the beginning of each semester), students must sign up beforehand in the Chemistry and Chemical Biology Office of Undergraduate Studies, 131 Baker Laboratory, or online at www.chem.cornell.edu/cref/advplreg.aspx.

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 advisor, and the professors teaching the courses. Questions may also be directed to the director of undergraduate studies, in G50 Baker Laboratory. Students receiving advanced placement who are interested in a major in chemistry or a related science should consider taking CHEM 2150–2160 and should consult the CHEM 2150 instructor or department staff.

Computer Science

Students who receive a score of 4 or 5 on the AB version of the CEEB Advanced Placement

Examination in computer science, a score of 5 on the A exam, or a score of 6 or 7 on the IB exam will receive 4 advanced placement credits and may take CS 2110. These credits may be used to satisfy the requirement in computer programming for students in the College of Engineering.

Freshmen may also earn 4 credits by suitable performance on a departmental examination, given during Orientation Week. To take the departmental examination, students need only show up at the time and location indicated on the Orientation Week Schedule; advanced sign-up is not necessary.

Mathematics (Calculus)

For guidance in selecting an appropriate course, please consult *First Steps in Math*, published on the Mathematics Department web site (www.math.cornell.edu) under Courses.

The calculus courses MATH 1110, 1120, and 1910 cover substantially the same topics as 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 calculus should, if possible, take one of the CEEB's two Advanced Placement Examinations (Calculus AB or Calculus BC) during their senior year.

The Department of Mathematics offers a placement examination during orientation week that covers the material of the AP Calculus program. The department exam should be taken by

1. students who have had at least a semester of calculus but did not take a CEEB Advanced Placement Examination; or
2. students who believe that their placement is incorrect.

Students are strongly urged to take the departmental placement exam even if they feel that their grasp of the material is uncertain. The placement information is useful in any case, and the grade on the test does not become a part of the student's record. No advance registration for the departmental examination is necessary. (A separate placement exam for students in the College of Engineering or the BEE program will be announced during the academic briefings.)

Students who have been awarded advanced placement credit for calculus may not also receive academic credit for similar courses taken at Cornell.

Students who are in neither the College of Engineering nor in the Biological and Environmental Engineering (BEE) program of the College of Agriculture and Life Sciences. Students who have 4 AP credits for calculus will forfeit those credits if they take MATH 1106 or 1110. Students who have 8 AP credits for calculus will forfeit 4 credits if they take MATH 1120, 1220, or 1910 and all 8 credits if they take MATH 1106 or 1110.

Students in the College of Engineering or the Biological and Environmental Engineering (BEE) program of the College of Agriculture and Life Sciences.

Engineering students will take the engineering calculus sequence, which assumes students have one semester of calculus experience before entering Cornell. Because the engineering sequence is more advanced than other sequences at Cornell, engineering students may receive at most 4 AP credits, which they will forfeit if they take MATH 1910, the first course in the sequence.

Modern Foreign Languages

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 placement test. See "Placement Tests and Advanced Placement Credit" under "Foreign Language Requirements" in the College of Arts and Sciences section of this catalog. Students whose SAT II or AP scores are two years old or more, or who have had a year of formal study or substantial informal study since they last took a placement test should take the Cornell placement test again during orientation week if they plan to continue course work.

Advanced standing credit may be earned as follows:

1. Students with a score of 4 or 5 on the language Advanced Placement Examination of the CEEB earn 3 credits and are eligible to take the Cornell Advanced Standing Examination (CASE).
2. Students who achieve a minimum score of 65 on the Cornell language placement test given during orientation week are eligible to take the Cornell Advanced Standing Examination (CASE). Outstanding performance on this examination can result in a maximum of 3 credits.
3. For formal language work done after high school at an accredited college, credit is considered by the relevant department on submission of a syllabus and transcript. Note that credit transfer and placement are the result of different processes. Students wishing to enroll in a language course at Cornell are required to take the placement test.
4. Native speakers of languages other than English may, if an examination by the appropriate department is available, be granted a maximum of 3 credits in a foreign language.

Information about times and places of placement tests is available in the orientation booklet and from Academic and Career Counseling Services at sao.cornell.edu/orientation/placement.htm. For more information, see "College of Arts and Sciences" on language course placement, or contact Callean Hile, 303 Morrill Hall, for French, Italian, and Spanish (placement tests in French, Italian, and Spanish are available at collt.lrc.cornell.edu); Miriam Zubal, 183 Goldwin Smith Hall, for German; Doreen Silva, 226 Morrill Hall, for Russian; Kim Robinson, 388 Rockefeller Hall, for Asian languages, Nava Scharf, 409 White Hall, for Hebrew; or Munther Younes, 409 White Hall, for Arabic.

Music

Advanced placement and credit are awarded only in music theory, and only on the basis of an examination administered by the Department of Music; that is, credit cannot be earned on the basis of the AP, IB, or other examinations from outside Cornell, nor on the basis of course work done elsewhere. Outstanding performance on the departmental examination will earn students 3 credits and placement directly into MUSIC 2102. In rare instances students may place into MUSIC 3101, in which case they will earn 6 credits. The placement examination is normally administered on the Sunday during fall orientation week and, when necessary, at the beginning of the spring semester. For more information about the examination, see the departmental web site.

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 (offered only during orientation week, fall semester; appointment required). For information about the departmental examination, consult the director of undergraduate studies, 115 Clark Hall (physicsdus@cornell.edu).

Physics B—Students earning a score of 5 may receive 8 credits for non-calculus-based PHYS 1101 and 1102. Those earning a score of 5 in Physics B and a score of 4 or 5 in Calculus BC may choose to accept 4 credits in calculus-based PHYS 1112 or 2207 instead of 8 credits in PHYS 1101 and 1102. Those earning a score of 4 may receive 4 credits in PHYS 1101. Students in the College of Engineering should refer to www.engineering.cornell.edu/student-services/academic-advising/academic-information/ap-credit/index.cfm.

Physics C—Mechanics: Students earning a score of 4 or 5 may receive 4 credits for PHYS 1112 or 2207, or placement into PHYS 1116, a more analytic first-semester course, with no AP credit.

Physics C—Electricity and Magnetism: Students earning a score of 5 may receive 4 credits for PHYS 2213.

Students will not receive credit for an advanced placement course if they receive credit for a Cornell course with similar content. Students may receive credit for only one of the courses in each group:

PHYS 1101, 1112, 1116, 2207

PHYS 1102, 2208, 2213, 2217

A student planning a major in physics or applied and engineering physics and who is eligible for AP credit should consult with his or her advisor or the department representative.

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

General information and advice may be obtained from the director of undergraduate studies, 115 Clark Hall, or from the Department of Physics, 109 Clark Hall.

Statistics

Students who have been awarded advanced placement credit for statistics may not also receive academic credit for similar courses taken at Cornell. In particular, they will forfeit those credits if they take AEM 2100, HADM 2201, ILRST/STSCI 2100, MATH 1710, or PAM 2100.

Course Enrollment

PREENROLLMENT

Course enrollment for each semester at Cornell takes place partway through the preceding semester using an online application through *Student Center*. Dates are announced in advance and are posted on *Student Center*. Students are expected to meet with their faculty advisors before this period to affirm that the courses they plan to take will ensure satisfactory progress toward a degree.

New students and transfer students may be sent course enrollment instructions by their college offices before they arrive on campus. Procedures vary from college to college.

COURSE ADD/DROP/CHANGE

Students may adjust their schedules during add/drop/change periods. Courses may be added, dropped, or changed online through *Student Center*. Permission-only courses and courses with specific add/drop procedures will be handled using a written add/drop form. The form is completed by the student and signed by both the student's advisor 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. Professional schools, the School of Continuing Education and Summer Sessions, the Department of Physical Education and Athletics, and First-Year Writing Seminars have different course enrollment and add/drop policies. See the chart below for their course add/drop/change fees.

Late Course Enrollment and Late Add/Drop/Change Fees

Academic Unit	Late Course Enrollment Fee	Late Course Add/Drop/Change Fee
Continuing Education and Summer Sessions	†	
Johnson Graduate School of Management	\$100	\$100
Law School	No fee	No fee
Physical education	\$30	\$20*
Veterinary medicine	\$100*	\$100*

†Consult the Summer Session catalog and the Division of Extramural Study brochure for fees.

*Consult the college office for special considerations and requirements.

EXPLANATION OF COURSE NUMBERING SYSTEMS AND SUBJECT CODES

1100 level—introductory course, no prerequisites, open to all qualified students

2000 level—lower-division course, open to freshmen and sophomores, may have prerequisites

3000 level—upper-division course, open to juniors and seniors, prerequisites

4000 level—upper-division course, open to seniors and graduate students

5000 level—professional level (e.g., management, law, veterinary medicine)

6000 level—professional and graduate-level course, open to upper-division students

7000 level—graduate-level course

8000 level—master's level, thesis, research

9000 level—doctoral level, thesis, research

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

Engineering

Hotel Administration

Human Ecology

Industrial and Labor Relations

Nutritional Sciences

Officer Education

Group 2: Graduate professional divisions

Law

Management

Veterinary Medicine

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

Within each division, courses are generally arranged in alphabetical order by department and in numerical order within the departments. All courses 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.

Subject Codes and Their Meanings

AAP Architecture, Art, and Planning

AAS Asian American Studies

AEM Applied Economics and Management

AEP Applied and Engineering Physics

AGSCI Agricultural Sciences

AIRS Aerospace Studies

AIS American Indian Studies

ALS Agriculture and Life Sciences

AMST American Studies

ANSC Animal Science

ANTHR Anthropology

ARCH Architecture

ARKEO Archaeology

ART Art

ARTH History of Art

ASIAN Asian Studies

ASRC Africana Studies and Research Center

ASTRO Astronomy

BEE Biological and Environmental Engineering

BENGL Bengali

BIOAP Animal Physiology and Anatomy

BIOBM Biochemistry, Molecular and Cell Biology

BIOEE Ecology and Evolutionary Biology

BIOG Biology: General Courses

BIOGD Genetics and Development

BIOMB Environmental Science Marine Biology Laboratory

BIOMI Microbiology

BIOMS Biomedical Sciences

BIONB Neurobiology and Behavior

BIOPL Plant Biology

BIOSM Shoals Marine Laboratory

BME Biomedical Engineering

BSOC Biology and Society

BTRY Biometry and Statistics

BURM Burmese

CAPS China and Asia Pacific Studies

CATAL Catalan

CEE Civil and Environmental Engineering

CHEM Chemistry

CHEME Chemical and Biomolecular Engineering

CHIN Chinese

CHLIT Literature in Chinese

CIS Computing and Information Science

CLASS Classics

COGST Cognitive Science

COML Comparative Literature

COMM Communication

CRP City and Regional Planning

CS Computer Science

CSS Crop and Soil Sciences

CZECH Czech

DANCE Dance

DEA Design and Environmental Analysis

DSOC Development Sociology

DUTCH Dutch

EAS Earth and Atmospheric Sciences

ECE Electrical and Computer Engineering

ECON Economics

EDUC Education

ENGL English

ENGLF English for Academic Purposes

ENGR Communications

ENGRD Engineering Distribution Courses

ENGRG Engineering General Interest

ENGRI Introduction to Engineering Courses

ENTOM Entomology

FDSC Food Science

FGSS Feminist, Gender, and Sexuality Studies

FILM Film Studies

FRDR Freehand Drawing and Scientific Illustration

FREN French

FSAD Fiber Science and Apparel Design

GERST German Studies

GOVT Government

GRAD Graduate School

GREEK Greek

HADM Hotel Administration

HD Human Development

HE Human Ecology Interdepartmental

HINDI Hindi

HIST History

HORT Horticulture

HUNGR Hungarian

IARD	International Agriculture and Rural Development
ILRCB	Collective Bargaining, Labor Law, and Labor History
ILRHR	Human Resources Studies
ILRIC	International and Comparative Labor
ILRID	Industrial and Labor Relations Interdepartmental
ILRLE	Labor Economics
ILROB	Organizational Behavior
ILRST	Social Statistics
INDO	Indonesian
INFO	Information Science
ITAL	Italian
JAPAN	Japanese
JAVA	Javanese
JPLIT	Literature in Japanese
JWST	Jewish Studies
KHMER	Khmer (Cambodian)
KOREA	Korean
KRLIT	Korean Literature
LA	Landscape Architecture (Agriculture and Life Sciences)
LANAR	Landscape Architecture (Architecture, Art, and Planning)
LATA	Latin American Studies
LATIN	Latin
LAW	Law
LING	Linguistics
LSP	Latino Studies Program
MAE	Mechanical and Aerospace Engineering
MATH	Mathematics
MEDVL	Medieval Studies
MILS	Military Science
MSE	Materials Science and Engineering
MUSIC	Music
NAVS	Naval Science
NBA	Business Administration
NCC	Graduate School of Management Common Course
NEPAL	Nepali
NES	Near Eastern Studies
NMI	Graduate School of Management, Research and Advanced Studies
NRE	Graduate School of Management, Doctoral Seminars
NS	Nutritional Sciences
NSE	Nuclear Science and Engineering
NTRES	Natural Resources
ORIE	Operations Research and Information Engineering
PALI	Pali
PAM	Policy Analysis and Management
PE	Physical Education
PHIL	Philosophy
PHYS	Physics
PLBR	Plant Breeding
PLPA	Plant Pathology

