

Bachelor of Science in Computer Science

The Bachelor of Science in Computer Science (BSCS) is designed for students planning a career in computing. Students working toward a BSCS degree must meet all requirements for an applied science degree from the McKelvey School of Engineering. In addition, there are the following departmental course requirements:

- **Computer Science Core Requirements (21 units total):**

Code	Title	Units
CSE 131	Introduction to Computer Science	3
CSE 132	Introduction to Computer Engineering	3
CSE 240	Logic and Discrete Mathematics	3
or Math 310	Foundations for Higher Mathematics	
CSE 247	Data Structures and Algorithms	3
CSE 332S	Object-Oriented Software Development Laboratory	3
CSE 347	Analysis of Algorithms	3
CSE 361S	Introduction to Systems Software	3
Total Units		21

¹ Each of these core courses must be passed with a grade of C- or better.

- **Systems Requirement (3 units). Choose one of the following:**

Code	Title	Units
CSE 422S	Operating Systems Organization	3
CSE 425S	Programming Systems and Languages	3
CSE 431S	Translation of Computer Languages	3
CSE 433S	Introduction to Computer Security	3
CSE 434S	Reverse Engineering and Malware Analysis	3
CSE 473S	Introduction to Computer Networks	3

¹ The selected course must be passed with a grade of C- or better.

- **Methods Requirement (3 units). Choose one of the following:**

Code	Title	Units
CSE 256A	Introduction to Human-Centered Design	3
CSE 411A	AI and Society	3
CSE 412A	Introduction to Artificial Intelligence	3
CSE 416A	Data Science for Complex Networks	3
CSE 417T	Introduction to Machine Learning	3

or ESE 417	Introduction to Machine Learning and Pattern Classification	
CSE 442T	Introduction to Cryptography	3
CSE 457A	Introduction to Visualization	3
CSE 468T	Introduction to Quantum Computing	3

¹ The selected course must be passed with a grade of C- or better.

- **Computer Science Technical Elective Requirements:**

Students must complete 15 additional units (five courses) of CSE Technical Electives, which can come from any CSE classroom course including Systems and Methods Courses.

- **Overall Degree Restrictions:**

Up to 6 units total can come from a combination of approved CSE Independent Study (CSE 400E, CSE 497, CSE 498, CSE 499) or approved courses from other departments (e.g., ESE 417). Courses taken in other departments must have significant technical computing content, including those outside of the McKelvey School of Engineering. Students must complete the Elective Request form to request review of non-CSE courses. Students with interests in a particular area of computing should refer to the technical elective course sequences for suggestions on which courses are relevant to that area.

At least two courses must be CSE classroom courses at the 400 level or higher.

All courses must be taken for a grade. Core, Systems, and Methods requirements require a C- or better. All other courses require a passing grade.

- **Math Requirements:**

Code	Title	Units
Math 131	Calculus I	3
Math 132	Calculus II	3
Math 233	Calculus III	3
Math 309	Matrix Algebra	3
or ESE 2180	Linear Algebra and Component Analysis	
ESE 326	Probability and Statistics for Engineering	3
or SDS 3200	Elementary to Intermediate Statistics and Data Analysis	
or SDS 3211	Statistics for Data Science I	
or DAT 120 & DAT 121	Managerial Statistics I and Managerial Statistics II	
Total Units		15

Upon completing a course in the calculus sequence (Math 131-Math 132-Math 233) with a grade of C+ or better, the student may apply to receive credit for the preceding courses in the calculus sequence by following the Department of Mathematics' back credit policy.

- **Additional Departmental Requirements:**

Code	Title	Units
CWP 100	College Writing	3
Engr 310	Technical Writing	3
Natural sciences electives		8
Humanities and social sciences electives		18
Total Units		32

The College Writing Program, humanities, and social sciences requirements are required of all students in the McKelvey School of Engineering. For information about how to fulfill the school's English proficiency requirement, please visit the Degree Requirements page of this Bulletin.

The natural sciences requirement is for 8 units designated NSM (Natural Sciences and Mathematics) from any of the following departments: Anthropology; Biology; Chemistry; Earth, Environmental, and Planetary Sciences; Environmental Studies; or Physics. The College Writing Program and natural sciences courses must be completed with a grade of C- or better.

All courses taken to meet any of the above requirements (with the exception of the humanities and social sciences electives) cannot be taken on a pass/fail basis.