ENGINEERING

CAREER INFORMATION

Engineering is the profession in which knowledge of advanced mathematics and natural sciences gained from higher education, experience, and practice is directed primarily toward the creation of new technology. The following are some of the most popular engineering specialties:

**Aerospace Engineering** – Traditionally the aerospace engineer has been involved with the design and development of high speed vehicles such as aircraft, missiles and spacecraft. In recent years, this list has evolved to include ocean vessels and high speed land vehicles as well.

**Bioengineering** – This specialty involves the optimized development and exploitation of crude oil and natural gas fields, as well as the technical analysis and forecasting of these fields’ future performance.

**Chemical Engineering** – Chemical engineers are involved in the application of the principles of chemistry and engineering to produce useful commodities, ranging from antibiotics to zirconium. Chemical engineers turn the work of chemists and physicists into commercial realities in such fields as pharmaceuticals, electronics, petrochemicals, pollution control, and chemical and nuclear materials.

**Civil Engineering** – Civil engineers are involved in design, construction, or management of such projects as freeways, highways, major buildings, dams, bridges, aqueducts, pipelines, airports, hydro-electric installations, water treatments plants, sewage plants, and etc.

**Computer Engineering** – Computer engineers are involved in design, construction and operation of computer systems. Computer engineering graduates have the potential to work in virtually every industry. Among the majors areas of potential are the computer industry, communications, microelectronics, control systems, computer networking and entertainment industry applications.

**Electrical Engineering** – Electrical engineers design and build communications systems, information processing, entertainment devices, medical diagnosis equipment, robotics control, navigation, and traffic control. Graduates of electrical engineering programs can work in virtually every industry. Among the major employers are electronic manufacturing firm, communications companies, the entertainment industry, public utilities, oil companies, laboratories, transportation companies, and chemical plants. Some graduates pursue professions as technical writers, consultants, teachers or technical sales representatives.

**Environmental Engineering** – Environmental engineering deals with the design and construction of equipment and processes that help reduce or eliminate man-made pollutants in the environment. Environmental engineers work in many areas, including alternate fuel vehicles, renewable energy resources, sold waste collection and disposal, municipal and industrial water and wastewater treatment, air pollution control, and hazardous waste management.

**Industrial Engineering** – Industrial engineers use engineering principles to design, develop, implement and improve integrated systems that include people, materials, information, equipment and energy. As problem solvers, industrial engineers are equipped with practical and scientific tools to tackle complex industrial problems and to increase the productivity of workers, capital and facilities.

**Materials Engineering** – Materials engineering is the study of manipulation of the atomic and molecular structure of substances to create products such as computer chips and television screens to golf clubs and snow skis.

SEE REVERSE SIDE FOR ADDITIONAL REQUIREMENTS
Mechanical Engineering – Mechanical engineering is the broadest engineering specialty. Mechanical engineering designs and manufacture machines that move and lift loads, transport people and goods, and produce energy and convert it to other forms. They the technical experts who design and develop such as automobiles, engines, aircraft and space vehicles, power plants, heating an cooling systems, gas and steam turbines, servomechanism, transmissions, robots, and manufacturing production lines. They use scientific knowledge to create new and useful designs and to harness various types of energy, such as chemical, nuclear, or thermal.

GENERAL INFORMATION

Not all universities with this major are listed below. The lower division core preparation is listed for universities with which LBCC has established articulation agreements. The first course listed is the LBCC course; the course in parentheses immediately after is the university equivalent. It is generally recommended to take as many lower-division major courses as possible prior to transfer. Please check www.assist.org for the most current articulation information and information regarding minimum grade for each course, impacted major recommendations, application procedures, etc. Moreover, you must see a counselor to develop an accurate educational plan to ensure your competitiveness for admissions for your school(s) of choice. To thoroughly understand admissions and general education requirements please check the catalog of the transfer university. CSU/UC admissions and general education requirements are outlined on a separate curriculum guide.