POLSH	Polish
PORT	Portuguese
PSYCH	Psychology
QUECH	Quechua
RELST	Religious Studies
ROMS	Romance Studies
RUSSA	Russian
RUSSL	Literature in Russian
SANSK	Sanskrit
SEBCR	Serbo-Croatian
SHUM	Society for the Humanities
SINHA	Sinhala
SNES	Science of Natural and Environmental Systems
SNLIT	Literature in Sanskrit
SOC	Sociology
SPAN	Spanish
STS	Science and Technology Studies
STSCI	Statistical Science
SWED	Swedish
TAG	Tagalog
TAM	Theoretical and Applied Mechanics
THAI	Thai
THETR	Theatre Arts
TOX	Toxicology
UKRAN	Ukrainian
URDU	Urdu
VETCS	Clinical Sciences
VETMI	Microbiology and Immunology
VETMM	Molecular Medicine
VIEN	Viticulture and Enology
VIET	Vietnamese
VISST	Visual Studies
VTBMS	Biomedical Sciences
VTLIT	Literature in Vietnamese
VTMED	Veterinary Medicine Interdisciplinary
VTPMD	Population Medicine and Diagnostic Sciences

Class Attendance, Meeting Times, and Examinations

CLASS ATTENDANCE AND MEETING TIMES

Students are expected to be present throughout each semester 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.

Absences because of religious beliefs. In accordance with Section 224-a of the New York State Education Law, each student who is absent from school because of his or her religious beliefs must be given an equivalent opportunity to register for classes or make up examinations, study, or work requirements that he or she may have missed because of such absence on any particular day or days. No fees of any kind shall be charged by the university

for making available to such student such equivalent opportunity.

Class Meeting Times

Monday/Wednesday

	Start Times	End Times
50 MIN	08:00 A.M.	08:50 A.M.
75 MIN	08:40 A.M.	09:55 A.M.
50 MIN	09:05 A.M.	09:55 A.M.
50 MIN	10:10 A.M.	11:00 A.M.
50 MIN	11:15 A.M.	12:05 P.M.
50 MIN	12:20 P.M.	01:10 P.M.
50 MIN	01:25 P.M.	02:15 P.M.
50 MIN	02:30 P.M.	03:20 P.M.
75 MIN	02:55 P.M.	04:10 P.M.
50 MIN	03:35 P.M.	04:25 P.M.
50 MIN	07:30 P.M.	08:20 P.M.
75 MIN	07:30 P.M.	08:45 P.M.
50 MIN	08:35 P.M.	09:25 P.M.

Tuesday/Thursday

50 MIN	08:00 A.M.	08:50 A.M.
75 MIN	08:40 A.M.	09:55 A.M.
50 MIN	09:05 A.M.	09:55 A.M.
50 MIN	10:10 A.M.	11:00 A.M.
75 MIN	10:10 A.M.	11:25 A.M.
50 MIN	11:15 A.M.	12:05 P.M.
75 MIN	11:40 A.M.	12:55 P.M.
50 MIN	12:20 P.M.	01:10 P.M.
50 MIN	01:25 P.M.	02:15 P.M.
75 MIN	01:25 P.M.	02:40 P.M.
50 MIN	02:30 P.M.	03:20 P.M.
75 MIN	02:55 P.M.	04:10 P.M.
50 MIN	03:35 P.M.	04:25 P.M.

NO EVENING CLASSES

Friday

50 MIN	08:00 A.M.	08:50 A.M.
50 MIN	09:05 A.M.	09:55 A.M.
50 MIN	10:10 A.M.	11:00 A.M.
50 MIN	11:15 A.M.	12:05 P.M.
50 MIN	12:20 P.M.	01:10 P.M.
50 MIN	01:25 P.M.	02:15 P.M.
50 MIN	02:30 P.M.	03:20 P.M.
50 MIN	03:35 P.M.	04:25 P.M.

NO EVENING CLASSES

Laboratories and similar exercises

1 HR 55 MIN	08:00 A.M.	09:55 A.M.
	10:10 A.M.	12:05 P.M.
	12:20 P.M.	02:15 P.M.
	02:30 P.M.	04:25 P.M.
(Mon. and Wed.)	07:30 P.M.	09:25 P.M.
2 HR 25 MIN	07:30 A.M.	09:55 A.M.
	10:10 A.M.	12:35 P.M.
	02:00 P.M.	04:25 P.M.
(Mon. and Wed.)	07:30 P.M.	09:55 P.M.
3 HR	08:00 A.M.	11:00 A.M.
	10:10 A.M.	01:10 P.M.
	01:25 P.M.	04:25 P.M.
(Mon. and Wed.)	07:30 P.M.	10:30 P.M.

On Monday, Tuesday, Wednesday, and Thursday the hours of 4:25 P.M. to 7:30 P.M., on Fridays the hours after 4:25 P.M., on Saturday the hours after 12:05 P.M., and all day Sunday shall be free from all formal undergraduate classes or laboratory exercises.

Evening preliminary examinations that will be given outside of normal class hours may be scheduled on Tuesday and Thursday evenings only, beginning at 7:30 P.M. All room assignments are scheduled by the Office of the University Registrar. The dates and times of these examinations are listed in the course rosters for each semester.

Evening academic activities commencing at 7:30 P.M. on Mondays and Wednesdays, other than regularly scheduled courses and prelims previously approved by the office of the university faculty, are not permitted. Violation of these rules interferes with other university activities (e.g., athletic, musical, theatrical, or employment).

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

FINAL EXAMINATIONS

Final examinations for undergraduate courses are scheduled by the Office of the University Registrar. Examinations may be one, two, or two and one-half hours in length at the discretion of the department concerned. The schedule of final examinations is available online at www.cornell.edu/academics/courses.cfm.

General Rules Governing Final Examinations

Legislation of the university faculty governing study periods and examinations is as follows:

1. No final examinations can be given at a time other than the time appearing on the official examination schedule promulgated by the Office of the University Registrar without prior written permission of the dean of the faculty.
2. No permission will be given, for any reason, to schedule final examinations during the last week of classes or the designated study period preceding final examinations.
3. Permission will be given by the dean of the faculty to offer an alternate examination during the examination period itself if requested in writing by the faculty member, but only on condition that a comparable examination also be given for those students who wish to take it at the time the examination was originally scheduled. The faculty member requesting such a change shall be responsible for making appropriate arrangements for rooms or other facilities in which to give the examination. This should be done through the university registrar's office.
4. No tests are allowed during the last week of scheduled classes unless such tests are

part of the regular week-by-week course program and are followed by an examination (or the equivalent) during the final examination period.

5. Papers may be required of students during the study period if announced sufficiently far in advance that the student did not have to spend a significant segment of the study period completing them.
6. Faculty can require students to submit papers during the week preceding the study period.
7. Take-home examinations should be given to classes well before the end of the regular semester and should not be required to be submitted during study period but rather well into the examination period.

The university policies governing study period and final examinations are:

1. Each course should require that a final examination or some equivalent exercise (for example, a term paper, project report, final critique, oral presentation, or conference) be conducted or due during the period set aside for final examinations.
2. Although not specifically prohibited, it is university policy to discourage more than two examinations for a student in one 24-hour time period and especially on any one day. It is urged that members of the faculty consider student requests for a make-up examination, particularly if their course is the largest of the three involved and thus has the strongest likelihood of offering a make-up for other valid reasons, such as illness or death in the family.
3. Students have a right to examine their corrected exams, papers, etc., to be able to question their grading. (Note that students have no absolute right to the return thereof.) Exams, papers, etc., as well as grading records, should be retained for a reasonable time after the end of the semester, preferably till the end of the following semester, to afford students such right of review.

EVENING PRELIMINARY EXAMINATIONS

The most convenient times and places for "prelims" are the normal class times and classrooms. In cases where the only alternative is to hold evening preliminary examinations, they may be scheduled only on Tuesday and Thursday evenings and only after 7:30 P.M.

An alternative time to take the examination *must* be provided for those students who have academic, religious, athletic, or employment conflicts at the time scheduled.

Note that instructors holding evening examinations are strongly urged to indicate this in the course descriptions listed in *Courses of Study* and *must* notify students of the dates of such examinations as early as possible in the semester, preferably when the course outline is distributed. For more information on the policy governing evening examinations, contact the office of the dean of the faculty, 315 Day Hall.

Grading Guidelines

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

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

This is how a semester average is computed:

Course	Grade	Points	Quality Credits	Product
CHEM 103	B+	3.3	x 3	= 9.9
ENGL 151	C-	1.7	x 3	= 5.1
DEA 145	B	3.0	x 4	= 12.0
PAM 100	B	3.0	x 3	= 9.0
DEA 111	C	2.0	x 3	= 6.0
<i>Total</i>			16	42.0

To arrive at the semester 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 semesters) equals the sum of the products of all the grades at Cornell divided by the total number of credits taken.

S-U GRADES

On September 6, 1972, the Faculty Council of Representatives passed the following legislation:

"Resolved, that:

- a. the S-U system have symbol equivalents which are uniform within the university; S means C- or above; U means D+, D, D-, or failure.
- b. S-U options be chosen by the student during the first three weeks of the semester.
- c. the Announcements and/or supplementary course registration materials describing each course include a description of the course grading options, particularly if the course is graded with an exclusive S-U. Any change in grading options must be announced by the instructor within the first two weeks of the semester.
- d. course requirements (required reading, term paper, etc.) be the same for students electing S-U grades as for those electing letter grades."

The rules for the S-U option are further defined by each of the academic units. They are as follows:

Agriculture and Life Sciences. (1) Must have 100 credit hours with A, B, C, D grades (prorated for transfer students). (2) The S-U option is available only in those courses so designated in the course catalog after approval by the Educational Policy Committee. (3) Freshmen are limited to one optional S-U per semester.

Architecture, Art, and Planning. (1) All courses specifically required for a degree excluded. Various departments may designate specific required courses where S-U will be permitted. (2) In a course designated as S or U, the entire class is so graded. The instructor must announce this decision within the first two weeks of class. (3) Where the option for S or U exists, both student and instructor must agree on the option. This agreement must be made by the end of the third week of classes on the appropriate form in the college office. Once agreed upon, this grade option will be used for the final grade.

Arts and Sciences. (1) Courses that count toward satisfaction of major requirements should not be taken for an S or U grade unless the department grants permission. (2) Permission of instructor. (3) A minimum of 80 of the 120 hours required for the A.B. degree must be in courses for which the student has received letter grades.

