

# California Institute of Technology

## Transfer Information

### For which courses does Caltech offer transfer credits?

Caltech does not maintain formal written articulation agreements. It is not possible to inform students before admission which courses they will definitely receive credit for upon transfer. Transfer credits are determined on an individual basis by the faculty at the time of enrollment. Recommended Foothill College courses are outlined in this document. Please see a Foothill College counselor for more details on determining comparable courses.

## Transfer Admissions Information

### Introduction

The Upperclass Admissions Committee at Caltech welcomes applications for transfer admission to the Institute. Previous enrolling transfer classes have contributed much to the campus community, and have also been extraordinarily successful in research and in the classroom. The Admissions Committee seeks to continue this record of success by attracting an accomplished and talented group of transfer students each year in the future. The California Institute of Technology is an independent university located in Pasadena, a city of 134,000, approximately 10 miles from downtown Los Angeles. The Institute provides a research-oriented environment centered around math, science, and engineering.

Caltech has an enrollment of about 900 undergraduate and 1,000 graduate students, and a professorial faculty of nearly 300. Caltech-affiliated scholars have received wide recognition for their distinguished achievements. Twenty-eight Nobel Prizes have been awarded to alumni and faculty: 45 alumni and faculty members have received the National Medal of Science for outstanding contributions to the development of science and engineering; and eight alumni, two trustees, and one faculty member have received the National Medal of Technology. In addition, the current Caltech faculty are well-represented in national honorary societies: 78 are fellows of the American Academy of Arts and Sciences, 67 are members of the National Academy of Sciences, and 32 are members of the National Academy of Engineering.

The following information is for students interested in transferring to the California Institute of Technology. Caltech admits transfer students for the fall term only. They require a completed application, letters of recommendation, an official transcript from the last secondary school attended and all colleges or universities attended, descriptions of all college level math and science courses, and completion of the Caltech Transfer Entrance Examinations. Please review the section titled "Eligibility Criteria for Admission" to determine if you meet the eligibility requirements for transfer admissions consideration. If you have questions about the transfer process, please contact the Admissions Office.

### Areas of Study

All Caltech students take a common core curriculum, described below, that includes math, physics, chemistry, and biology, regardless of their choice of an option (major). Transfer students are expected to have followed the Caltech core curriculum as closely as

possible.

Options offered to undergraduates are: applied and computational mathematics, applied physics, astronomy, biology, business economics and management, chemical engineering, chemistry, economics, electrical and computer engineering, electrical engineering, engineering and applied science (aeronautics, applied mechanics, civil engineering, computer science, environmental engineering science, materials science, and mechanical engineering), geochemistry, geology (including geobiology), geophysics, history, independent studies program, literature, mathematics, physics, planetary science, science, ethics and society (SES), and social science.

### Eligibility Criteria for Admission

The Institute admits to its sophomore and junior classes a small number of students who have excellent records at other college-level institutions. Students must have completed their secondary school education, and have subsequently enrolled at a college or university as a degree-seeking student, in order to be considered for transfer admission. Students who have already completed a bachelor's degree in any subject are not eligible for transfer.

### Admissions Process

The Caltech transfer application is available for downloading from the Admissions Office web site beginning in December. Alternatively, students may write, call, fax or e-mail the Admissions Office to request an application. Applications are available by mail from September through February. It is to the applicant's advantage to return the transfer application for admission as soon as possible. All applications should be in the admissions office by February 15.

The most important criterion for undergraduate admission is strength of academic preparation. In addition, successful applicants will have demonstrated an interest in some area of mathematics, science, or engineering – although outstanding candidates who desire a rigorous education in the humanities or social sciences are also admitted. Applicants for admission are evaluated according to information submitted on the transfer application, college (and, in some cases, high school) course work and grades, recommendations from instructors, and performance on the Caltech Transfer Admissions Entrance Examinations.

Applicants will be notified of the decisions of the Admissions Committee by the first week of May. International students admitted to Caltech who have certified their intent to matriculate, and have submitted all required financial aid forms, will receive an I-20 in June.

### Transfer Admission Profile

Caltech welcomes transfer applications from all regions of the world, and from students in many kinds of post-secondary institutions. Caltech seeks the most qualified students, regardless of the type of institution from which they come. The table below describes a few combined characteristics of the seven most recent transfer applicant pools (Fall 2000

to Fall 2004):

<u>Five-year Totals</u>	<u>Applicants</u>	<u>Admits</u>
Total	956	95
U.S. 2-year institution	310	31
U.S. 4-year institution	371	25
Non-U.S. institution	275	39