*** Schools are listed in alphabetical order ***

CSU CHICO

- **B.S. Degree – Civil Engineering**
  Bio 41 & 41L (Biol 8); Chem 1A (Chem 37); Engr 17 & 17L (Ece 95 & 95L), 35 (CE 35); Math 60 (Math 7A), 70 (7B), 80 (7C); Physics 3A & 3B & 3C (Phys 4A & 4B & 4C)
  One course from: Bio 2 (Biol 11); Chem 1B (Chem 38); Geol 1 or 1H or 2 & 2H (Geos 2)
  (No LBCC equivalents to the following CSUC courses: CE 10, 11, 20; Math 7D; ME 25, 45)

- **B.S. Degree – Computer Engineering**
  Chem 1A (Chem 37); Engr 17 & 17L (Ece 95 & 95L); Math 60 (Math 7A), 70 (7B), 80 (7C), 85; Physics 3A & 3B & 3C (Phys 4A & 4B & 4C)
  (No LBCC equivalents to the following CSUC courses: Csci 15B; Ece 84, 86, 90; Math 7D)

- **B.S. Degree – Electrical Engineering**
  Bio 41 & 41L (Biol 8); Chem 1A (Chem 37); Engr 17 & 17L (Ece 95 & 95L); Math 60 (Math 7A), 70 (7B), 80 (7C); Physics 3A & 3B & 3C (Phys 4A & 4B & 4C)
  (No LBCC equivalents to the following CSUC courses: Ece 84, 86, 90; Math 7D)

- **B.S. Degree – Mechanical Engineering**
  Bio 41 & 41L (Biol 8); Chem 1A (Chem 37); Engr 17 & 17L (Ece 95 & 95L), 35 (CE 35); Math 60 (Math 7A), 70 (7B), 80 (7C); Physics 3A & 3B & 3C (Phys 4A & 4B & 4C)
  (No LBCC equivalents to the following CSUC courses: Math 7D; ME 25, 38, 45; Mfgt 51)

- **B.S. Degree – Mechatronic Engineering**
  Bio 41 & 41L (Biol 8); Chem 1A (Chem 37); Engr 17 & 17L (Ece 95 & 95L), 35 (CE 35); Math 60 (Math 7A), 70 (7B), 80 (7C); Physics 3A & 3B & 3C (Phys 4A & 4B & 4C)
  (No LBCC equivalents to the following CSUC courses: Ece 84, 90; Math 7D; ME 25, 45)

SEE NEXT PAGE FOR ADDITIONAL REQUIREMENTS
CSU LONG BEACH

- **B.S. Degree – Aerospace Engineering**
  Chem 1A (Chem 111A); Engr 3B (ME 172), 17 (EE 211), 17L (211L), 35 (CE 205); Math 60 (Math 122), 70 (123), 80 (224); Physics 3A (Phys 151) 3B (152)
  No LBCC equivalencies to CSULB courses: AE 101; CECS 174

- **B.S. Degree – Chemical Engineering**
  Bio 1A (Biol 211A) or 2 (Micro 200); Chem 1A (Chem 111A), 1B (111B); Engr 17 (EE 211); 35 (CE 205), 54 (CE 206); Math 60 (Math 122), 70 (123), 80 (224); Physics 3A (Phys 151), 3B (152).
  No LBCC equivalents to the following CSULB course: Chem 200, 210, 220, 251; Engr 101

- **B.S. Degree – Civil Engineering**
  Bio 2 (Micro 200); Chem 1A (Chem 111A); Engr 3B (ME 172), 35 (CE 205), 17 (EE 211) 54 (CE 206);
  Math 60 (Math 122), 70 (123), 80 (224); Physics 3A (Phys 151) 3B (152)
  No LBCC equivalents to the following CSULB courses: CE 225

- **B.S. Degree – Computer Engineering**
  Math 60 (Math 122), 70 (123), 80 (224); Physics 3A (Phys 151), 3B (152).
  No LBCC equivalents to the following CSULB courses: CECS 174, 201, 228, 261, 281, 274

- **B.S. Degree – Electrical Engineering**
  Engr 17 (EE 211), 17L (211L); Math 60 (Math 122), 70 (123), 80 (224); Phys 3A (Phys151) 3B (152)
  No LBCC equivalents to the following CSULB courses: CECS 174; EE 200, 201, 210, 210L; Engr 202; Phys 254

- **B.S. Degree – Engineering**
  Option: Biomedical and Clinical Engineering
  Chem 1A (Chem 111A); Engr 17 (EE 211), 17L (211L); Math 60 (Math 122), 70 (123), 80 (224);
  Physics 3A (Phys 151), 3B (152)
  No LBCC equivalents to the following CSULB courses: CECS 174; EE 200, 201; Engr 202; Phys 254

- **B.S. Degree – Mechanical Engineering**
  Chem 1A (Chem 111A); Engr 3B (ME 172), 17 (EE 211), 17L (211L), 35 (CE 205); Math 60 (Math 122), 70 (123), 80 (224); Physics 3A (Phys 151), 3B (152).
  No LBCC equivalents to the following CSULB course: Engr 101; ME 205, 272