Engineering. (1) The course in question must be offered with an S-U option. (2) The student must have completed at least one full semester of study at Cornell. Freshmen may not take any courses on an S-U basis during their first semester with the exception of courses graded "S-U only" such as physical education, ROTC, supplemental courses, and writing workshops. (3) The proposed S-U course must count as either a liberal studies distribution or an approved elective in the Engineering curriculum. (4) Students may elect to enroll S-U in only one course each semester in which the choice between letter grade and S-U is an option. (Additional courses offered "S-U only" may be taken in the same semester as the "elected S-U" course.) (5) After the end of the third week of classes, the grading option may not be changed nor will students be permitted to add a course in which they were previously enrolled (in the current semester) under a different grading option. Note: Courses graded S-U do not count toward eligibility on the Dean's List and may weaken a student's chances for acceptance into graduate school. Questions regarding the S-U grading option should be addressed to Engineering Advising.

Graduate School. (1) Seminars and thesis research courses are usually graded S-U, and should be registered accordingly or a grade error results at semester's end. Other courses may be registered as S-U only if offered as S-U option.

Hotel. (1) A maximum of 4 S-U credit hours per semester, not including those only offered S-U, which may only be in non-career track courses (M.M.H.) or nonconcentration, non-hotel elective courses (B.S.). (2) A maximum of 6 credits total may be taken S-U toward distribution elective requirements.

Human Ecology. (1) Not part of student's major. (2) May be used in the 9 credit hours required outside the major in Human Ecology courses. (3) Not part of hours required in humanities, natural sciences, and social sciences. (4) A department may approve S-U grading in specific courses if approved by Educational Policies Committee. (5) Total of 12 credits in S-U courses (not counting physical education) may be counted toward degree requirements during a student's college career.

Industrial and Labor Relations. (1) This option may be elected, if available in ILR electives, or in out-of-college electives but not including directed studies. (2) Degree requirements

include a minimum of 105 letter grade (A+ to D-) credits. (3) Student must also be in good academic standing. (4) A U grade is considered the equivalent of an F in determining a student's academic status. (5) Limited to two courses per semester, not to exceed four hours in any one course.

Internal Transfer. (1) S-U grades permitted only when it is the only option or (2) when specifically approved by an admissions officer in the school or college to which the student plans to transfer.

Law. Each J.D. student, after the first year, may elect to take up to two upper-class courses on an S-U basis. Students must make this election in writing to the registrar's office within two weeks of the end of the add/drop period. If made, the election shall be irrevocable. Students may not make this election in courses that they use to satisfy the Law School's upper-class writing or professional responsibility requirements. Instructors may designate specific courses that they teach as not eligible for the S-U election.

Veterinary Medicine. (1) There is one foundation course in the veterinary curriculum that is offered on an S-U basis only. All required core foundation courses must be taken for a letter grade. (2) Elective courses for veterinary students may be offered on an S-U basis at the option of the professor. S-U optionally graded courses must be chosen within the add/drop deadline.

INCOMPLETE

The grade of incomplete is appropriate only 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.

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

While it is the student's responsibility to initiate a request for a grade of incomplete, reasons for requesting one 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 grade of incomplete and the restriction, if any.

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

CHANGES IN GRADES

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

OFFICIAL TRANSCRIPTS

An official transcript is one that bears the official signature of the university registrar, sent in a sealed envelope directly from the Office of the University Registrar to another institution or agency as directed by the student. Transcripts may be requested at registrar.sas.cornell.edu. There is no fee except for overnight and/or express mail services.

University Requirements for Graduation

The *university* has only two requirements for graduation that must be fulfilled: the swim test and physical education courses. A student's *college* determines 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 registrar's office.

STUDENT RESPONSIBILITIES

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

PHYSICAL EDUCATION

Classes

All undergraduate students must complete two semesters of work in physical education unless exempted from this requirement for medical or other special reasons or by virtue of advanced standing on admission. For transfer students the requirement is reduced by the number of semesters satisfactorily completed, not necessarily including physical education, in a college of recognized standing before entering Cornell. Credit in physical education may be earned by participating in courses offered by the Department of Athletics and Physical Education, participating on an intercollegiate athletic team, or performing in the marching band.

Physical education is a requirement of the first two terms at Cornell. Students must register for it in each semester, 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 20 hours per week). Gannett Health Services can provide certifications based on health, and the financial aid office can provide certifications of employment. Students should see the director or assistant director of Physical Education to establish postponements or waiver of the requirement. Questionable or unusual cases may be resolved by petition to the Faculty Advisory Committee on Athletics and Physical Education.

Swim Test

The Faculty Advisory Committee on Athletics and Physical Education has established a basic swimming and water safety competency requirement for all entering freshman undergraduate students. Normally, the test is given for women in the Helen Newman pool and for men in the Teagle pool as part of their orientation process. The test consists of a feet-first entry into the deep end of the pool and a continuous 75-yard swim using front, back, and optional strokes. Any student who cannot pass the swim test is required to include the course Beginning Swimming and Water Safety in his or her program of physical education before electives can be chosen. A swim test hold will be placed on the student's record until he or she has passed the swim test or fulfilled the requirement by satisfactory attendance in two semesters of Beginning Swimming and Water Safety. Students unable to meet the swim requirement because of medical, psychological, or religious reasons must petition the Faculty Advisory Committee on Athletics and Physical Education for a waiver of the requirement. When a waiver is granted by the Faculty Committee on Physical Education, an alternate requirement is imposed. The alternate requirement substitutes a course in either Certified First Responder, Emergency Medical Technician, or Wellness and Fitness for the original swimming requirement.

Internal Transfer Division

Students may not always be satisfied with the original Cornell school or college into which they've been admitted, and may decide to transfer from one college to another within the university. This process is called internal transfer, and application procedures and deadlines vary by college. It may be possible to be admitted directly into a new program. Students who are uncertain if they immediately qualify for direct transfer, however, should contact the Internal Transfer Division (ITD). Generally students whose current curriculum differs substantially from that of their target college, or students with below-average records, are not eligible for direct transfer but can apply for sponsorship to the ITD.

To apply for sponsorship, candidates must interview with the division's director and submit a copy of their target college's application for internal transfer to the ITD. In many cases, colleges formally sponsor students in ITD and essentially guarantee admission if students successfully complete the requirements (taking particular courses, earning a specified grade point average while enrolled in ITD) that are outlined in their letter of sponsorship. Students are encouraged to apply simultaneously for direct transfer and for sponsorship to ITD, so that if direct transfer is denied, their target college may offer the opportunity of being sponsored in the Internal Transfer Division. Tuition and fees for students sponsored in ITD are the same as those of the sponsoring college.

For more information about internal transfer requirements, students should contact the admissions office of their target college and the office of the Internal Transfer Division, 220 Day Hall (255-4386).

Service-Learning Course Guide

Service-learning courses at Cornell are offered from various colleges and disciplines to engage students, faculty, and community partners on issues relating to poverty, literacy, education, access, health care, immigration, hunger, affordable housing, environment, and others. Service-learning courses are academically rigorous and offer students opportunities to link theory and practice through structured public service activities in collaboration with local communities, and thus gain further understanding and appreciation of the discipline, while achieving an enhanced sense of civic responsibility.

Through Service-learning, students gain hands-on problem-solving skills, develop an aptitude for critical thinking, and become active citizens in our democratic society. The Cornell Public Service Center (PSC) serves as the hub of public service and civic engagement activities on campus.

For students and faculty members who are interested or engaged in public service, public scholarship, and civic engagement, the Public Service Center has developed a comprehensive list of Service-learning courses on campus. For more information, please visit www.psc.cornell.edu.

Interdisciplinary Centers, Programs, and Studies

ANDREW D. WHITE PROFESSORS-AT-LARGE

726 University Avenue (255-0832)
adwhiteprofessors.cornell.edu

The program has its origins in Cornell's early history. Andrew D. White, the first president of Cornell University, inaugurated the position of nonresident professor, to be held by eminent scholars, scientists, and intellectuals who periodically visit the university for the stated purpose of "contributing to the intellectual and cultural life of the university." Toward this end, Andrew D. White Professors-at-Large engage in a variety of activities including public lectures, ongoing courses, and collaborative research, as well as holding office hours for undergraduate and graduate students. They serve for a six-year term and are full members of the faculty when in residence.

Term Ending in 2010

Aldous, David, statistician
 Leeson, Lynn Hershman, digital artist
 Peskin, Charles, mathematician
 Sala, Osvaldo, ecologist
 Tibi, Bassam, Islamist

Term Ending in 2011

Sims, Lowery Stokes, art curator

Term Ending in 2012

Angier, Natalie, science writer

Term Ending in 2013

Lakhdar Brahimi, diplomat
 Sir Partha Dasgupta, economist
 Shri Kulkarni, astronomer

Ann Markusen, regional planner
 Laura Restrepo, writer, journalist, and activist

Term Ending 2014

Hélène Cixious, writer and literary theorist
 Hans Föllmer, mathematician
 Denise Riley, philosopher and poet

FRANK H. T. RHODES CLASS OF '56 UNIVERSITY PROFESSORSHIP

To commemorate their 40th reunion, the Class of 1956 initiated an endowment to create the Frank H. T. Rhodes Class of '56 University Professorship in honor of Cornell's ninth president (1977-1995). The purpose of the Rhodes Class of '56 Professorship is to strengthen the undergraduate experience by bringing to the university individuals from every walk of life who represent excellence of achievement and to create opportunities for interaction with undergraduates. The endowment also makes it possible to create public events related to the professorship such as lectures, performances, films, art exhibits, or conferences. Rhodes Class of '56 Professors are full members of the faculty while in residence. Appointments are awarded for a period of one to five years. During each year of their appointment, Rhodes Class of '56 Professors visit the campus for a week to engage in a variety of activities including public lectures, ongoing courses, and collaborative research.

Current Appointments

Eisenman, Peter, architect
 Grandin, Temple, associate professor of animal science
 Moses, Robert Parris, civil rights leader and founder of the Algebra Project
 Zinni, Anthony, USMC four-star general (retired)

CENTER FOR APPLIED MATHEMATICS

657 Frank H. T. Rhodes Hall (255-4335)

The Center for Applied Mathematics administers a broad-based interdepartmental graduate program that provides opportunities for study and research over a wide range of the mathematical sciences. Each student develops 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, 657 Frank H. T. Rhodes 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.

Graduate students in the center take courses related to their program of study that are offered by various departments. Below are listed selected courses in applied mathematics in the main areas of research interest of the center's members. Detailed descriptions of these courses can be found in the listings of the individual departments.