### Academic Preparation

The following is an overview of the Caltech core curriculum, taken by all Caltech students during their first two years. It is expected that transfer students will have had exposure to mathematics and physics courses on a comparable level prior to entry to Caltech. Any of the following core courses that have not been covered by incoming transfer students must be taken upon matriculation to Caltech. Humanities and social science courses may cover a broad range of topics; there are no specific course requirements. *However, an evaluation of each transfer student's written English is required prior to registration and may result in an additional course requirement.*

#### *Freshman courses:*

- **Math 1 ABC: Probability and Calculus of One and Several Variables.** Review of calculus; basic probability. Complex numbers, Taylor polynomials, infinite series, basic linear algebra. Derivatives of vector functions, multiple integrals, line and path integrals, theorems of Green and Stokes. Recommended Foothill courses: MATH 1A-B-C-D.
- **Physics 1 ABC: Classical Mechanics and Electromagnetism.** Newtonian mechanics, electricity and magnetism, special relativity. Recommended Foothill courses: PHYS 4A-B-C.
- **Biology 1: Fundamentals of Modern Biology.** A one-term course designed to expose students to the logic of biological experiments, the multiple scales at which issues must be analyzed, and the power of modern biological techniques.
- **Chemistry 1 AB: General Chemistry.** Electronic structure of atoms, periodic properties, ionic substances, covalent bonding, Lewis representations of molecules and ions, shapes of molecules, Lewis acids and bases, Bronsted acids and bases, hybridization and resonance, bonding in solids, chemical equilibria, oxidation and reduction, thermodynamics, kinetics, introduction to organic chemistry and the chemistry of life. Recommended Foothill courses: CHEM 1A-B-C.
- **Chemistry 3A: Fundamental Techniques of Experimental Chemistry.** Introduces the basic principles and techniques of synthesis and analysis and develops the laboratory skills and precision that are fundamental to experimental chemistry.
- **Additional science course** (Currently one of Astronomy 1, Geology 1 or Math 7). Recommended Foothill courses: ASTR 10A/10L or 10B/10L, GEOL 10.
- **Humanities and Social Science electives** (2 or more courses). Recommended: Select from IGETC list.

#### *Sophomore courses:*

- Math 2 AB: Linear Algebra, Statistics, and Differential Equations Linear algebra, basic statistics, ordinary differential equations. Recommended Foothill courses: MATH 2A, 2B.
- Physics 2 AB: Statistical Physics, Waves, and Quantum Mechanics Statistical physics, classical waves, introductory quantum mechanics. Recommended Foothill course: PHYS 4D.

*Or*

- Physics 12 ABC: Waves, Quantum Physics, and Statistical Mechanics For students intending further work in the physics option. Classical waves wave mechanics, interpretation of the quantum wave-function, one-dimensional bound states, scattering, and tunneling; thermodynamics, introductory kinetic theory, and quantum statistics.
- Additional introductory laboratory science. Recommended Foothill course: see IGETC list.
- Humanities and Social Science electives (2 or more courses). Recommended Foothill course: See IGETC List.
- Science communication requirement (emphasizes written and verbal communication). Not currently available at Foothill.
- **Note: It is recommended that students enroll in honors courses seminars to best demonstrate a commitment to challenging themselves as learners. For more information about the Foothill Honors Institute, please access: <http://www.foothill.edu/hon>**

### Test Requirements

#### *SAT/ACT*

Transfer applicants are not required to submit ACT or SAT scores.

#### *TOEFL*

The TOEFL (Test of English as a Foreign Language) is required of transfer applicants who are not citizens or permanent residents of the U.S., and whose native language is not English. The TOEFL should be taken by the January sitting. International students who have studied in the United States for two or more years are exempt from taking the TOEFL.

For TOEFL information use the following:

TOEFL Services  
 Educational Testing Service  
 P.O. Box 6151  
 Princeton, NJ 08541-6151  
 U.S.A.  
 Phone: (609) 771-7100  
 Fax: (609) 771-7500  
 Web site: [www.toefl.org](http://www.toefl.org)  
 E-mail: [toefl@ets.org](mailto:toefl@ets.org)

### Transfer Admissions Entrance Examinations

All applicants are required to take Caltech Transfer Entrance Examinations in

mathematics and physics. An additional examination in chemistry may be required of some students with an expressed interest in Chemistry or Chemical Engineering. These exams are taken after candidates submit a transfer application to Caltech. Instructions for obtaining the examinations will be included in the transfer application packet. Performance on the entrance exams will be evaluated in the context of the applicant's preparation in the field, although one year of university-level mathematics (basic calculus) and physics (mechanics and electromagnetism) are assumed. Further information about topics covered on the examinations will also be included in the application.

Transfer exams must be completed and in the possession of the Caltech Admissions Office by April 15 of the application year. Examinations taken for admission in one year are not considered for admission in any subsequent year.

### Transfer of Credit

The courses for which enrolling transfer students will receive credit will be determined at the time of enrollment. Faculty members review each student's achievement on an individual basis, and after a placement examination has been taken. It is not possible, therefore, to determine in advance the acceptability of course work taken elsewhere.

