COMPUTER ENGINEERING, BACHELOR OF SCIENCE

College of Engineering

Faculty (https://ece.ucdavis.edu/directory/)

The Electrical & Computer Engineering Undergraduate Programs

The department administers two undergraduate curricula in the College of Engineering: (1) the Electrical Engineering curriculum and (2) the Computer Engineering curriculum.

Integrated Degree Programs (IDP)

The IDP leads to both the Bachelor of Science and the Master of Science degrees. The program provides a student the opportunity to obtain superior breadth and depth of technical material. The IDP program in the Department of Electrical & Computer Engineering is available only to UC Davis undergraduates with strong academic records enrolled in the Electrical Engineering, Computer Engineering or Applied Physics curricula. Applicants in their junior year must apply for the IDP by the stated date on our website. For more information on IDP, see B.S./M.S. Integrated Degree Programs.

Mission

Under its land grant status, the University of California has a mission to provide the state with the trained workforce it needs and to advance knowledge and research in directions that contribute to the general welfare of the state and the nation. The Department of Electrical & Computer Engineering contributes to the mission of the University in three ways. First, its undergraduate and graduate education programs seek to provide students with an understanding of the fundamental principles of electrical and computer engineering, the skills needed to solve the complex technological problems of modern society and the ability to continue to learn and develop throughout their careers. Second, through its research programs, the department contributes to the development and progress of electronics, communications, and computer technology. Finally, the department helps to transfer research results to industry through publication, public service and professional activities.

Objectives

Teaching—To provide undergraduate students with sufficient breadth to allow them to participate in teams, continue their own education after graduation and select a focus area intelligently; to provide undergraduate students with sufficient depth in a narrower discipline to allow them to develop the ability to solve complex engineering problems; to educate the students in the graduate program to be leaders in industry or to do meaningful research in industry, government or academia.

Research—To develop and maintain research programs that produce useful technological advances while simultaneously training the next generation of researchers and leaders; to update and/or shift the foci of these programs frequently in response to the needs of our constituency and the nation; to provide a stimulating environment that encourages our graduate students to develop their abilities as far as possible.

Computer Engineering Undergraduate Program

The Computer Engineering (BS) program is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org) under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs.

Objectives

The Electrical & Computer Engineering program educational objectives have been developed to address the needs of our constituencies. The objectives of the Electrical & Computer Engineering programs are as follow:

- Graduates will create value for their employers, demonstrating knowledge and initiative and making beneficial contributions beyond the workplace. This can also result in patents, awards, publications and presentations.
- Graduates will grow their capabilities through advanced education and professional development.
- Graduates will provide leadership and be proactive in their profession and/or communities.

Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

The major requirements below are in addition to meeting University Degree Requirements (https://catalog.ucdavis.edu/undergraduate-education/university-degree-requirements/) & College Degree Requirements (https://catalog.ucdavis.edu/undergraduate-education/college-degree-requirements/); unless otherwise noted. The minimum number of units required for the Computer Engineering Bachelor of Science is 145.

Code	Title	Units
Lower Division Required Courses		
CMN 001	Introduction to Public Speaking	4
or CMN 001V	Introduction to Public Speaking	
or ENG 003	Introduction to Engineering Design	
or ENG 003Y	Introduction to Engineering Design	
Mathematics		
MAT 021A	Calculus	4
MAT 021B	Calculus	4
MAT 021C	Calculus	4
MAT 021D	Vector Analysis	4
MAT 022A	Linear Algebra	3
MAT 022AL	Linear Algebra Computer Laboratory	1
MAT 022B	Differential Equations	3
Physics		
PHY 009A	Classical Physics	5
PHY 009B	Classical Physics	5
PHY 009C	Classical Physics	5
Computer Science		
ECS 020	Discrete Mathematics For Computer Science	4
ECS 036A	Programming & Problem Solving	4