Selected Applied Mathematics Courses

Basic Graduate Courses in Mathematics and Applied Mathematics

MATH 4130 Honors Introduction to Analysis I
 MATH 4140 Honors Introduction to Analysis II
 MATH 4330 Honors Linear Algebra
 MATH 4340 Honors Introduction to Algebra
 MATH 6110 Real Analysis
 MATH 6120 Complex Analysis
 MATH 6150 Mathematical Methods in Physics
 MATH 6210 Measure Theory and Lebesgue Integration
 MATH 6220 Applied Functional Analysis
 MATH 6310-6320 Algebra
 MATH 6330 Noncommutative Algebra
 MATH 6340 Commutative Algebra
 MATH 6510 Algebraic Topology
 MATH 6610 Geometric Topology
 TAM 6100, 6110 Methods of Applied Mathematics I, II, III
 TAM 6130 Asymptotics and Perturbation Methods

Analysis (and Differential Equations)

MATH 4280 Introduction to Partial Differential Equations
 MATH 6170 Dynamical Systems
 MATH 6180 Smooth Ergodic Theory
 MATH 6190-6200 Partial Differential Equations
 MATH 6520-6530 Differentiable Manifolds I and II
 MATH 6620 Riemannian Geometry
 MATH 7110-7120 Seminar in Analysis
 MATH 7130 Functional Analysis
 MATH 7150 Fourier Analysis
 MATH 7170 Applied Dynamical Systems

Logic and Theory of Computing

CS 5220 Applications of Parallel Computers
 CS 6766 Reasoning about Uncertainty
 CS 6810 Theory of Computing
 CS 7192 Seminar in Programming Refinement Logics
 MATH 4860 Applied Logic (also CS 4860)
 MATH 6810 Logic
 MATH 7810-7820 Seminar in Logic
 MATH 7830 Model Theory
 MATH 7840 Recursion Theory
 MATH 7870 Set Theory
 MATH 7880 Topics in Applied Logic

Numerical Mathematics and Operations Research

CS 4220 Numerical Analysis: Linear and Nonlinear Problems (also MATH 4260)
 CS 6210 Matrix Computations
 CS 6220 Sparse Matrix Computations
 CS 6240 Numerical Solution of Differential Equations
 CS 6670 Machine Vision
 CS 6820 Analysis of Algorithms
 MATH 4250 Numerical Analysis and Differential Equations (also CS 4210)
 ORIE 6335 Scheduling Theory
 ORIE 6300-6310 Mathematical Programming, I and II
 ORIE 6320 Nonlinear Programming
 ORIE 6325 Interior-Point Methods for Mathematical Programming

Discrete Mathematics and Geometry

MATH 4410 Introduction to Combinatorics I
 MATH 4420 Introduction to Combinatorics II
 MATH 4550 Applicable Geometry
 ORIE 6328 Convex Analysis
 ORIE 6330 Graph Theory and Network Flows
 ORIE 6336 Integer Programming

Information Communication and Control Theory

CHEME 4720 Feedback Control Systems (also ECE 4720, MAE 4780)
 ECE 4110 Random Signals in Communications and Signal Processing
 ECE 4250 Digital Signal Processing
 ECE 4670 Digital Communication Receiver Design
 ECE 5210 Theory of Linear Systems (also MAE 5210)
 ECE 5620 Fundamental Information Theory
 ECE 5640 Detection and Estimation
 ECE 5670 Digital Communications
 ECE 5800 Control and Optimization of Information Networks

Mathematical Biology

BIOEE 4600 Theoretical Ecology
 BTRY 6970 Individual Graduate Study in Biometry and Statistics

Mathematical Economics

ECON 6190 Econometrics I
 ECON 6200 Econometrics II
 ECON 7100 Stochastic Economics: Concepts and Techniques
 ECON 7170 Mathematical Economics
 ECON 7180 Topics in Mathematical Economics
 ECON 7190-7200 Advanced Topics in Econometrics

Mechanics and Dynamics

CHEME 7310 Advanced Fluid Mechanics and Heat Transfer
 CHEME 7510 Mathematical Methods of Chemical Engineering Analysis
 CHEME 7530 Analysis of Nonlinear Systems: Stability, Bifurcation, and Continuation
 MAE 6010 Foundations of Fluid Dynamics and Aerodynamics
 MAE 7340 Analysis of Turbulent Flows
 MAE 7370 Computational Fluid Mechanics and Heat Transfer
 TAM 5700 Intermediate Dynamics
 TAM 5780 Nonlinear Dynamics and Chaos
 TAM 6710 Hamiltonian Dynamics
 TAM 6720 Celestial Mechanics (also ASTRO 6579)
 TAM 6730 Mechanics of the Solar System (also ASTRO 6571)
 TAM 6750 Nonlinear Vibrations
 TAM 7510 Continuum Mechanics and Thermodynamics
 TAM 7520 Nonlinear Elasticity
 TAM 7760 Applied Dynamical Systems (also MATH 7170)

Probability and Statistics

ECE 4110 Random Signals in Communications and Signal Processing
 ECE 5620 Fundamental Information Theory
 ECE 5660 Fundamentals of Networks
 MATH 6710-6720 Probability Theory
 MATH 6740 Introduction to Mathematical Statistics
 MATH 7770-7780 Stochastic Processes
 ORIE 5560 Queuing Systems: Theory and Applications
 ORIE 5550 Applied Time-Series Analysis
 ORIE 6510 Probability
 ORIE 6540 Applied Stochastic Processes
 ORIE 6620 Advanced Stochastic Processes

ORIE 6700 Statistical Principles
 ORIE 6710 Intermediate Applied Statistics
 BTRY 4080 Theory and Probability
 BTRY 4090 Theory of Statistics

Robotics and Vision

CS 6670 Machine Vision
 ECE 5470 Computer Vision

Theoretical/Mathematical Physics/Chemistry

CHEM 7920 Molecular Collision Theory
 CHEM 7930 Quantum Mechanics I
 CHEM 7940 Quantum Mechanics II
 CHEM 7960 Statistical Mechanics
 CHEM 7980 Bonding in Molecules
 PHYS 6553-6554 General Relativity (also ASTRO 6509-6510)
 PHYS 6561 Classical Electrodynamics
 PHYS 6562 Statistical Mechanics
 PHYS 6572 Quantum Mechanics I
 PHYS 6574 Applications of Quantum Mechanics II
 PHYS 7651-7652 Relativistic Quantum Field Theory

MARIO EINAUDI CENTER FOR INTERNATIONAL STUDIES

170 Uris Hall (255-6370)

The Mario Einaudi Center for International Studies was established in 1961 to encourage and support comparative and interdisciplinary research on international subjects. Currently, it supports four U.S. Department of Education Title VI National Resource Centers and 15 other international programs. While some programs offer study of geographic regions, others focus on such topics as international agriculture, nutrition, population, law, planning, politics, rural development economics, and world peace. More than 800 faculty members voluntarily collaborate with the center and its associated programs. Undergraduate students may choose from a variety of minors such as international relations, Latin American studies, modern European studies, French studies, East Asian studies, South Asian studies, Southeast Asian studies, global health, or international agriculture and rural development.

In its ongoing effort to anticipate and respond to changing global circumstances and perspectives, the center applies its resources to new pilot activities and initiatives that bring faculty members and students together across traditional disciplines and departmental boundaries. As part of its Foreign Policy Initiative, the center has formed a network of 38 faculty members, brought experts to campus to speak on topical themes as part of a Distinguished Speaker Series, and provided seed funding for activities in foreign policy studies. The center also organizes semi-annual seed grant competitions for faculty and programs to advance international studies at Cornell and support faculty to mobilize additional external support.

Each year the center brings an eminent world leader to campus as the Henry E. and Nancy Horton Bartels World Affairs Fellow to deliver a public lecture, meet with classes, and interact informally with faculty members and students. The center also hosts a Current Events Roundtable each June that enables Cornell alumni to join faculty members in discussions of key world events.

Graduate students' overseas field research is supported through the center's annual travel grant competition as well as the Fulbright fellowship program and the Fulbright-Hays awards, which are both administered by the center.

Web sites of many international programs are hosted by the center along with the university's International Gateway (www.international.cornell.edu), a web site created by the center to showcase Cornell's international dimensions.

An undergraduate course, *Issues behind the News: An Interdisciplinary Analysis of International Current Events*, is coordinated by the center and offered by the Department of Government of the College of Arts and Sciences. The center invites faculty from across the university to deepen students' understanding of issues on the front pages of newspapers as events unfold during the semester.

For additional information on current programs, publications, and courses, contact:

Mario Einaudi Center for International Studies

Gilbert Levine, center interim director
David R. Lee, director of the international relations minor
170 Uris Hall
www.einaudi.cornell.edu

Berger International Legal Studies

John Barceló, program director
www.lawschool.cornell.edu/international

Comparative Economic Development Program

Kaushik Basu, program director
www.einaudi.cornell.edu/ced

Comparative Muslim Societies Committee

Eric Tagliacozzo, program director
www.einaudi.cornell.edu/cmcs

Comparative Societal Analysis Program

Valerie Bunce, program director
www.soc.cornell.edu/research/comparative.shtml

Cornell Food and Nutrition Policy Program

David Sahn, program director
www.nutrition.cornell.edu/grad/cfnpp.html

Cornell International Institute for Food, Agriculture, and Development

Alice Pell, program director
www.ciifad.cornell.edu

East Asia Program

Ding Xiang Warner, program director
www.einaudi.cornell.edu/eastasia

International Business Education Program

www.johnson.cornell.edu/research/international

Global Health Program

Rebecca Stoltzfus and Warren Johnson, program codirectors
www.human.cornell.edu/che/DNS/globalhealth

Institute for African Development

Muna Ndulo, program director
www.einaudi.cornell.edu/africa

Institute for European Studies

Christopher Anderson, program director
www.einaudi.cornell.edu/europe

International Political Economy Program

Tom Pepinsky, program director
www.einaudi.cornell.edu/ipep

International Programs in the College of Agriculture and Life Sciences

Ronnie Coffman, program director
www.ip.cals.cornell.edu

International Studies in Planning Program

William Goldsmith, program director
www.dcrp.cornell.edu/programs/isp.mgi

Latin American Studies Program

Deborah Castillo, program director
www.einaudi.cornell.edu/latinamerica

Peace Studies Program

Jonathan Kirshner, program director
www.einaudi.cornell.edu/peaceprogram

Population and Development Program

Thomas Hirschl, program director
www.einaudi.cornell.edu/pdp

South Asia Program

Dan Gold, program director
www.einaudi.cornell.edu/southasia

Southeast Asia Program

Thak Chaloeintiarana, program director
www.einaudi.cornell.edu/southeastasia

CENTER FOR THE STUDY OF INEQUALITY

363 Uris Hall
254-8674 (tel.)
inequality@cornell.edu
www.inequality.cornell.edu

The Center for the Study of Inequality (CSI) fosters basic and applied research on social and economic inequalities as well as the processes by which such inequalities change and persist. The study of inequality lies at the heart of current debates about segregation, affirmative action, the "glass ceiling," globalization, and any number of other contemporary policy issues. In recent years, public and scholarly interest in issues of inequality has intensified, not merely because of historic increases in income inequality in the United States and other advanced industrial countries, but also because inequalities of race, ethnicity, and gender are evolving in equally dramatic and complicated ways. The mission of CSI is to support research and teaching relevant to issues of inequality, to disseminate findings resulting from this research, and to otherwise facilitate the study of inequality in the United States and throughout the world.

Minor in Inequality Studies

The minor in inequality studies allows undergraduate students to supplement their studies for their major with a coherent program of courses oriented toward the study of inequality. The minor is organized into tracks examining such topics as globalization and inequality; social policy; the ethics of inequality; poverty and economic development; social movements; education and inequality; race and ethnicity in comparative perspective; and the family and inequality. The minor is open to students enrolled in any of the seven Cornell undergraduate colleges. When the

requirements of the minor are met, an official note is made on the student's academic record (see www.inequality.cornell.edu/academics for further information).

Symposia and Lecture Series

CSI regularly sponsors symposia, workshops, and lecture series that draw attention to the most pressing problems and controversies in the field. The current schedule of events is listed on the center's web site (www.inequality.cornell.edu).

For more information about CSI, contact us at 254-8674 or inequality@cornell.edu.

COGNITIVE SCIENCE

278G Uris Hall
255-6431
cogst@cornell.edu
www.cogsci.cornell.edu

Cognitive Science focuses on the nature and representation of knowledge. It approaches the study of perception, action, language, and thinking from several perspectives—theory, experiment, and computation—with the aim of gaining a better understanding of human cognition and the nature of intelligent systems. The comparison between human and artificial intelligence is an important theme, as is the nature of mental representations and their acquisition and use. Cognitive Science draws primarily from the disciplines of computer science, linguistics, neuroscience, philosophy, and psychology. The field of Cognitive Science is primarily represented by faculty members in the following departments: Communication, Computer Science, Design and Environmental Analysis, Economics, Education, Electrical and Computer Engineering, Human Development, Information Science, Linguistics, Mathematics, Mechanical and Aerospace Engineering, Neurobiology and Behavior, Philosophy, Psychology, and Sociology, as well as the Johnson Graduate School of Management.