CSU SACRAMENTO

- **B.S. Degree – Engineering**
  Chem 1A (Chem 1A); Engr 17 (17), 35 (30); Math 60 (Math 30), 70 (31), 80 (32), 84 or 85 (45)
  (No LBCC equivalents to the following CSUS courses: Engr 4, 6, 45, 70; Phys 11A, 11B, 11C; Csc 25; Engl 20; CE 9; CPE/EEE 64; ME 37, 75)

SEE REVERSE SIDE FOR ADDITIONAL REQUIREMENTS
UC BERKELEY  (IGETC Not Recommended)

- **B.S. Degree – Bioengineering**
  This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are not considered to be “work in progress” for fall selection purposes.

  The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

  **Requirements**:  Chem 1A (Chem 1A), 12A (3A); Engl 1 (English R1A); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B), 3C (7C)
  (No LBCC equivalents to the following UC Berkeley courses:  Biology 1A, 1B; CompSci 61A; Engin 45, 77N; El Eng 40)

- **B.S. Degree – Chemical Engineering**
  This major is offered by the College of Chemistry. Transfer students are expected to complete, at minimum, one year of chemistry, a computer programming course for science or engineering students, one year of calculus, one semester of physics, and English Composition by the end of the spring term that precedes fall enrollment at Berkeley.

  **Requirements**:  CBIS 11 or 12 or ENGR 58; Chem 1A (Chem 1A), 1B (1B); Engl 1 (English R1A); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B), 3C (7C)
  (No LBCC equivalents to the following UC Berkeley courses:  Chem 112A, 112B; El Eng 40, 100; Engin 45, 77N; CompSci 61A)

  Completion of a year of organic chemistry combined with a score in the 75th percentile or higher on the American Chemical Society (ACS) Organic Chemistry Exam will constitute satisfactory completion of Berkeley’s CHEM 112A & 112B (upper division courses required for the major). Students are encouraged to take the exam through their community college if possible.

- **B.S. Degree – Civil and Environmental Engineering**
  This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are not considered to be “work in progress” for fall selection purposes.

  The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

  **Requirements**:  Chem 1A (Chem 1A); Engl 1 (English R1A); Engr 3A & 3B (Engin 28), 35 (36); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B); Physics 3C or Chem 1B (Physics 7C or Chem 1B)
  (No LBCC equivalents to the following UC Berkeley courses:  Civ Eng 60, 70; Engin 11, 77N)

- **B.S. Degree – Computational Engineering Science**
  This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are not considered to be “work in progress” for fall selection purposes.

SEE NEXT PAGE FOR ADDITIONAL REQUIREMENTS
The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

Requirements: Chem 1A (Chem 1A), 1B (1B); Engl 1 (English R1A); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B), 3C (7C)
(No LBCC equivalents to the following UC Berkeley courses: Biology 1A; CompSci 61B; Math 55; Engin 45, 77N)

B.S. Degree – Electrical Engineering & Computer Science
This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are not considered to be “work in progress” for fall selection purposes.

The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

Requirements: Engl 1 (English R1A); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B)
One course from: Chem 1A (Chem 1A), 1B (1B), 12A (3A), 12B (3B); Physi 1 (MCellBi 32 & 32L); Physics 3C (Physics 7A)
(No LBCC equivalents to the following UC Berkeley courses: Biology 1A, 1B; El Eng 20N, 40; CompSci 61A, 61B, 61C; Math 55; Chem 5; Stat 20, 25)

Recommended: Engr 17, 17L. (Students should take an introductory course in electronics. Once at Berkeley, the electronic courses will be evaluated to determine whether the student will need to take EE 40 or supplementary course work at Berkeley.)

B.S. Degree – Electrical Engineering & Computer Science
The College of Engineering is aware that very little articulation exists for Berkeley’s computer science 61A-61B-61C series, with the exception of 61B, for which two courses frequently are required for Berkeley’s one course. If your major requires 61B or 61C, you are advised to take UC-transferable courses in data structures or assembly language, as well as a course in machine structures, even if these courses may not be comparable to Berkeley’s courses, and to take courses in C++ and Java, if available.

B. S. Degree – Industrial Engineering & Operations Research
This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are not considered to be “work in progress” for fall selection purposes.

