COMPUTER SCIENCE & ENGINEERING, BACHELOR OF SCIENCE

College of Engineering

The Computer Science Engineering major prepares students to do further work in hardware, software, theory, or electronics, either in industry or in postgraduate study.

The primary differences between the Computer Science Engineering and the Computer Science majors are the extent of course work covering hardware and the flexibility of the curriculum. The Computer Science Engineering major develops a solid understanding of the entire machine, including hands-on experience with its hardware components. The Computer Science major has some course work on hardware, at the digital-design level, on simulators. The Computer Science Engineering major has fewer free electives. The CS major's more generous electives make it easier to complete a minor or double major.

A key theme of the Computer Science Engineering curriculum is the hardware/software interaction, a theme reflected in the courses required and the orientation of the courses themselves.

The Computer Science & Engineering major provides students with a solid background in mathematics, physics, chemistry, and electronic circuits and systems, all supporting the computer hardware and computer software courses that constitute the focus of the curriculum.

Computer Science & Engineering Undergraduate Program

The Computer Science & Engineering program is accredited by the Engineering Accreditation Commission and the Computing Accreditation Commission of ABET (http://www.abet.org).

Exclusive of General Education units, the minimum number of units for the Computer Science & Engineering major is 144.

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.

Major Advisors

A. Abrahamson, K. Gage, J. Sison

For information on how to speak to an advisor, see CS Undergraduate Advising (https://cs.ucdavis.edu/advising/).

Before declaring a major in Computer Science & Engineering, students must complete specific course requirements and meet GPA minimums. For a full list of requirements to declare the major, see CS Advising (https://cs.ucdavis.edu/undergraduate/changing-majors-double-majors/).

Code	Title	Units
Lower Division Required Courses		
Mathematics		
MAT 021A	Calculus	4
MAT 021B	Calculus	4
MAT 021C	Calculus	4
MAT 021D	Vector Analysis	4
Choose one:		3-4
MAT 022A	Linear Algebra	
MAT/BIS 027A	Linear Algebra with Applications to Biology	
MAT 067	Modern Linear Algebra	
Choose one:		3-4
MAT 022B	Differential Equations	
MAT/BIS 027B	Differential Equations with Applications to Biology	
Physics		
PHY 009A	Classical Physics	5
PHY 009B	Classical Physics	5
PHY 009C	Classical Physics	5
PHY 009D	Modern Physics	4
Chemistry		
CHE 002A	General Chemistry	5
Computer Science Engineering		
ECS 020	Discrete Mathematics For Computer Science	4
ECS 050	Computer Organization & Machine-Dependent Programming	4
Choose a series option (must complete one full series in entirety; mixing of courses between series is not allowed):		12-16
(a)		
ECS 036A	Programming & Problem Solving	
ECS 036B	Software Development & Object-Oriented Programming in C++	
ECS 036C	Data Structures, Algorithms, & Programming	
(b)		
ECS 032A	Introduction to Programming	
or ECS 036A	Programming & Problem Solving	
ECS 032B	Introduction to Data Structures	
ECS 032C	Implementation of Data Structures in C	
ECS 034	Software Development in UNIX & C++	
Engineering		
ENG 017	Circuits I	4
or ENG 017V	Circuits I	
Communications		
CMN 001	Introduction to Public Speaking	4
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 Courses Subtotal		78-84

Upper Division Required Courses

Computer Science Engineering

ECS 132	Probability & Statistical Modeling for Computer Science	4
ECS 140A	Programming Languages	4
ECS 150	Operating Systems & System Programming	4
ECS 152A/EEC 173A	Computer Networks	4
ECS 154A	Computer Architecture	4
ECS 154B	Computer Architecture	4
ECS 160	Software Engineering	4
ECS 188	Ethics in an Age of Technology	4
ECS 193A	Capstone Project	3
ECS 193B	Capstone Project	3
ECS 120	Theory of Computation	4
or ECS 122A	Algorithm Design & Analysis	

Electrical & Computer Engineering

EEC 100	Circuits II	5
EEC 172	Embedded Systems	4

Computer Science Electives

Choose a minimum of four courses and a minimum of 15 units [1]		15

Upper Division Composition Requirement

Choose one:		0-4
UWP 101	Advanced Composition (Grade of C- or better required.)	
or UWP 101V	Advanced Composition	
or UWP 101Y	Advanced Composition	
Passing the Upper Division Composition Exam administered by the College of Letters & Science.		
Upper Division Required Courses Subtotal		66-70
Total Units		**144-154**

[1] Chosen from ECS courses numbered 120 to 189 inclusive; one approved course of 3-5 units from ECS 192 or ECS 199; EEC 171, EEC 180A Discontinued, EEC 180B Discontinued; one course may be taken from the following restricted elective list: ECN 122; LIN 127, LIN 177; MAT 135A, MAT 135B; PSC 120; STA 131A, STA 131B. No course can count as both a required course and a computer science and engineering elective.