Undergraduate Programs

An undergraduate minor in Cognitive Science in the College of Arts and Sciences provides a framework for the design of structured, individualized programs of study in this growing interdisciplinary field. Such programs of study are intended to serve as complements to intensive course work in a single discipline as represented in an individual department. For further information on the undergraduate program, see the Cognitive Science Program under College of Arts and Sciences and/or contact Julie Simmons-Lynch, program coordinator (255-6431 or cogst@cornell.edu).

Graduate Programs

Cornell offers a graduate field minor in Cognitive Science. Cornell's unique program of graduate training, which seeks to tailor an optimal program of study and research for each individual, fosters interdisciplinary committees. It is the norm for students interested in Cognitive Science to combine faculty members from such fields as philosophy, computer science, linguistics, psychology, or neurobiology and behavior on common committees. For further information on the graduate field of Cognitive Science, contact Morten Christiansen, director of graduate studies (255-3570, mhc27@cornell.edu).

edu) and/or contact Julie Simmons-Lynch, program coordinator, 278G Uris Hall, Office of Cognitive Science (255-6431 or cogst@cornell.edu).

Courses

Courses from across the university that are relevant to the Cognitive Science Program are listed in this catalog in the Cognitive Science Program section under Arts and Sciences.

CORNELL ABROAD

300 Caldwell Hall
255-6224 (tel.)
255-8700 (fax)
cuabroad@cornell.edu
www.cuabroad.cornell.edu

Study abroad is an integral part of a Cornell education. Those aspiring to lead in this century need, more than ever before, knowledge and experience of the diverse world beyond the boundaries of their home country. To help students develop the knowledge, skills, and attitudes necessary for informed citizenship in today's world, Cornell Abroad offers a wide range of international study opportunities that reflect the fundamental educational goals and objectives of the university. Study abroad is a continuous experience with study on campus, enabling students to make regular progress toward the degree.

Qualified students study abroad through programs administered by Cornell and other institutions, and by enrolling directly in foreign universities. Among the many study abroad programs available, students select programs with thoughtful planning and apply with the approval of their colleges and faculty advisors. To earn credit for overseas study during the fall and/or spring semester(s), students must apply through Cornell Abroad, whose staff members assist in the planning and application process.

LOCATIONS ABROAD

Cornell students majoring in a broad array of fields in all seven undergraduate colleges study in more than 40 countries each year. The following list includes programs chosen frequently by students with college approval; programs preceded by an asterisk (*) are managed by or affiliated with Cornell.

AFRICA

Botswana, Cameroon, Ghana, Kenya, Madagascar, Mali, South Africa, Tanzania, Uganda: SIT Study Abroad

Ghana: University of Ghana (through CIEE); NYU

Kenya: Wildlife Management (School for Field Studies); University of Nairobi; Minnesota Studies in International Development

South Africa: Universities of Cape Town and KwaZulu-Natal, Organization for Tropical Studies, International Human Rights Exchange (Bard)

ASIA

China: Chinese University of Hong Kong; *Cornell FALCON at Peking University; Inter-University Program for Chinese Language Studies at Tsinghua University, Beijing; Peking, Nanjing, and East China Normal Universities (CIEE); International Chinese Language Program at National Taiwan University; IES, CET, and the Alliance for Global Education in Beijing or Shanghai; Hong Kong University of Science and Technology; Syracuse or Columbia University program at Tsinghua University; *CAPS at Peking University

India: School for International Training; St. Stephen's College Delhi (through Brown or Rutgers University); CIEE at University of Hyderabad; IES Delhi; Alliance for Global Education in Pune

Indonesia: SIT Study Abroad, Bali

Japan: *Kyoto Consortium for Japanese Studies; International Christian University and other university programs; IES Tokyo; CIEE Tokyo at Sophia University; Kyushu University

Korea: Yonsei University; Ewha University

Nepal: *Cornell-Nepal Study Program (Samyukta Adhyayan Karikam Nepal) at Tribhuvan University

Thailand: Khon Kaen University (CIEE)

Vietnam: University of Hanoi (CIEE), CET

AUSTRALIA AND NEW ZEALAND

Australia: Australian National University, Canberra; University of Sydney; University of Melbourne; University of New South Wales, Sydney; University of Queensland, Brisbane; University of Western Australia, Perth; School for Field Studies Tropical Rainforest Studies; Sydney Internship (Arcadia, Boston University)

New Zealand: Otago, Auckland, Massey, Canterbury, and Lincoln Universities; EcoQuest

EUROPE

Czech Republic: UPCES (CERGE-EI) at Charles University, CET program in Jewish Studies, CIEE Prague

Denmark: *Danish Institute for Study Abroad (DIS)

France: *EDUCO (Cornell, Duke, and Emory in Paris) at Université de Paris VII, Paris IV, Paris I, Institut d'Études Politiques de Paris ("Sciences Po"); Critical Studies Program at the University of Paris (CIEE); Paris Internship (Boston University); IES Business and International Affairs, Paris

Germany: *Berlin Consortium for German Studies at the Free University of Berlin; Wayne State University in Munich and Freiburg; Heidelberg University

Greece: College Year in Athens; Arcadia

Hungary: Central European University; CIEE Budapest; Budapest Semester in Math

Ireland: Trinity College Dublin and the National University Colleges of Dublin, Galway, and Cork

Italy: *Bologna Consortial Studies Program; *Cornell College of Architecture, Art, and Planning in Rome; Arcadia University in Florence at the Accademia Italiana; Boston University in Padova; IES Milan and Rome; Intercollegiate Center for Classical Studies in Rome or Sicily; Syracuse University in Florence

Netherlands: University of Amsterdam; Leiden University

Russia: St. Petersburg University (CIEE); Moscow International University and other universities (American Council of Teachers of Russian); Smolny College, Math in Moscow

Spain: *Cornell-Michigan-Penn program at the University of Seville; *Consortium for Advanced Studies in Barcelona; various language and culture programs

Sweden: The Swedish Program at the University of Stockholm

United Kingdom: *Direct enrollment at: the University of Birmingham; University of Bristol; Cambridge University; City University; University of East Anglia; University of Edinburgh; University of Glasgow; University of Manchester; University of Oxford; University of St. Andrews; University of Sussex; University of Warwick; University of York; University of London: King's College, University College (including the School of Slavonic and East European Studies), Imperial College of Science and Technology, the London School of Economics and Political Science, and the School of Oriental and African Studies, the University of the Arts (including London College of Fashion), as well as other universities and art schools of choice.

Externally sponsored programs in the UK include the British American Drama Academy; the Arcadia, Boston, and Rochester University internships; and the Hansard Parliamentary Internship Programme.

Students studying in the United Kingdom enjoy a variety of services, and cultural activities, provided by the Cornell-Brown-Penn Centre in London.

LATIN AMERICA, CENTRAL AMERICA, AND THE CARIBBEAN

Argentina, Chile, or Peru: various university-based study abroad programs, through the Institute for Study Abroad of Butler University or CIEE

Brazil, Chile, Ecuador, Mexico, Nicaragua, Panama, Peru: School for International Training (SIT)

Costa Rica: Organization for Tropical Studies (OTS) Semester Abroad in tropical biology; School for Field Studies; CIEE

Ecuador: Minnesota Studies in International Development

Ecuador, Jamaica, or Mexico: International Partnership for Service Learning (IPSL)

Honduras: Escuela Agrícola Panamericana (Zamorano)

Mexico: Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM); Universidad de las Americas-Puebla (UDLA); Universidad Iberoamericana; School for Field Studies in Baja California; ISFA-Butler program at Universidad Autónoma de Yucatán, Merida

MIDDLE EAST AND NORTH AFRICA

Egypt: American University in Cairo

Israel: Ben-Gurion University; University of Haifa; Hebrew University of Jerusalem; Tel Aviv University

Jordan: University of Jordan (CIEE), SIT

Lebanon: American University of Beirut

Morocco: SIT Study Abroad, CIEE, Boston University, IES

Oman: SIT Study Abroad

Other Locations

Cornell students are by no means limited to the locations listed above or to the programs identified for particular countries. In recent years, they have also studied in Austria, Croatia, Dominican Republic, Finland, Mongolia, Poland, Portugal, Switzerland, Tajikistan, Turkey, Venezuela, and elsewhere.

Who Studies Abroad

Students from all seven undergraduate colleges and from all major fields study abroad; they are expected to have a cumulative grade point average of 3.0 or above. Over 500 undergraduates studied abroad last year. Because the colleges usually require that students complete at least 60 hours of undergraduate credit on the Ithaca campus, students who transfer to Cornell as juniors may be unable to count study abroad credit toward their Cornell degree.

When Students Study Abroad and for How Long

Students may study abroad during their sophomore, junior, or senior year. Junior year is the traditional choice, but second-semester sophomore year or first-semester senior year abroad is increasingly popular. To ensure preparation, it is important to begin planning for study abroad as early as freshman year. Although semester-long programs are usually available, academic-year programs are highly recommended.

Application Process

Applications for all study abroad programs—Cornell programs, as well as those administered by other institutions—are available at Cornell Abroad, 300 Caldwell Hall, where students are encouraged to consult the library of study abroad materials, talk with staff members, and attend information meetings. The Cornell Abroad web site is an excellent resource for links to universities and programs worldwide, as well as for applications and comprehensive information on all aspects of study abroad. Students meet with the study abroad advisors in their colleges to discuss how they will meet college degree requirements.

Each applicant completes a written statement of academic purpose outlining goals for study abroad and the program of study that will be followed. College Approval Forms are signed by both the faculty advisor and the college study abroad advisor. Arts and Sciences,

Human Ecology, and Industrial and Labor Relations students submit applications to their college for forwarding to Cornell Abroad; Agriculture and Life Sciences, Architecture, Art, and Planning, Engineering, and Hotel Administration students submit applications directly to Cornell Abroad. Cornell Abroad reviews all applications and forwards them to programs and universities. *All students who wish to receive academic credit for study abroad must apply through Cornell Abroad and their undergraduate college.*

The application *deadline* for study abroad in the fall 2010 semester and the 2010–2011 academic year is February 15, 2010, for all programs *except* Oxford and Cambridge, for which the deadline to study at those universities for the academic year in 2010–2011 is November 1, 2009. Many universities and programs admit on a rolling basis before and after these dates. Students planning to study abroad in the spring semester should initiate the application process during the preceding spring. Early application may improve your chances of admission. In all cases, it is a good idea to check with Cornell Abroad.

Registration, Credit Transfer, and Grades

Students who apply through Cornell Abroad to programs approved by their colleges, as outlined above, remain registered at Cornell during study abroad. They are eligible for financial aid and receive full academic credit for pre-approved courses of study completed with satisfactory grades. Students enroll for a normal full load of courses abroad, according to the standards of the institution or program overseas, and usually receive 30 credits per year, or 12 to 20 credits per semester. The colleges review course work taken abroad and make the final decisions concerning credit transfer and distribution. When study abroad credit has been transferred, the Cornell transcript will indicate the names of the courses taken, the grades received, and the total credits earned for each semester. *Foreign grades are not translated into the Cornell/American grading system, nor are they averaged into the Cornell grade point average.*

Foreign Language Requirements

Study abroad programs in non-English-speaking countries that offer direct enrollment in universities generally require the equivalent of at least two years of college-level language study. Students should make firm plans for any requisite language courses early in their freshman year. English-language study abroad programs are increasingly available in non-English-speaking countries—for example, Belgium, Denmark, Egypt, France, Hong Kong, Hungary, Israel, Italy, Japan, Korea, Netherlands, People's Republic of China, and Sweden. Cornell requires students who participate in programs in a non-English-speaking country with English-language course work to take at least one language course as part of their program of study and strongly encourages them to take more. Students should consult with their college study abroad advisors about relevant language preparation, and students in the College of Arts and Sciences should note that they are required to have studied the host country language, if taught at Cornell, before study abroad.

Housing Arrangements

Study abroad programs generally provide housing in the homes of local residents, in halls of residence for university students, or in rental apartments. Cornell Abroad will advise students of the arrangements that are available and most appropriate to their individual needs.