The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

SEE REVERSE SIDE FOR ADDITIONAL REQUIREMENTS
UC Berkeley (continued)

Requirements: Chem 1A (Chem 1A); Engr 3A & 3B (Engin 28), 35 (36); Engl 1 (English R1A); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B)
(No LBCC equivalents to the following UC Berkeley courses: Engin 77N; Civ Eng 70; El Eng 20N, 40, 45)

Recommended: Engr 17, 17L. (Students should take an introductory course in electronics. Once at Berkeley, the electronic courses will be evaluated to determine whether the student will need to take EE 40 or supplementary course work at Berkeley.)

• B.S. Degree – Manufacturing Engineering
This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are not considered to be “work in progress” for fall selection purposes.

The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

Requirements: Chem 1A (Chem 1A); Engr 3A & 3B (Engin 28), 35 (36); Engl 1 (English R1A); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B); 4 additional units of engineering, math or a physical science course
(No LBCC equivalents to the following UC Berkeley courses: Engin 45, 77N; El Eng 100)

• B. S. Degree – Materials Science and Engineering
This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are not considered to be “work in progress” for fall selection purposes.

The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

Requirements: Chem 1A (Chem 1A), 1B (1B); Engl 1 (English R1A); Engr 35 (Engin 36); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B), 3C (7C)
(No LBCC equivalents to the following UC Berkeley courses: Engin 45, 77N)

• B.S. Degree – Mechanical Engineering
This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are not considered to be “work in progress” for fall selection purposes.

The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

Requirements: Chem 1A (Chem 1A); Engl 1 (English R1A); Engr 3A & 3B (Engin 28), 35 (36); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B); Physics 3C or Chem 1B (Physics 7C or Chem 1B)
(No LBCC equivalents to the following UC Berkeley courses: Biology 1A; Engin 45, 77N)

SEE NEXT PAGE FOR ADDITIONAL REQUIREMENTS
UC Berkeley (continued)

- **B. S. Degree – Nuclear Engineering**
  This major is offered by the College of Engineering. The College selects applicants for admission primarily based upon their strength of academic preparation and GPA. Applicants who have a high GPA but are missing important requirements will have difficulty being selected. Summer courses are **not** considered to be “work in progress” for fall selection purposes.

  The UC application essay plays an important role in the selection process at Berkeley. In this essay, students should state why they are interested in the field of engineering and in their chosen major.

  **Requirements:** Chem 1A (Chem 1A), 1B (1B); Engl 1 (English R1A); Math 60 (Math 1A), 70 (1B), 80 (53), 84 (54); Physics 3A (Physics 7A), 3B (7B), 3C (7C)
  (No LBCC equivalents to the following UC Berkeley courses: El Eng 40, 100; Engin 45, 77N)

  **Recommended:** Engr 17, 17L. (Students should take an introductory course in electronics. Once at Berkeley, the electronic courses will be evaluated to determine whether the student will need to take EE 40 or supplementary course work at Berkeley.)

UC DAVIS (IGETC Not Recommended)

- **B.S. Degree – Aeronautical Science & Engineering**
  CBIS 11 or 12 (Eng Cs 30 or 40); Chem 1A & 1B (Chem 2A & 2B); Engl 1 or 1H or 2 (English 1 or 3); Engr 3A & 3B or 3B (Engin 4), 17 & 17L (17), 35 (35); Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C); Sp 10 (Comm 1)
  **Recommended:** Physics 3C (Physics 9B)
  (No LBCC equivalents to the following UCD courses: Engin 5, 6, 45; Comm 3; Physics 9D)

- **B.S. Degree – Biological Systems Engineering**
  Bio 1A (Biolsci 1A), 1B (1B); CBIS 11 (Eng Cs 30); Chem 1A & 1B (Chem 2A & 2B), 12A & 12B (118B); Engl 1 or 1H or 2 (English 1 or 3); Engr 17 & 17L (Engin 17), 35 (35); Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C), 3C (9B); Sp 10 (Comm 1)
  **Recommended:** Phys 3C (Physics 9B)
  (No LBCC equivalents to the following UCD courses: Chem 8A, 8B; Eng Rs 1, 75; Eng Civ 10; Engin 5; Comm 3)

- **B.S. Degree – Chemical Engineering**
  CBIS 11 or 12 (Eng Cs 30 or 40); Chem 1A & 1B (Chem 2A & 2B & 2C), 12A & 12B (128A & 128B & 129A); Engl 1 or 1H or 2 (English 1 or 3); Engr 17 & 17L (Engin 17), 35 (35); Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C); Sp 10 (Comm 1)
  **Recommended:** Phys 3C (Physics 9B)
  (No LBCC equivalents to the following UCD courses: Chem 2AH, 2BH, 2CH; Engin 5, 6; Comm 3)

