

# Computer Engineering, B.S.

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**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 and Single-Variable Calculus
MATH 2D	Multivariable Calculus
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
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 Knowledge and Software Engineering
EECS 119	VLSI
EECS 148	Computer Networks
EECS 159A- 159B	Senior Design Project I 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 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 199	Individual Study (up to 3 graded units)
ENGR 7A- 7B	Introduction to Engineering I 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
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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**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
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**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
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**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
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**

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
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.