Costs

Students studying abroad in Cornell-managed programs pay a fixed Cornell Abroad Tuition per semester, which covers tuition, housing during term (with some exceptions), orientation, program-sponsored trips and events, and administrative and financial aid costs, including emergency medical evacuation and repatriation coverage. It may include other items (e.g., meals, commuter passes) depending on the program. Students pay other costs (e.g., airfare and personal expenses) directly. Different fee levels for Cornell programs reflect the relative costs of operation.

Pending approval by the Board of Trustees, in 2009–2010 the Cornell Abroad Tuition for students participating in the Berlin Consortium for German Studies, the Cornell Nepal Study Program, EDUCO (Emory, Duke, and Cornell in Paris), or the Michigan–Cornell–Penn Program in Seville is \$21,950.

For the Denmark Institute for Study Abroad (DIS), the Cornell Abroad Tuition is \$23,490 per semester, and for the Kyoto Consortium for Japanese Studies (KCJS), the Tuition is \$28,325 per semester. For the Bologna Consortial Studies Program (BCSP), the Tuition is \$16,345 per semester for academic-year students and \$18,995 for spring-only participants. For the Consortium for Advanced Studies in Barcelona (CASB) the fee is \$22,250 for fall and \$23,600 for spring.

Students studying in all other programs in 2009–2010 pay the tuition and other costs charged by their programs and a Cornell International Program Tuition (CIPT) of \$4,995 per semester. The CIPT covers the direct and indirect costs of study abroad to the university, including financial aid for all study abroad students. Students studying in the United Kingdom and Israel on direct enrollment programs at British and Israeli universities pay a Cornell International Program Tuition of \$5,410. This higher amount covers the cost of on-site support services provided by Cornell Abroad.

Financial Aid

Students who are accepted for study abroad during the academic year or semester, having applied through Cornell Abroad, are eligible for two semesters of financial aid, consistent with general university aid policy; this applies to all programs, whether run directly by Cornell or not. Students who have transferred into Cornell with 60 or more credit hours are not likely to receive aid for study abroad assuming they would thereby need more than eight semesters to earn the undergraduate degree. Some programs abroad offer need-based and merit-based scholarships; there are also external sources of aid for which Cornell Abroad students are eligible.

Security Abroad and Related Issues

The decision to study in a particular region of the world must be made by each student and his or her family in light of their own interpretation of current events. The director, associate director, and staff of Cornell Abroad stay in regular contact with representatives abroad and receive information regarding safety and security conditions worldwide through the U.S. Department of State Office of Citizens Emergency Services and other agencies. As long as the State Department does not restrict travel by U.S. citizens, Cornell Abroad does not normally recommend limitations on student plans for study abroad. Cornell Abroad will do everything possible to notify students immediately that they should defer plans when official travel restrictions are issued. Nothing is as important as student security and well-being.

Responsibility for a decision to withdraw from a program or return home early rests with the individual and his or her family. There can be no guarantee of credit for students who withdraw from programs sponsored by colleges and universities other than Cornell; they are advised to inquire about the policies of those institutions regarding the completion of academic work and the potential financial implications of premature departure. In the event of a disrupted semester, refunds of tuition and fees, and the number of credits to be awarded, will be reviewed by Cornell and affiliated institutions on a case-by-case basis. Most institutions sponsoring study abroad programs strive to facilitate student completion of academic programs even under unusual circumstances and have tuition refund policies based on prorated formulas.

Sources of Information and Advice Concerning Study Abroad

Cornell Abroad (300 Caldwell Hall): Richard Gaulton, Ph.D., director; Kristen Grace, Ph.D., associate director; Libby Okihiro, student services coordinator; Kathy Lynch, financial services coordinator. The Cornell Abroad library contains an extensive collection of university catalogs and study abroad program brochures, files of course syllabi and evaluations, books, videotapes and CDs, and some information on travel, summer study, and work abroad. Comprehensive information is provided on the Cornell Abroad web site (www.cuabroad.cornell.edu), which incorporates links to universities, programs, and resources worldwide as well as a database of cost estimates. In the early weeks of every semester, students and faculty and staff members discuss programs in a series of information meetings announced in the *Cornell Daily Sun* and on the Cornell Abroad web site (www.cuabroad.cornell.edu). The director and associate director are available at Cornell Abroad for individual advising.

College Study Abroad Advisors

Agriculture and Life Sciences: Christine Potter, 140 Roberts Hall; *Architecture, Art, and Planning:* Melanie Holland, B-1 West Sibley Hall; *Arts and Sciences:* Dean Pat Wasyliv, 55 Goldwin Smith Hall; *Engineering:* Engineering Advising, 167 Olin Hall; *Hotel Administration:* Barbara Lang, 180 Statler Hall; *Human Ecology:* Paul Fisher, 172 Martha Van Rensselaer Hall; *Industrial and Labor Relations:* Kevin Harris, 101 Ives Hall.

CORNELL IN WASHINGTON PROGRAM

M101 McGraw Hall
255-4090
ciw.cornell.edu

Cornell in Washington is a unique opportunity for students in any major or with any career interest. Qualified juniors and seniors in all colleges can earn full academic credit—and grades that count in their GPAs—for a semester in Washington, D.C., taking small, seminar courses from Cornell faculty members, conducting research, getting real-life work experience, and living at the Cornell Center near Dupont Circle.

Washington, as the center of much of the nation's political energy, is an ideal place to be part of American public policy and the institutions and processes through which it is formulated and implemented. At the same time, Washington's rich collection of libraries, museums, theaters and art galleries offers an opportunity to enjoy and explore American cultural life, present and past. Washington's vast financial, technology, and health-related sectors create endless opportunities in those arenas, as well.

In addition to working at a self-selected externship, Cornell in Washington students enroll in one of two core courses—Studies in Public Policy or Studies in the American Experience—that involve a major research project on a topic of their choice. Students also select one or two other seminars from such fields as government, history, economics, history of art, and social policy. All seminars carry appropriate credit toward fulfillment of major, distribution, and other academic requirements.

The program is housed at the Cornell Center, 2148 O Street, NW, Washington, DC 20037. The academic and administrative space is located on the first floor and 27 residential units for approximately 60 students are on the upper floors.

Tuition

Students are registered as full-time students, earn Cornell credit, pay full tuition of their home college, and remain eligible for financial aid.

Housing

Apartments are rented at the Cornell Center. All are fully furnished (except for dishes, cookware, towels, and bedding) and reasonably priced by both Washington and Cornell standards. Two students are assigned to each efficiency and three to each one-bedroom apartment. Students are discouraged from bringing automobiles. The public transportation system, consisting of both bus and subway service, is extensive and convenient to the center, and street parking is not permissible.

Applications

Students may apply online at ciw.cornell.edu or obtain an application from the Cornell in Washington program office at M101 McGraw Hall. Applications should be submitted the semester before participation.

Summer in Washington

A modified program involving courses and internships is available during the summer. Students earn 6 to 8 credits depending on their course selection.

Information

The Cornell in Washington program web site is located at ciw.cornell.edu. Regular information meetings are held on campus in early October and March. These meetings are advertised in the *Cornell Daily Sun* and on campus bulletin boards. Additional information concerning externships, courses, housing, and other features of the program may be obtained at either the Cornell in Washington program office at M101 McGraw Hall, 607-255-4090, or in Washington at the Cornell Center, 2148 O Street, NW, Washington, DC 20037, 202-466-2184.

CORNELL INSTITUTE FOR PUBLIC AFFAIRS

294 Caldwell Hall
255-8018 (tel.)
255-5240 (fax)
cipa@cornell.edu
www.cipa.cornell.edu

The Cornell Institute for Public Affairs (CIPA) offers a university-wide two-year program of graduate professional studies leading to the master of public administration (M.P.A.) degree. CIPA leverages the vast academic and professional resources of Cornell to train the next generation of leaders working at the intersections of the public, private, and nonprofit sectors.

CIPA fellows (graduate students) have the opportunity to study public policy and program management from a cross-disciplinary perspective. Students gain an understanding of the political and administrative processes through which issues, problems, and policies are formulated; the economic and fiscal basis for government action in a market economy; and the analytical tools for assessing policy implications. They study the behavior of both public and private organizations and their management. They also develop sensitivity to the moral and ethical dimensions of policy issues.

Faculty Members

The depth and flexibility of the program is reflected in the growing number of affiliated faculty members. CIPA is not confined within a single school or college, but spans the entire university. More than 100 field faculty members, representing 25 departments, welcome CIPA fellows into their courses and serve on professional report/thesis committees. The core faculty is the heart of the CIPA structure. With broad representation from across the university, the core faculty bring an academic richness to CIPA that transcends disciplinary boundaries. These faculty members provide instruction in the foundation courses. Core faculty members include David B. Lewis, CIPA director, City and Regional Planning; Richard Booth, City and Regional Planning; Nancy Brooks, City and Regional Planning; Nancy Chau, Applied Economics and Management; Gary S. Fields, the John P. Windmuller Chair in International and Comparative Labor; Neema Kudva, City and Regional Planning; (Daniel) Pete Loucks, Civil and Environmental Engineering; Theodore J. Lowi, the John L. Senior Professor of American Institutions in the Department of Government; Kathryn S. March, Anthropology; Norman Uphoff, Government; and Jerome Ziegler,

Department of Policy Analysis and Management.

M.P.A. Program Flexibility

The two-year master of public administration (M.P.A.) degree program consists of 16 courses; CIPA fellows typically take four courses per semester for four semesters. Although the M.P.A. program offers a basic structure for study, each CIPA fellow works closely with a faculty advisor to design an individualized program based on his or her specific area of interest. Courses may be taken through the program in any department or college in the university.

Advising

Upon entering the M.P.A. program, each fellow is assigned a program advisor based on his or her area of interest. These advisors are drawn from the CIPA core faculty. They assist fellows in designing their individual program of study and selecting their courses. The assignment of advisors is meant to assist new students in getting a strong start with their studies. Once familiar with the resources available, students are welcome to ask another core faculty member to be their program advisor.

Toward the end of their first year, when they select their professional report/thesis topic, CIPA fellows choose a report/thesis advisor from among the more than 100 faculty members in the field of public affairs. The advisor guides the fellow in research and writing.

Foundation Course Work

To develop a foundation of basic concepts and capabilities for the study of public policy, CIPA fellows take three courses in each of the following three subject areas:

- Administration, Politics, and Public Policy
- Economics and Public Finance
- Quantitative Analysis

At least one of the three courses in each subject area must be a core foundation course—a course taught by a CIPA core faculty member.

Concentration Course Work

Concentration course work enables fellows to focus on a specific area of public policy study. Students choose their course of study—domestic or international—from the following options:

- Environmental Policy
- Finance and Fiscal Policy
- Government, Politics, and Policy Studies
- Human Rights and Social Justice
- International Development Studies
- Public and Nonprofit Management
- Science and Technology Policy
- Social Policy

Fellows select a concentration during the latter half of the first year of course work.

Practical Experience, Internships, Off-Campus Study, and/or Public Service Exchange

Experiential learning is an integral component of CIPA's educational strategy, and a practical experience such as an internship is a

requirement for obtaining the M.P.A. degree. Internships allow students to apply training in a practical environment and establish contacts for permanent employment. CIPA's Office of Professional Development provides assistance to fellows in finding internships that match their interests, expertise, and professional goals. Appropriate internships are available in public policy— or public affairs—related organizations in both the public and private sector. In recent years, 98 percent of fellows actively searching for an internship find one. Organizations include:

- Deloitte and Touche
- Government Accountability Office
- New York City Office of Management and Budget
- The Overseas Private Investment Corporation
- United Nations
- U.S. Agency for International Development
- U.S. Congress
- U.S. Congressional Research Service
- U.S. Department of State
- World Food Program
- state, local, and urban municipal governments
- nongovernmental organizations and think tanks worldwide
- private sector consulting firms

CIPA fellows also have the opportunity to gain professional experience off-campus, while taking a semester of courses for credit, through the following three programs:

- Cornell in Rome
- Cornell in Washington
- Cornell–Nepal Study Program

In 2008, two additional opportunities for study abroad became available in Mexico City, Mexico, and Budapest, Hungary.