- **B.S. Degree - Civil Engineering**
  CBIS 11 or 12 (Eng Cs 30 or 40); Chem 1A & 1B (Chem 2A & 2B); Engl 1 or 1H or 2 (English 1 or 3); Engr 17 & 17L (Engin 17), 35 (35); Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C); Sp 10 (Comm 1)
  **Recommended:** Phys 3C (Physics 9B)
  (No LBCC equivalents to the following UCD courses: Eng Civ 10; Engin 5, 6; Comm 3; Physics 9D)

SEE REVERSE SIDE FOR ADDITIONAL REQUIREMENTS
UC Davis (continued)

- **B.S. Degree - Computer Engineering**
  CBIS 11 (Eng Cs 30), 12 (40), 37 (Eng E & C 70 or Eng Cs 50); Math 55B (Eng Cs 20); Chem 1A (Chem 2A); Engl 1 or 1H or 2 (English 1 or 3); Engr 17 & 17L (Engin 17); 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C); 3C (9B); Sp 10 (Comuncn 1)
  (No LBCC equivalents to the following UCD courses: Engin 6; Comuncn 3; Physics 9D)

- **B.S. Degree - Computer Science & Engineering**
  CBIS 11 (Eng Cs 30), 12 (40), 37 (Eng E & C 70 or Eng Cs 50); Math 55B (Eng Cs 20); Chem 1A (Chem 2A); Engl 1 or 1H or 2 (English 1 or 3); Engr 17 & 17L (Engin 17); Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C), 3C (9B); Sp 10 (Comuncn 1)
  **Recommended:** Phys 3C (Physics 9B)
  (No LBCC equivalents to the following UCD courses: Comuncn 3; Physics 9D)

- **B.S. Degree - Electrical Engineering**
  Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C), 3C (9B); Chem 1A (Chem 2A); Engr 17 & 17L (Engin 17); CBIS 11 (Eng Cs 30), 12 or 14A (40 or 73), 37 (Eng E & C 70 or Eng Cs 50); Engl 1 or 1H or 2 (English 1 or 3); Sp 10 (Comuncn 1)
  (No LBCC equivalents to the following UCD courses: Comuncn 3; Engin 6; Physics 9D)

- **B.S. Degree – Materials Science & Engineering**
  CBIS 11 or 12 (Eng Cs 30 or 40); Chem 1A & 1B (Chem 2A & 2B); Engl 1 or 1H or 2 (English 1 or 3); Engr 3A & 3B or 3B (Engin 4), 17 & 17L (17), 35 (35); Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C); Sp 10 (Comuncn 1)
  **Recommended:** Phys 3C (Physics 9B)
  (No LBCC equivalents to the following UCD courses: Comuncn 3; Engin 5, 6, 45)

- **B.S. Degree – Mechanical Engineering**
  CBIS 11 or 12 (Eng Cs 30 or 40); Chem 1A & 1B (Chem 2A & 2B); Engl 1 or 1H or 2 (English 1 or 3); Engr 3A & 3B or 3B (Engin 4), 17 & 17L (17), 35 (35); Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C); Sp 10 (Comuncn 1)
  **Recommended:** Phys 3C (Physics 9B)
  (No LBCC equivalents to the following UCD courses: Comuncn 3; Eng Mec 50; Engin 5, 6, 45; Physics 9D)

- **B.S. Degree – Optical Science and Engineering**
  CBIS 11 or 12 (Eng Cs 30 or 40); Chem 1A (Chem 2A); Engl 1 or 1H or 2 (English 1 or 3); Engr 17 & 17L (Engin 17); Math 60 (Math 21A), 70 (21B), 80 (21C or 21D), 84 (22A or 22B); Physics 3A (Physics 9A), 3B (9C), 3C (9B); Sp 10 (Comuncn 1).
  (No LBCC equivalents to the following UCD courses: Comuncn 3; Eng Asd 1; Engin 5, 6; Physics 9D)

**UC IRVINE (IGETC Not Recommended)**
Preference will be given to junior-level applicants with the highest cumulative grade point average, and who have satisfactorily completed the following required courses: one year of calculus, one year of engineering physics (with lab), one year of general chemistry (with lab), and one course in computational methods (FORTRAN, Pascal, C or C++).