ECS 036B	Software Development & Object-Oriented Programming in C++	4
ECS 036C	Data Structures, Algorithms, & Programming	4
Electrical & Computer Engineering		
EEC 001	Introduction to Electrical & Computer Engineering [1]	2
EEC 010	Introduction to Digital & Analog Systems [2]	4
EEC 018	Digital Systems I	5
Engineering		
ENG 017	Circuits I	4
or ENG 017V	Circuits I	
Lower Division Composition/Writing; choose one; a grade of C- or better is required:		4
COM 001	Major Works of the Ancient World	
COM 002	Major Works of the Medieval & Early Modern World	
COM 003	Major Works of the Modern World	
COM 004	Major Works of the Contemporary World	
ENL 003	Introduction to Literature	
or ENL 003V	Introduction to Literature	
NAS 005	Introduction to Native American Literature	
UWP 001	Introduction to Academic Literacies (Recommended)	
UWP 001V	Introduction to Academic Literacies: Online (Recommended)	
UWP 001Y	Introduction to Academic Literacies (Recommended)	
Lower Division Required Course Subtotal		77
Upper Division Required Courses		
Electrical & Computer Engineering		
EEC 100	Circuits II	5
EEC 111	Digital Electronic Circuits	4
EEC 161	Applied Probability for Electrical & Computer Engineers	4
EEC 170	Introduction to Computer Architecture	4
EEC 172	Embedded Systems	4
EEC 173A/ECS 152A	Computer Networks	4
EEC 180	Digital Systems II	5
EEC 196	Issues in Engineering Design	1
Computer Science		
ECS 122A	Algorithm Design & Analysis	4
ECS 150	Operating Systems & System Programming	4
Choose one:		3
ENG/PHY 160	Environmental Physics & Society	
ENG 190	Professional Responsibilities of Engineers	
Upper Division Electives		
Senior Design Project Electives		*6*
Both A & B need to be taken to receive credit for the Senior Design Project.		
EEC 119A	Integrated Circuit Design Project	
EEC 119B	Integrated Circuit Design Project	
EEC 134A	RF/Microwave Systems Design	
EEC 134B	RF/Microwave Systems Design	
EEC 136A	Electronic Design Project	
EEC 136B	Electronic Design Project	
EEC 174AY	Applied Machine Learning	
EEC 174BY	Applied Machine Learning Senior Design Projects	
EEC 175A	Internet of Things	
EEC 175B	Internet of Things Senior Design Project	
EEC 181A	Digital Systems Design Project	
EEC 181B	Digital Systems Design Project	
EEC 193A	Senior Design Project	
EEC 193B	Senior Design Project	
EEC 195A	Autonomous Vehicle Design Project	
EEC 195B	Autonomous Vehicle Design Project	
Upper Division Electrical & Computer Engineering (EEC) or Computer Science Engineering (ECS) Electives [2]		*12-16*
Choose four letter-graded upper division EEC or ECS courses: [3]		
Technical Electives		
Choose 8 units:		8
Chemistry		
CHE 002A	General Chemistry	
CHE 002B	General Chemistry	
CHE 002C	General Chemistry	
Any upper division course. [4]		
Engineering		
ENG 035	Statics	
ENG 045	Properties of Materials	
or ENG 045Y	Properties of Materials	
Any upper division engineering course not used in satisfaction of core degree requirements. [5]		
A maximum of 6 units for any combination of engineering courses numbered 190C, 192, 198, and 199 may be used.		
Mathematics		
Any upper division course. [6]		
Physics		
Any upper division course. [7]		
Statistics		
Any upper division course. [8]		
Biological Sciences		
BIS 101	Genes & Gene Expression	
or BIS 101V	Genes & Gene Expression	
BIS 101D	Genes & Gene Expression Discussion	
BIS 102	Structure & Function of Biomolecules	
BIS 103	Bioenergetics & Metabolism	
BIS 104	Cell Biology	
BIS 122	Population Biology & Ecology	
BIS 122P	Population Biology & Ecology/Advanced Laboratory Topics	
Economics		
ECN 100A	Intermediate Micro Theory: Consumer & Producer Theory	
or ECN 100AV	Intermediate Micro Theory: Consumer & Producer Theory	