Fellows may also fulfill the practical experience requirement by participating in the Public Service Exchange, a unique service learning partnership with nonprofit and government agencies, providing fellows with the opportunity to engage in the supervised practice of public policy. For more information, see www.pse.cipa.cornell.edu.

Professional Writing Requirement

As a culmination of studies in the M.P.A. program, each fellow develops and submits either a professional report or thesis. Typically, the report or thesis grows out of a fellow's specific area of concentration and often incorporates work done during the summer internship or an off-campus study program. Both the CIPA professional report and the thesis require the student to synthesize and apply his or her education to formulate a solution to a policy problem. The thesis places a greater emphasis on problem definition and literature review, while the professional report emphasizes feasibility, practitioner accessibility, and adapting a student's writing to the professional culture and standard practices of the client organization. The level of work expected for the M.P.A. thesis or professional report is equivalent to one or two semester-long courses.

Co-Curricular Activities

CIPA fellows gain practical skills by organizing, managing, and participating in a variety of professional development activities on campus. These provide fellows with opportunities to share work experience with other fellows, and to meet practitioners and distinguished faculty members in the field of public affairs. These student-led initiatives include:

- **Colloquium Committee:** This student group sets the agenda for the weekly Colloquium Series and makes arrangements for the chosen guest lecturers to come to campus.
- **Point of View (POV):** The CIPA Public Affairs television program, POV is part talk show and part debate show. Fellows work in all aspects of TV production and presentation, gaining invaluable experience for the media exposure they will encounter as public-policy professionals.
- **The Current:** CIPA fellows publish a journal of student policy research. Working on *The Current* offers fellows a firsthand view of the rigors of publishing academic work, and also provides a foundation in professional writing and editing—necessary skills for preparing reports and position papers, and publishing research findings.

Complementary Degrees

CIPA fellows may elect to combine their M.P.A. program with study for a complementary degree such as a J.D. from the Cornell Law School, an M.B.A. from the Graduate School of Management, an M.M.H. from the Hotel School, or an M.R.P. in the field of City and Regional Planning. Admission to the complementary degree program is independent from admission into CIPA.

Accelerated Master's Program

An accelerated program for Cornell undergraduates allows advanced students to apply to CIPA in their junior year, begin CIPA-related course work in their senior year, and complete the M.P.A. in just one year beyond their undergraduate studies.

Residence Requirement

Fellows are required to spend four semesters of study in residence to complete the M.P.A. Those who enroll in the Cornell Accelerated Master's Program can earn the equivalent of two semesters in residence during their senior year.

Admission

The CIPA program seeks diversity in its student body, drawing from a pool of applicants who have studied in a wide range of disciplines. No specific background or undergraduate major is required, although individuals with previous work experience in policy making or implementation are strongly encouraged to apply. Admission to CIPA is selective. A faculty committee evaluates individual applications based on the following:

- overall academic record
- potential for public-policy leadership as evidenced by professional work; community, extracurricular, or other relevant experience (a copy of one's current résumé is an application requirement)

- GRE scores
- two letters of recommendation
- an extensive written statement of purpose, as outlined on the CIPA web site: www.cipa.cornell.edu

Applicants for whom English is a second language will need to achieve the following minimum scores on the new (2005) Internet-based test version of the TOEFL: writing 20, listening 15, reading 20, speaking 22.

Although CIPA has a policy of rolling admission, applications should be submitted by the end of January to be considered for financial aid. For more information, contact the Cornell Institute for Public Affairs, 294 Caldwell Hall (tel: 255-8018; fax: 255-5240; cipa@cornell.edu; www.cipa.cornell.edu).

Financial Aid

CIPA provides some funding to more than 80 percent of its students. The institute itself, however, is unable to provide full support for any individual student. Fellows often win support from Fulbright, Truman, World Bank, and other programs. In addition, Cornell offers numerous assistantship and employment opportunities for graduate students. Applicants are encouraged to explore all available sources of external funding, including grants that may be provided by current employers. Decisions on institute funding are determined on a rolling basis following admission decisions.

CORNELL PLANTATIONS

One Plantations Road
255-2400
plantations@cornell.edu
www.plantations.cornell.edu

Introduction

Cornell Plantations is Cornell University's arboretum, botanic garden, natural areas, and many on-campus gardens—places of exceptional beauty, diversity, and learning opportunities. Areas managed include over 4,000 acres of natural areas on and off campus in addition to the 150 acres in the F. R. Newman Arboretum and the 25 acres of botanical gardens in and around central campus.

Cornell Plantations provides unique outdoor laboratories and plant collections for Cornell's academic programs and research in disciplines such as ecology and evolutionary biology, landscape architecture, ornamental horticulture, and bioengineering. While many of Cornell Plantations' resources are on or near campus, several thousand acres in and around Tompkins County preserve quality examples of native vegetation and rare plants and animals. The lands include bogs, fens, glens, swamps, wet and dry forests, vernal ponds, and meadows. Arrangements to use these natural areas for classes and research can be made by calling Cornell Plantations. Cornell Plantations has something for everyone! We're also the many places that non-horticultural students and faculty members visit for classes ranging from art, literature, and women's issues, to nutrition.

Credit Courses

Cornell Plantations offers two for-credit courses: HORT 4800 Plantations Fall Lecture Series and HORT 4850 Public Garden

Management. HORT 4800 is a 1-credit S-U lecture series offered each fall. HORT 4850 is a 3-credit course offered alternate spring semesters. Cornell Plantations also offers noncredit classes and workshops such as botanical illustration, arts and crafts, gardening techniques, and ecology walks; visit www.plantations.cornell.edu, or call 255-2400 for more information.

Internships

Cornell Plantations' internship program is just for you, the Cornell University student! Since the 1990s, more than 100 university students have been working side by side with Plantations' knowledgeable staff, learning and having fun. A number of positions in various areas are available each year, beginning after finals in May. All positions strive to build on classroom learning through hands-on work, encouraging students' interests in horticulture and the natural world. Visit our web site for details.

Master's Program

Cornell Plantations' master of professional studies program offers fully funded fellowships in public garden leadership. Visit our web site for program details.

Planning a Visit

To discover all that is Cornell Plantations, visit www.plantations.cornell.edu or pick up a visitor's map or a copy of the *Cornell Plantations Path Guide* at the Garden Gift Shop in the Lewis Education Center just below Tower Road. The *Path Guide* and accompanying video are also available at the Cornell Store.

PROGRAM ON ETHICS AND PUBLIC LIFE

240 Goldwin Smith Hall
255-8515

The critical issues of public life are inescapably ethical issues. In the economy, we face questions of equity and justice and questions about the relation between prosperity, the environment, and the quality of individual lives. In constitutional law, we confront dilemmas about civil rights, freedom of speech, privacy, and abortion. In politics and government, we wrestle with questions about campaigning, character, and compromise. And in international affairs, we encounter the complexities of war and peace, human rights, multilateral aid, and climate change.

The university-wide Program on Ethics and Public Life (EPL) is Cornell's initiative in the systematic study of the ethical dimension of specific public issues. EPL grew out of a conviction that these questions need something more than abstract philosophical discussion. In addition to the general study of values and principles that goes on in theoretical ethics, universities need to foster ways of thinking about the complex, uncertain, and urgent problems of the real world, ways of thinking that are realistic without sacrificing their ethical character.

EPL seeks to enhance and facilitate the discussion of ethical issues by students whose central educational interests lie elsewhere, but whose work and lives will nevertheless

confront them with dilemmas and responsibilities for which a university education should prepare them. EPL aims to enrich existing departments with courses that are intellectually and practically fruitful at the same time. It offers a minor in Law and Society (see separate listing under "Special Programs and Interdisciplinary Studies").

For information about the Program on Ethics and Public Life, visit the program's web site, www.arts.cornell.edu/epl.

PROGRAM IN REAL ESTATE

114 West Sibley Hall
255-7110

The two-year master of professional studies in real estate (M.P.S./RE) degree program is an interdisciplinary program that combines courses from nearly every college at Cornell University. The degree is designed for aspiring real estate professionals who are in the initial or early stages of their careers. The Program in Real Estate at Cornell University is home to the graduate program in real estate as well as the Cornell Real Estate Council, which is the centerpoint of academic and industry-related real estate activities on and off campus. The real estate field faculty is composed of 23 faculty members selected from several different colleges that are directly involved in and responsible for the design, delivery, and administration of the real estate curriculum.

The professional study of real estate is concerned with the design, development, finance, law, management, marketing, transactions, deal structuring, and many other aspects of the real estate business. Real estate professionals also contribute an understanding of the long-range social, political, ethical, and environmental implications of decisions about real estate. The 62 credit hours of course work needed to earn the degree provide a comprehensive and lasting foundation for professional careers in real estate.

Students take core courses in principles of real estate, the real estate development process, real estate finance and investments, communication in real estate, managerial finance, residential development, real estate law, construction planning and operations, design in real estate development, transactions and deal restructuring, and real estate marketing and management, along with a weekly industry seminar. Elective courses are taken in a chosen area of concentration and to fulfill a leadership and management distribution requirement. Many concentration options are possible and may be structured from the hundreds of related courses taught at Cornell University. Areas of concentration include development, finance, investments, real estate consulting, sustainable development, property and asset management, real estate marketing and market analysis, international real estate concentrations, and others. Students complete real-world, semester-long project workshops during their second and fourth semesters.

Admissions

Applicants to the Program in Real Estate must have completed a bachelor's degree with a good academic record. Applicants must submit a résumé plus two letters of recommendation either from faculty members familiar with the

applicant's academic work or, if appropriate, professional recommendations based on work experience. Competitive scores for the GMAT are required. Extensive and relevant work experience will receive favorable consideration. International students for whom English is a second language will need to achieve a minimum TOEFL score set by the Cornell Graduate School. There is no work experience required for admission; however, it is strongly preferred that applicants have at least some industry-related work experience, with three to five years' experience typical. Applications are reviewed on a rolling basis. The financial aid priority and dual-degree applicant deadline is January 15, and the regular application deadline is March 15; otherwise, applications will be accepted until June 1. For more information, contact the admissions coordinator at 255-7110 or real_estate@cornell.edu.

SCIENCE OF EARTH SYSTEMS: AN INTERCOLLEGE MAJOR

During the past several decades, with the increasing concern about air and water pollution, nuclear waste disposal, the ozone hole, sufficient natural resources to meet the needs of a rapidly growing world population, and global climate change, the scientific community has gained considerable insight into how the biosphere, hydrosphere, atmosphere, and lithosphere systems interact. Our society is challenged to identify the best path for achieving a sustainable balance between human actions and the natural Earth system. To meet this challenge and to withstand the fundamental process of the Earth system, modern Earth sciences probe the interconnections of the biosphere, hydrosphere, atmosphere, and lithosphere.

The Science of Earth Systems (SES) major emphasizes the rigorous and objective study of the Earth system as one of the outstanding intellectual challenges of modern science and as the necessary foundation for the future management of our home planet. In this program, Cornell's strengths across a broad range of earth and environmental sciences have been coalesced to provide students with the tools to engage in what will be the primary challenge of the 21st century.

Graduates of Cornell's SES program are well prepared for several career and advanced study options:

- Graduate studies leading to the M.S. and/or Ph.D. in any of the earth science sub-disciplines (e.g., atmospheric science, geological sciences/geophysics, biogeochemistry, hydrology, oceanography).
- Employment in environmentally oriented careers in both the private and public sector at the B.S. or B.A. level such as environmental consulting and science writing.
- Employment in natural resources industry, including fossil fuels and water. These fields usually require an M.S. degree.
- Graduate degree in environmental law or policy. These fields value students with an understanding of the science behind legal and policy decisions.

- Advanced degree in teaching, for example, earth science at the middle or high school level.
- Medical school. The emphasis on basic sciences in the SES curriculum makes the SES major a suitable springboard for a career in medicine.