SEE NEXT PAGE FOR ADDITIONAL REQUIREMENTS
UC Irvine (continued)

- **B.S. Degree – Aerospace Engineering**
  Chem 1A & 1B (Chem 1A & 1LA & 1B & 1LB); Engr 17 & 17L (Engrece 70A), 35 (Engrmae 30); Math 60 & 70 & 80 (Math 2A & 2B & 2D), 84 (3D); Phys 3A & 3B & 3C (Physics 7A & 7LA & 7B & 7LB & 7D & 7LD & 7E)
  One course from: CBIS 11 or 12 or Engr 54 (Engrmae 10)
  (No LBCC equivalents to the following UCI courses: Engrmae 80, 91)

- **B.S. Degree – Chemical Engineering**
  Chem 1A & 1B (Chem 1A & 1LA & 1B & 1LB & 1C), 12A & 12B (51A & 51LA & 51B & 51BL & 51C); Math 60 & 70 & 80 (Math 2A & 2B & 2D), 84 (3D); Phys 3A & 3B (Physics 7A & 7LA & 7B & 7LB & 7LD)
  One course from: CBIS 11 or 12 or Engr 54 (Engrmae 10)
  (No LBCC equivalents to the following UCI courses: Cbems 40A, 40B; Math 2E)

- **B.S. Degree – Civil Engineering**
  Chem 1A & 1B (Chem 1A & 1LA & 1B & 1LB & 1C) or Phys 3B (Physics 7D & 7LD); Engr 17 & 17L (Engrece 70A), 35 (Engrmae 30); Math 60 & 70 & 80 (Math 2A & 2B & 2D), 84 (3D); Phys 3A & 3B (Physics 7A & 7LA & 7B & 7LB & 7D & 7LD); CBIS 12 (Engrece 20); Geol 1 or 1H or 2 or 3 or 3H (Earthss 14)
  One course from: Phys 3C (Physics 7E) or Chem 1A & 1B (Chem 1B & 1LB & 1C) or Bio 1A (Bio Sci 94 or Earthss 10)
  One course from: CBIS 11 or Engr 54 (Engrmae 10)
  (No LBCC equivalents to the following UCI courses: Earthss 15, 20E, 20F; Engrcee 11; Engrcee 80, 81A, 81B)

- **B.S. Degree – Computer Engineering**
  CBIS 11 or 12 (Engrmae 10 or 20); Chem 1A (Chem 1A or Physics 51A); Engr 17 & 17L (Engrece 70A); Math 60 & 70 & 80 (Math 2A & 2B & 2D), 84 (3D); Phys 3A & 3B & 3C (Physics 7A & 7LA & 7B & 7LB & 7D & 7LD & 7E); Bio 1A (Bio Sci 94 or Earthss 10) or Phys 3C (Physics 7E)
  (No LBCC equivalents to the following UCI courses: Engrece 70B, 70LB; I & C Sci 23; Math 6A)

- **B. S. Degree – Electrical Engineering**
  CBIS 11 (Engrece 10), 14A (40); Chem 1A (Chem 1A & 1LA); Engr 17 & 17L (Engrece 70A); Math 60 & 70 & 80 (Math 2A & 2B & 2D), 84 (3D); Phys 3A & 3B & 3C (Physics 7A & 7LA & 7B & 7LB & 7D & 7LD & 7E)
  (No LBCC equivalents to the following UCI courses: Engr 54, 80; Engrce 31A, 31LA; 70B; 70LB; Math 2E; Physics 51A, 51B, 52C)

- **B.S. Degree – Mechanical Engineering**
  Chem 1A & 1B (Chem 1A & 1LA & 1B & 1LB); Engr 17 & 17L (Engrece 70A), 35 (Engrmae 30); Tec 60 (Engrmae 52); Math 60 & 70 & 80 (Math 2A & 2B & 2D), 84 (3D); Phys 3A & 3B & 3C (Physics 7A & 7LA & 7B & 7LB & 7D & 7LD & 7E)
  One course from: CBIS 11 or 12 or Engr 54 (Engrmae 10)
  (No LBCC equivalents to the following UCI courses: Engrmae 80, 91; Math 2E)

SEE REVERSE SIDE FOR ADDITIONAL REQUIREMENTS
UC LOS ANGELES (IGETC Not Recommended)
Admission to the engineering major as a junior level transfer is quite competitive. The University requires applicants to have completed a minimum of 60 transferable semester units and two transferable English courses, prior to enrolling at UCLA. In addition, all applicants to the School of Engineering and Applied Science (SEAS) majors must have at least a 3.2 GPA in their college work. Many of the majors in the SEAS are impacted. Excellent grades, especially for courses in preparation for the major, are expected.

