COMPUTER SCIENCE, BACHELOR OF SCIENCE

College of Engineering

The Major Program

The Department of Computer Science administers two majors: Computer Science & Engineering (CSE) and Computer Science (CS). It also administers two minors: Computer Science (https://catalog.ucdavis.edu/departments-programs-degrees/computer-science-engineering/computer-science-minor/) and Computational Biology (https://catalog.ucdavis.edu/departments-programs-degrees/computer-science-engineering/computational-biology-minor/). For information on the Computer Science & Engineering curriculum and the minor in Computational Biology, see Computer Science Engineering (https://www.ucdavis.edu/majors/computer-science-and-engineering/).

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

Students in the CS major receive a solid grounding in the fundamentals of computer languages, operating systems, computer architecture, and the mathematical abstractions underpinning computer science. Students are prepared for both industry and postgraduate study.

Major Advisors

J. Clifford, K. Gage, P. Kumari

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

Graduate Study

See Graduate Studies (http://gradstudies.ucdavis.edu/).

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

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 Science Bachelor of Science is 104.

Code	Title	Units
Preparatory Subject Matter		
Mathematics		
MAT 021A	Calculus	4
MAT 021B	Calculus	4
MAT 021C	Calculus	4
Choose one:		3-4
MAT 022A	Linear Algebra	
MAT/BIS 027A	Linear Algebra with Applications to Biology	
MAT 067	Modern Linear Algebra	
Computer Science Engineering		*20*
ECS 020	Discrete Mathematics For Computer Science	
ECS 036A	Programming & Problem Solving	
ECS 036B	Software Development & Object-Oriented Programming in C++	
ECS 036C	Data Structures, Algorithms, & Programming	
ECS 050	Computer Organization & Machine-Dependent Programming	
Choose three:		15
BIS 002A	Introduction to Biology: Essentials of Life on Earth	
BIS 002B	Introduction to Biology: Principles of Ecology & Evolution	
BIS 002C	Introduction to Biology: Biodiversity & the Tree of Life	
CHE 002A	General Chemistry	
CHE 002B	General Chemistry	
CHE 002C	General Chemistry	
CHE 004A	General Chemistry for the Physical Sciences & Engineering	
CHE 004B	General Chemistry for the Physical Sciences & Engineering	
CHE 004C	General Chemistry for the Physical Sciences & Engineering	
PHY 009A	Classical Physics	
PHY 009B	Classical Physics	
PHY 009C	Classical Physics	
Preparatory Subject Matter Subtotal		**50-51**
Depth Subject Matter		
Computer Science Engineering		
ECS 122A	Algorithm Design & Analysis	4
ECS 120	Theory of Computation	4
or ECS 122B	Algorithm Design & Analysis	
ECS 140A	Programming Languages	4
ECS 150	Operating Systems & System Programming	4
ECS 154A	Computer Architecture	4
Choose one:		4
ECS 132	Probability & Statistical Modeling for Computer Science	
MAT 135A	Probability	
STA 131A	Introduction to Probability Theory	
Computer Science Electives		
Choose a minimum of seven courses, including at least one Mathematics (MAT) or Statistics (STA) course. A minimum of four electives must be (ECS) courses: [1]		26-31
No course can count as both a required course and a Computer Science elective.		
Upper Division Composition Requirement		
Choose one of the following:		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 102M	Writing in the Disciplines: Community & Regional Development	
UWP 102N	Writing in the Disciplines: Anthropology	
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.		
Depth Subject Matter Subtotal		54-59
Total Units		**104-110**

[1]

Chosen from ECS courses numbered 120 to 189 inclusive; ECS 193A-ECS 193B (counts as one); one approved 3–5 unit course from ECS 192 or ECS 199; ECN 122; EEC 100, EEC 171, EEC 172; LIN 127, LIN 177; STA 131A, STA 131B, STA 141B, STA 141C, STS 115; PSC 120; MAT courses numbered 100 to 189, excluding MAT 111.