The SES major is available for students in the College of Agriculture and Life Sciences, the College of Engineering, and the College of Arts and Sciences. The SES major has its home in the Department of Earth and Atmospheric Sciences and includes collaboration with several departments across the university.

The SES Curriculum

The SES curriculum provides strong preparation in mathematics, physics, chemistry, and biology during the freshman and sophomore years. In the junior and senior years, students take a set of common SES core courses and an additional set of advanced disciplinary or interdisciplinary courses that build on the basic sequences.

The requirements for the major are as follows:

1. Basic Math and Sciences
 - a. MATH 1110–1120, or MATH 1910–1920
 - b. PHYS 2207–2208, or PHYS 1112–2213
 - c. CHEM 2070–2080 or CHEM 2090–2080 (or 2070–1570)
 - d. one year of biology: BIOG 1101/1103 and 1102/1104 (or 1105–1106) or BIOG 1109 and 1110, or BIOEE/EAS 1540, or EAS 1700
2. Required introductory course: EAS 2200 The Earth System
3. Science of Earth Systems Core Courses

The core courses emphasize the interconnectedness of the Earth system. These courses are founded on the most modern views of the planet as an interactive and ever-changing system, and each crosses the traditional boundaries of disciplinary science. Three courses selected from the following four core courses are required for the major:

 - EAS 3010 Evolution of the Earth System
 - EAS 3030/NTRES 3030 Introduction to Biogeochemistry
 - EAS 3040 Interior of the Earth
 - EAS 3050 Climate Dynamics

4. Concentration Courses

Four intermediate to advanced-level courses (3000 level and up) are selected that build on the core courses and have prerequisites among the "Basic Math and Sciences" courses listed above. Note that additional basic math and science courses may be required as prerequisites for courses chosen for the concentration. These concentration courses build depth and provide the student with specific expertise in some facet of earth system science. Four concentrations are defined for the major: atmospheric sciences, biogeochemistry, geological sciences, and ocean sciences (see EAS web site for details). Other concentrations can be tailored to a student's interests in concert with the student's advisor and upon approval of the SES curriculum committee. Examples include sustainable Earth and environmental systems, earth system science and policy, hydrology, planetary science, and soil science.

5. Field/observational/laboratory experience

Exposure to the basic observations of earth science, whether directly outdoors in the field, or indirectly by various techniques of remote sensing, or in the laboratory, is necessary to understand fully the chosen area of concentration in the major. A minimum of 3 credits of course work of an observational nature is required. Possibilities include:

Courses given in the Hawaii Environmental Semester program;

Courses given by the Shoals Marine Laboratory;

EAS 2500 Meteorological Observations and Instruments;

EAS 3520 Synoptic Meteorology I;

EAS 4170 Field Mapping in Argentina;

EAS 4370 Geophysical Field Methods;

EAS 4910 and/or 4920 Undergraduate Research, total 3 credits with appropriate choice of project;

Field courses taught by another college or university (3-credit minimum)

Cornell Field Program in Earth and Environmental Systems: Semester in Hawaii

Cornell University offers a spring-semester program of environmental and Earth systems study on the Big Island of Hawaii. The Hawaiian Islands are an outstanding natural laboratory where students can explore a variety of ecosystems, examine their development over time, witness human influences on plant and animal communities, and experience geologic processes such as active volcanism and seismicity. Students spend most of their time in the field, gaining hands-on experience probing the interaction between earth, ocean, atmosphere, and biosphere. This is an ideal opportunity to apply fundamental concepts of geology, chemistry, and biology in a real-world setting. Students enrolled in the Environmental Semester Program will complete 19 credit hours of course work during the spring semester. For Cornell students majoring in Science of Earth Systems, EAS 3220, EAS 3400, and EAS 3510 satisfy degree requirements for the major.

For more information contact Professor John Cisne, Department of Earth and Atmospheric Science, john.cisne@cornell.edu, and visit www.eas.cornell.edu.

Business and Preprofessional Study

UNDERGRADUATE BUSINESS STUDY

Cornell offers a highly ranked accredited general undergraduate business degree program as well as world-renowned business-related programs in five other colleges and schools. Because the choices are so broad, students are encouraged to explore the offerings carefully to identify the program that best matches their business career goals. (Graduate study is available in the Johnson Graduate School of Management as well as in

graduate fields associated with each of the undergraduate options.)

Applied Economics and Management The Department of Applied Economics and Management (AEM) in the College of Agriculture and Life Sciences is home to Cornell's only undergraduate degree that is accredited by AACSB International—The Association to Advance Collegiate Schools of Business. AEM's undergraduate program offers a broad, flexible curriculum that reflects the department's analytical, applied economics approach. Students choose among 10 specializations: finance, marketing, strategy, accounting, entrepreneurship, agribusiness management, food industry management, environmental and resource economics, international trade and development, and applied economics (aem.cornell.edu).

Arts and Sciences Many of the liberal arts majors offered by the College of Arts and Sciences provide students with a background for a successful business career. In particular are majors in economics, mathematics, sociology, and psychology. Economics focuses on the production, distribution, and consumption of goods and services; monetary systems; and economic theories. Students interested in the human dimensions of business can choose sociology or psychology. Mathematics majors can choose concentrations in computer science, operations research, statistics, or economics to prepare for careers in areas such as actuarial science or finance (www.arts.cornell.edu).

Engineering Many of today's business managers hold engineering degrees. Each of the College of Engineering's 13 majors prepares students for business careers. Operations Research and Engineering and Information Science, Systems and Technology are the most business-oriented engineering degree programs, preparing graduates for careers in areas such as investment banking and process engineering. Engineering students in any major can take a business-oriented minor in areas such as industrial systems and information technology, and operations research and management science. A new business minor for engineering students is also offered by the Department of Applied Economics and Management (www.engineering.cornell.edu).

Hotel Administration The School of Hotel Administration offers the world's premier hospitality management program. Its rigorous core business curriculum includes courses in finance and accounting; real estate development; facilities management, planning, and design; food and beverage management; marketing, tourism, and strategy; information systems; operations; managerial and organizational behavior; human resource management; managerial communication; and law. The school's 153-room conference hotel gives students the opportunity to apply what they learn in a real-world business and its Practice Credit requirement further ensures a balance between classroom learning and real-world practice (www.hotelschool.cornell.edu).

Human Ecology The College of Human Ecology offers three business-oriented majors. The fiber science and apparel design major prepares students for careers in the fashion industry, for example, as a retail executive or merchandise buyer. Students majoring in design and environmental analysis can choose the facility planning and management option to prepare for careers as facility planners and

workplace strategists in consulting and real estate firms and large corporations. The policy analysis and management major offers concentrations focusing on health, consumer policy, and family and social welfare, and its graduates pursue careers as policy makers, analysts, and managers in both the public and private sectors (www.human.cornell.edu).

Industrial and Labor Relations The School of Industrial and Labor Relations (ILR) focuses on the "people" side of business. Its professional-level curriculum provides a strong social science foundation in organizational behavior; human resource studies; collective bargaining, labor law, and labor history; labor economics; international and comparative labor; and social statistics. Most ILR graduates begin careers in management, consulting, and public policy; four out of 10 graduates go on to law school or other graduate programs (www.ilr.cornell.edu).

Related Areas

Entrepreneurship@Cornell This university-wide program is open to all Cornell students interested in eventually starting their own businesses or working for venture capital firms. Entrepreneurship-related courses are offered by all seven of Cornell's undergraduate colleges and schools as well as by the Johnson Graduate School of Management, the Law School, and the College of Veterinary Medicine (eship.cornell.edu).

International Programs Several additional programs allow business students to focus on a particular geographic area. Majors and concentrations are offered in Latino Studies, French Studies, German Studies, China and Asia-Pacific Studies, Asian Studies, Near Eastern Studies, and Africana Studies (all in the College of Arts and Sciences). The College of Agriculture and Life Sciences offers an interdepartmental program in international agriculture and rural development.

PRELAW STUDY

Law schools do not prescribe any particular prelaw program, nor do they require any specific undergraduate courses as do medical schools. Law touches nearly every phase of human activity, and there is practically no subject that cannot be considered of value to the lawyer. Therefore, no undergraduate course of study is totally inappropriate. Students contemplating legal careers should be guided by certain principles, however, 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. First-year writing seminars, required of nearly all Cornell first-year students, are designed to develop these skills. English literature and composition, and communication courses, also serve this purpose. Logic and mathematics develop exactness of thought. Also of value are economics, history, government, and sociology, because of their close relation to law and their influence on its development and ethics, and philosophy, because of the influence of philosophic reasoning on legal reasoning

and jurisprudence. Psychology and human development lead to an understanding of human nature and mental behavior. Some knowledge of the principles of accounting and of the sciences such as chemistry, physics, biology, and engineering is recommended and will prove of practical value to the lawyer in general practice in the modern world.

3. Cultural subjects, though they may have no direct bearing on law or a legal career, will expand students' interests; help cultivate a wider appreciation of literature, art, and music; and make better-educated and well-rounded persons.
4. Certain subjects are especially useful in specialized legal careers. For some, a broad scientific background—for example, in agriculture, chemistry, physics, or engineering—when coupled with training in law, may furnish qualifications necessary for specialized work with the government, for counseling certain types of businesses, or for a career as a patent lawyer. A business background may be helpful for those planning to specialize in corporate or tax practice. Students who anticipate practice involving labor law and legislation might consider undergraduate study in the School of Industrial and Labor Relations. Whatever course of study is chosen, the important goals are to acquire perspective, social awareness, and a critical cast of mind; to develop the ability to think logically and analytically; and to express thoughts clearly and forcefully. These are the crucial tools for a sound legal education and a successful career.

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

It may be possible for exceptionally well-qualified students in other Cornell undergraduate colleges to apply to enter the Law School after three years. In addition, members of the Cornell Law School faculty sometimes offer undergraduate courses such as *The Nature, Functions, and Limits of Law*, which are open to all undergraduates.

PREMEDICAL STUDY

Medical and dental schools, while not requiring or recommending any particular major course of study, do require that particular undergraduate courses be completed. These courses usually include general chemistry and organic chemistry, biology, and physics, and all must be taken with a lab. A year of English composition (or a first-year writing seminar) is also required. In addition, many medical schools require or recommend mathematics and at least one advanced biological science course, such as biochemistry, genetics, embryology, histology, or physiology.

There is no major that is the best for those considering medical or dental school, and students are therefore encouraged to pursue their own intellectual interests. Students are more likely to succeed at, and benefit from,

subjects that interest and stimulate them, and there is no evidence that medical colleges give special consideration to any particular undergraduate training beyond completion of the required courses. In the past, successful Cornell applicants to medical and dental schools have come from the Colleges of Arts and Sciences, Agriculture and Life Sciences, Human Ecology, and Engineering. The appropriate choice depends to a great extent on the student's other interests.

PREVETERINARY STUDY

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

The college-level prerequisite courses for admission to the College of Veterinary Medicine at Cornell are English composition, biology or zoology, physics, inorganic chemistry, organic chemistry, biochemistry, and microbiology. All science courses must include a laboratory. These requirements, necessary for admission to the College of Veterinary Medicine at Cornell, may vary at other veterinary colleges.

For information on additional preparation, including work experience and necessary examinations, students should consult the brochure, Admissions Information, obtained by writing to the Office of D.V.M. Admissions, College of Veterinary Medicine, Cornell University, S2-009 Schurman Hall, Ithaca, NY 14853-6401. Information on the Guaranteed Admissions Program is available from the same address.

Qualified students in the College of Agriculture and Life Sciences may apply for acceptance in a double-registration program arranged between Cornell University and the College of Veterinary Medicine at Cornell. This program allows registered students to save one year in pursuit of the bachelor's and D.V.M. degrees. Further information about this program is available from the Office of Multicultural and Diversity Programs, College of Agriculture and Life Sciences, 140 Roberts Hall, Ithaca, NY 14853.