Applicants are expected to have completed all major preparation courses. SEAS accepts transfer applications for fall and winter quarters. Because completion of the required preparatory courses is critical for admission, students should apply for the term following the semester in which they will finish these requirements.

- **B.S. Degree – Aerospace, Chemical, Civil, Computer Science & Engineering, Electrical, Materials, and Mechanical Engineering.**

  Chem 1A & 1B (Chem 20A & 20B & 20L & 30AL); Engl 1 or 1H (Engcomp 3); Math 60 (Math 31A) 70 (31B) 80 (32A & 32B) 84 (33A); Phys 3A & 3B & 3C (Physics 1A & 1B & 1C & 4BL)

UC RIVERSIDE (IGETC Not Recommended)
Applicants to this major are accepted for fall quarter only. Engineering is a “selecting major” at UCR. Students should complete all the lower division major preparation requirements.

- **B.S. Degree – Chemical Engineering**

  Chem 1A & 1B (Chem 1A & 1B & 1C), 12A & 12B (one year of organic chemistry); CBIS 11 (CS 10); Engl 1 or 1H and either 2 or 3 or 3H (Engl 1A & 1B & 1C); Math 60 & 70 (Math 9A & 9B & 9C), 80 (10A or 10B); Phys 3A & 3B (Phys 40A & 40B & 40C)

  **Recommend prior to transfer:** Bio 1A (Biol 5A & 5AL & Chem 5)

- **B.S. Degree – Computer Engineering**

  CBIS 11 (CS 10), 12 (12); Engl 1 or 1H; 2 or 3 or 3H (Engl 1A & 1B & 1C); Engr 17 & 17L (EE 1A & 1LA); Math 60 & 70 (Math 9A & 9B & 9C); Phys 3A & 3B (Phys 40A & 40B & 40C)

  **Recommend prior to transfer:** Chem 1A (Chem 1A); Math 80 (Math 10A or 10B)

  (No LBCC equivalents to the following UCR courses: CS 14, 61; EE 1B; Math 46)

- **B.S. Degree – Electrical Engineering**

  CBIS 11 (CS 10); Engl 1 or 1H; 2 or 3 or 3H (Engl 1A & 1B & 1C); Engr 17 & 17L (EE 1A & 1LA); Math 60 & 70 (Math 9A & 9B & 9C); 80 (10A or 10B); Phys 3A & 3B (Phys 40A & 40B & 40C)

  **Recommend prior to transfer:** Bio 1A (Biol 5A & 5AL) or 41/41L or 41H/41L (2 or 3); Chem 1A (Chem 1A); Engr 35 (ME 10)

  (No LBCC equivalents to the following UCR courses: CS 61; Math 46; EE 1B)

- **B.S. Degree – Mechanical Engineering**

  Chem 1A & 1B (Chem 1A & 1B & 1C); CBIS 11 (CS 10); Engl 1 or 1H, 2 or 3 or 3H (Engl 1A & 1B & 1C); Engr 35 (ME 10); Math 60 & 70 (Math 9A & 9B & 9C), 80 (10A or 10B); Phys 3A & 3B (Phys 40A & 40B & 40C)

  **Recommended prior to transfer:** Bio 1A (Biol 5A & 5AL) or 41/41L or 41H/41L (2 or 3); Engr 17 & 17L (EE 1A & 1LA); Stat 1 or 1H (Stat 40)

  (No LBCC equivalents to the following UCR courses: Math 46; ME 9, 14)

SEE NEXT PAGE FOR ADDITIONAL REQUIREMENTS
**UC SANTA CRUZ**  (IGETC Not Recommended)

- **B.S. Computer Engineering**
  Chem 1A (Chem 1B & 1M) or 2 (1A); Math 60 & 70 (Math 19A & 19B), 80 (22), 84 (27); Physics 3A & 3B & 3C (Phys 5A & 5L & 5B & 5M & 5C & 5N)
  (No LBCC equivalents to the following UCR courses: Cmpe 12C, 12L, 16)

**UNIVERSITY OF THE PACIFIC, SCHOOL OF ENGINEERING**

* **B.S. in Civil Engineering, Computer Engineering, Electrical Engineering, Engineering Management, Engineering Physics, Mechanical Engineering.**