### Graduation Requirements

- Admitted transfer students must meet the following requirements in order to receive a Caltech Bachelor of Science degree.
- Regardless of the amount of credit awarded upon matriculation, transfer students must spend at least two years (six terms) in residence at Caltech. Students must also earn at least 216 units\* at Caltech, not including courses taken to satisfy math and science core curriculum requirements.
- Students must take, or have taken the equivalent of, all core curriculum courses.
- Students must satisfy all of their chosen option's degree requirements. Transfer students may choose from among all Caltech undergraduate options.
- Note that Caltech calculates course unit values in an unusual fashion. A typical Caltech course (a five-unit course at most American colleges) is worth nine units. 216 Caltech units, therefore, assumes students average four courses per term for two years.

### Financial Aid

Caltech admits students on the basis of academic and personal strengths and accomplishments without regard to their ability to meet the cost of a Caltech education. In addition, Caltech is committed to meeting the full demonstrated financial need of admitted students. In the case of international students, the total amount of funds available is fixed. Financial need, therefore, might be a factor in the admission decision of an applicant who is not a citizen or permanent resident of the United States. To apply for financial assistance, U.S. citizens and permanent residents must submit PROFILE and FAFSA applications <http://profileonline.collegeboard.com> and <http://www.fafsa.ed.gov> Registration for PROFILE should take place by January 15, and the priority date for filing PROFILE and FAFSA applications is March 2. Conditional financial aid awards

will be issued after offers of admission. Awards will then become official after tax returns and all other requested documents are received by the Financial Aid Office, and any necessary award adjustments are made.

### *International Students*

To apply for financial assistance, international transfer admission candidates must submit to the Caltech Financial Aid Office the “International Student Financial Aid Application”. This form will be included in the packet sent to all international students requesting the transfer admissions application. Students who download the application, however, should also download the financial aid application from the Financial Aid Office web site (alternatively they can request postal delivery of the financial aid form from the Caltech Admissions Office by January 15). Applicants must return financial aid forms to Caltech March 2.

**International students who do not apply for financial aid by March 2, or who are denied aid for their first year at Caltech, are not eligible for aid for any other academic period while they are undergraduates at Caltech. (Citizens of Canada and Mexico are exempt from this rule.)** Conditional awards will be issued after offers of admission. Awards will then become official after tax returns and all other requested documents are received by the Financial Aid Office, and any necessary award adjustments are made. Those offered assistance will be eligible to apply for aid in subsequent years.

Students can contact the Financial Aid Office using the following:

Financial Aid Office  
Mail Code 2-94  
Caltech  
Pasadena, CA 91125  
Phone: (626) 395-6280  
Fax: (626) 564-8136  
Web site: [www.finaid.caltech.edu](http://www.finaid.caltech.edu)

### *Expenses*

United States dollar amounts are listed below. A \$50 application fee, or fee waiver request, is also due at the time an application for admission is submitted. The application fee must be a check drawn on a U.S. bank in U.S. dollars. A matriculation (commitment) deposit of \$250 is paid by all applicants who accept our offer of admission. Other expenses include: tuition, other fees, books and supplies, room and board, and miscellaneous personal expenses.

#### Caltech Costs for 2004-2005

##### *Tuition and Fees*

Tuition	\$25,335
Fees	\$231

##### *Estimated Living Expenses*

Room and Board (on campus)	\$8,013
Additional Meals	\$1,926
Books and Supplies	\$1,029
Personal Expenses	\$1,887

### Housing

New transfer students normally live in campus housing, although the availability of such housing does vary from year to year. If sufficient on-campus housing is not available in a particular year, the Caltech Housing Office provides assistance with obtaining housing in the community.

### Visiting Caltech

A student-led tour and admissions information session are available on most weekdays throughout the school year. Tours begin at 1:45 p.m. from the Visitors Center at 315 S. Hill Avenue. The information session begins immediately following the tour. No reservations are required.

### Institute Calendar

Courses are scheduled during the three terms of the academic year, from late September until mid-June. Fall term ends in mid- December, winter term is early January to mid-March, and spring term is early April until mid-June. There is no summer session, although regularly enrolled students often pursue research on campus at this time.

### Additional Information

For further information about Caltech, or its transfer admissions process, please contact the Admissions Office using the following addresses and numbers.

Transfer Information  
Office of Undergraduate Admissions  
Caltech, Mail Code 55-63  
Pasadena, CA 91125  
U.S.A.  
Phone: (626) 395-6341  
Fax: (626) 683-3026  
E-mail: [ugadmissions@caltech.edu](mailto:ugadmissions@caltech.edu)  
Web site: [www.admissions.caltech.edu](http://www.admissions.caltech.edu)