ECN 100B	Intermediate Micro Theory: Imperfect Competition & Market Failure	
ECN 101	Intermediate Macro Theory	
ECN 102	Analysis of Economic Data	
ECN 103	Economics of Uncertainty & Information	
ECN 122	Theory of Games & Strategic Behavior	
ECN 140	Econometrics	
Management		
MGT 011A	Elementary Accounting	
MGT 011B	Elementary Accounting	
MGT 100	(Discontinued)	
MGT 120	Managing & Using Information Technology	
MGT 140	Marketing for the Technology-Based Enterprise	
MGT 150	Technology Management	
MGT 160	Financing New Business Ventures	
MGT 170	Management Accounting & Control	
MGT 180	Supply Chain Planning & Management	
Upper Division Composition Requirement		
Choose one; a grade of a C- or better is required:		0-4
UWP 101	Advanced Composition	
or UWP 101V	Advanced Composition	
or UWP 101Y	Advanced Composition	
UWP 102A	Writing in the Disciplines: Special Topics	
UWP 102B	Writing in the Disciplines: Biology	
UWP 102C	Writing in the Disciplines: History	
UWP 102D	Writing in the Disciplines: International Relations	
UWP 102E	Writing in the Disciplines: Engineering	
UWP 102F	Writing in the Disciplines: Food Science & Technology	
UWP 102G	Writing in the Disciplines: Environmental Writing	
UWP 102H	Writing in the Disciplines: Human Development & Psychology	
UWP 102I	Writing in the Disciplines: Ethnic Studies	
UWP 102J	Writing in the Disciplines: Fine Arts	
UWP 102K	Writing in the Disciplines: Sociology	
UWP 102L	Writing in the Disciplines: Film Studies	
UWP 104A	Writing in the Professions: Business Writing	
or UWP 104AV	Writing in the Professions: Business Writing	
or UWP 104AY	Writing in the Professions: Business Writing	
UWP 104B	Writing in the Professions: Law	
UWP 104C	Writing in the Professions: Journalism	
UWP 104D	Writing in the Professions: Elementary & Secondary Education	
UWP 104E	Writing in the Professions: Science	
UWP 104F	Writing in the Professions: Health	
or UWP 104FV	Writing in the Professions: Health	
or UWP 104FY	Writing in the Professions: Health	
UWP 104I	Writing in the Professions: Internships	
UWP 104J	Writing in the Professions: Writing for Social Justice	
UWP 104T	Writing in the Professions: Technical Writing	
Passing the Upper Division Composition Exam.		
Upper Division Required Course Subtotal		68-76
Total Units		**145-153**

1

Transfer and change of major students will need 2 additional units of upper division electives instead of EEC 001.

2

Transfer and change of major students who do not take EEC 010 will substitute 4 additional units of upper division electives.

3

Excluding ECS 111, ECS 113, ECS 115, ECS 116, ECS 117, ECS 132, ECS 154A, ECS 154B, ECS 171, ECS 188.

4

Except CHE 195, CHE 197.

5

Excluding ENG 100, ENG 160, ENG 190 (each restricted to 1 unit of technical elective), ENG 198, ECS 111, ECS 113, ECS 115, ECS 116, ECS 117, ECS 132, ECS 154A, ECS 154B, ECS 171, ECS 188.

6

Except MAT 135A, MAT 197TC.

7

Except PHY 116A, PHY 116B, PHY 116C, PHY 160 (restricted to 1 unit of technical elective), PHY 195, PHY 197T.

8

Except STA 100, STA 101, STA 103, STA 104, STA 106, STA 108, STA 130A.