Requirements: Chem 1A; Math 60, 64, 70, 80, 84; Phys 3A, 3B
One course from: CBIS 9, 11, 12; Engr 54, 58

Note:  
(1) Engr 3B is not required for Electrical, Computer and Engineering Physics majors.  
(2) Chem 1A is not required for Engineering Physics majors.  
(3) CBIS 12 required for Electrical and Computer majors

**UNIVERSITY OF SOUTHERN CALIFORNIA**

Students should complete a minimum of 30 transferable semester units with a minimum GPA of 3.0 to be competitive for transfer admission. The School of Engineering expects its transfer students to have completed at least half of the engineering core courses listed in this guide. In general, students who have completed a greater number of core courses will be more competitive for admission. Note that USC does not require completion of GE requirements for admission, but every student should complete English 1 & 2 or 3 before transferring.

- **B.S. Degree - Aerospace Engineering**
  Chem 1A; Engl 1 or 1H, 2 or 3 or 3H; Engr 54, 3A, 35, 50; Math 60, 70, 80, 85; Physics 3A, 3B, 3C

- **B. S. Degree – Biomedical Engineering**
  Biol 1A, 1B; CBIS 12; Chem 1A, 1B, 12A, 12B; Engl 1 or 1H, 2 or 3 or 3H; Engr 17, 17L, 50; Math 60, 70, 80, 85; Physics 3A, 3B, 3C

- **B.S. Degree – Biomedical / Electrical Engineering**
  Biol 1A, 1B; CBIS 12; Chem 1A, 1B, 12A; Engl 1 or 1H, 2 or 3 or 3H; Engr 17, 17L, 50; Math 60, 70, 80, 85; Physics 3A, 3B, 3C

- **B. S. Degree – Biomedical / Mechanical Engineering**
  Biol 1A, 1B; CBIS 12; Chem 1A, 1B, 12A; Engl 1 or 1H, 2 or 3 or 3H; Engr 17, 17L, 50; Math 60, 70, 80, 85; Physics 3A, 3B, 3C

- **B. S. Degree – Biomedical / Biochemical Engineering**
  Biol 1A, 1B; CBIS 12; Chem 1A, 1B, 12A, 12B; Engl 1 or 1H, 2 or 3 or 3H; Engr 17, 17L, 35, 50; Math 60, 70, 80, 85; Physics 3A, 3B

- **B.S. Degree – Civil Engineering**
  Chem 1A; Engl 1 or 1H, 2 or 3 or 3H; Engr 3A, 17, 17L, 35, 50, 54; Math 60, 70, 80, 85; Physics 3A, 3B, 3C or Chem 1B
• **B. S. Degree – Chemical Engineering**  
  CBIS 12; Chem 1A, 1B, 12A, 12B; Engl 1 or 1H, 2 or 3 or 3H; Engr 35, 50; Math 60, 70, 80, 85; Physics 3A, 3B

• **B. S. Degree – Chemical / Biochemical Engineering**  
  CBIS 12; Chem 1A, 1B, 12A; Engl 1 or 1H, 2 or 3 or 3H; Engr 50; Math 60, 70, 80, 85; Physics 3A, 3B

• **B. S. Degree – Computer Engineering**  
  CBIS 12; Engl 1 or 1H, 2 or 3 or 3H; Engr 17, 17L, 50; Math 60, 70, 80, 84; Physics 3A, 3B, 3C or Chem 1A

• **B. S. Degree – Electrical Engineering**  
  CBIS 12; Chem 1A; Engl 1 or 1H, 2 or 3 or 3H; Engr 17, 17L, 35, 50; Math 60, 70, 80, 85; Physics 3A, 3B, 3C

• **B. S. Degree – Environmental Engineering**  
  Biol 1A; Chem 1A, 1B, 12A; Engl 1 or 1H, 2 or 3 or 3H; Engr 54, 35, 50; Math 60, 70, 80, 85; Physics 3A, 3B

• **B. S. Degree – Industrial and Systems Engineering**  
  CBIS 12; Chem 1A; Econ 1B; Engl 1 or 1H, 2 or 3 or 3H; Engr 17, 17L, 35, 50; Math 60, 70, 80, 84; Physics 3A, 3B

• **B. S. Degree – Mechanical Engineering**  
  Chem 1A; Engl 1 or 1H, 2 or 3 or 3H; Engr 54, 3A, 17, 17L, 35, 50; Math 60, 70, 80, 85; Physics 3A, 3B, 3C