# Computer Engineering, B.S.

**Program Educational Objectives:** Graduates of the Computer Engineering program will (1) be engaged in professional practice at or beyond the entry level or enrolled in high-quality graduate programs building on a solid foundation in engineering, mathematics, the sciences, humanities and social sciences, and experimental practice as well as modern engineering methods; (2) be innovative in the design, research and implementation of systems and products with strong problem solving, communication, teamwork, leadership, and entrepreneurial skills; (3) proactively function with creativity, integrity and relevance in the ever-changing global environment by applying their fundamental knowledge and experience to solve real-world problems with an understanding of societal, economic, environmental, and ethical issues. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Computer Engineering curriculum includes a core of mathematics, physics, and chemistry. Engineering courses in fundamental areas fill in much of the remaining curriculum.

**High School Students:** See School Admissions (http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#undergraduatestudytext) information.

**Transfer Students:** Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: two years of approved calculus, one year of calculus-based physics with laboratories (mechanics, electricity and magnetism), completion of lower-division writing, and one course in computational methods (e.g., C, C++). For course equivalency specific to each college, visit https://assist.org.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division coursework may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at 949-824-4334.

**All students must meet the University Requirements (http://catalogue.uci.edu/informationforadmittedstudents/requirementsforabachelorsdegree/).**

**All students must meet the School Requirements (http://catalogue.uci.edu/thehenrysamuelischoolofengineering/#schoolrequirementstext).**

**Major Requirements:**

| Mathematics and Basic Science Courses: | |
| --- | --- |
| EECS 55 | Engineering Probability |
| EECS 70LA | Network Analysis I Laboratory |
| EECS 145 | Electrical Engineering Analysis |
| I&C SCI 6D | Discrete Mathematics for Computer Science |
| MATH 2A- 2B | Single-Variable Calculus I and Single-Variable Calculus II |
| MATH 2D | Multivariable Calculus I |
| MATH 3A | Introduction to Linear Algebra |
| MATH 3D | Elementary Differential Equations |
| PHYSICS 7C | Classical Physics |
| PHYSICS 7LC | Classical Physics Laboratory |
| PHYSICS 7D- 7E | Classical Physics and Classical Physics |
| PHYSICS 7LD | Classical Physics Laboratory |
| One additional math or basic science elective from the following: | |
| I&C SCI 6B | Boolean Logic and Discrete Structures |
| MATH 2E | Multivariable Calculus II |
| PHYSICS 51A | Modern Physics |
| PHYSICS 52A | Fundamentals of Experimental Physics |
| or other courses as approved by faculty advisor. | |
| **Engineering Topics Courses:** | |
| Students must complete a minimum of 26 units of engineering design. | |
| Core Courses: | |
| EECS 12 | Introduction to Programming |
| EECS 20 | Computer Systems and C Programming |

| EECS 22 | Advanced C Programming |
|---|---|
| EECS 22L | Software Engineering Project in C Language |
| EECS 31 | Introduction to Digital Systems |
| EECS 31L | Introduction to Digital Logic Laboratory |
| EECS 40 | Object-Oriented Systems and Programming |
| EECS 50 | Discrete-Time Signals and Systems |
| EECS 70A | Network Analysis I |
| EECS 70B | Network Analysis II |
| EECS 70LB | Network Analysis II Laboratory |
| EECS 111 | System Software |
| EECS 112 | Organization of Digital Computers |
| EECS 112L | Organization of Digital Computers Laboratory |
| EECS 113 | Processor Hardware/Software Interfaces |
| EECS 114 | Engineering Data Structures and Algorithms |
| EECS 118 | Introduction to Artificial Intelligence |
| EECS 119 | VLSI |
| EECS 148 | Computer Networks |
| EECS 159A- 159B | Senior Design Project I<br>and Senior Design Project II |
| EECS 170A | Electronics I |
| EECS 170LA | Electronics I Laboratory |
| EECS 170B | Electronics II |
| EECS 170LB | Electronics II Laboratory |
| With the approval of a faculty advisor, students select any additional engineering topics courses needed to satisfy school and department requirements. | |
| **Engineering Elective Courses:** | |
| Select, with approval of a faculty advisor, a minimum of three courses of engineering topics. | |
| COMPSCI 142A | Compilers and Interpreters |
| EECS 101 | Introduction to Machine Vision |
| EECS 116 | Introduction to Data Management |
| EECS 117 | Parallel Computer Systems |
| EECS 120 | Fundamentals of Parallel Computing |
| EECS 121 | System Security |
| EECS 141A | Communication Systems I |
| EECS 141B | Communication Systems II |
| EECS 150 | Continuous-Time Signals and Systems |
| EECS 152A | Digital Signal Processing |
| EECS 152B | Digital Signal Processing Design and Laboratory |
| EECS 195 | Special Topics in Electrical and Computer Engineering |
| EECS 199 | Individual Study (up to 3 graded units) |
| ENGR 7A- 7B | Introduction to Engineering I<br>and Introduction to Engineering II (*) |
| * ENGR 7A and ENGR 7B can be counted as 4 units of Engineering Electives. ENGR 7A and ENGR 7B are available only to lower-division students. Both ENGR 7A and ENGR 7B must be taken to be counted as an Engineering Elective. | |
| **Engineering Professional Topics Courses** | |
| ENGR 190W | Communications in the Professional World |

At most an aggregate total of 6 units of EECS 199 may be used to satisfy degree requirements; EECS 199 is open to students with a 3.0 GPA or higher.

(The nominal Computer Engineering program will require 187 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

The sample program of study chart shown is typical for the major in Computer Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their advisor. Computer Engineering majors are encouraged to consult with academic counselors as needed, and students who are academically at risk are mandated to see a counselor as frequently as deemed necessary by the advising staff.

| Freshman | | |
| --- | --- | --- |
| **Fall** | **Winter** | **Spring** |
| MATH 2A | MATH 2B | MATH 2D |
| EECS 12 | I&C SCI 6D | PHYSICS 7D |
| General Education | PHYSICS 7C- 7LC | PHYSICS 7LD |
| General Education | EECS 31 | EECS 31L |
| | | General Education |
| **Sophomore** | | |
| **Fall** | **Winter** | **Spring** |
| MATH 3A | MATH 3D | EECS 22L |
| PHYSICS 7E | EECS 22 | EECS 50 |
| EECS 20 | EECS 55 | EECS 70B |
| Math./Science Elective | EECS 70A | EECS 70LB |
| | EECS 70LA | General Education |
| **Junior** | | |
| **Fall** | **Winter** | **Spring** |
| EECS 112 | EECS 112L | EECS 111 |
| EECS 40 | EECS 114 | EECS 113 |
| EECS 145 | EECS 170B | EECS 148 |
| EECS 170A | EECS 170LB | General Education |
| EECS 170LA | General Education | |
| **Senior** | | |
| **Fall** | **Winter** | **Spring** |
| EECS 159A | EECS 159B | ENGR 190W |
| EECS 118 | General Education | Engineering Elective |
| EECS 119 | General Education | General Education |
| Engineering Elective | Engineering Elective | |

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

- Electrical and Computer Engineering, M.S.
- Electrical and Computer Engineering, Ph.D.
- Electrical Engineering, B.S.