COMPUTER SCIENCE, BACHELOR OF SCIENCE

The Major Program

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
A. Abrahamson, K. Gage, J. Sison; For information on how to speak to an advisor, see CS Undergraduate Advising (https://cs.ucdavis.edu/undergraduate/changing-majors-double-majors/)

Graduate Study
See Graduate Study (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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparatory Subject Matter</strong></td>
<td></td>
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<tr>
<td><strong>Mathematics</strong></td>
<td></td>
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<tr>
<td>MAT 021A</td>
<td>Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MAT 021B</td>
<td>Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MAT 021C</td>
<td>Calculus</td>
<td>4</td>
</tr>
<tr>
<td>Choose one:</td>
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<tr>
<td>MAT 022A</td>
<td>Linear Algebra</td>
<td>3-4</td>
</tr>
<tr>
<td>MAT/BIS 027A</td>
<td>Linear Algebra with Applications to Biology</td>
<td></td>
</tr>
<tr>
<td>MAT 067</td>
<td>Modern Linear Algebra</td>
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<tr>
<td><strong>Computer Science Engineering</strong></td>
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<tr>
<td>ECS 020</td>
<td>Discrete Mathematics For Computer Science</td>
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<tr>
<td>ECS 036A</td>
<td>Programming &amp; Problem Solving</td>
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<tr>
<td><strong>Depth Subject Matter</strong></td>
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<tr>
<td>ECS 036B</td>
<td>Software Development &amp; Object-Oriented Programming in C++</td>
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<tr>
<td>ECS 036C</td>
<td>Data Structures, Algorithms, &amp; Programming</td>
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<tr>
<td>ECS 050</td>
<td>Computer Organization &amp; Machine-Dependent Programming</td>
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</tbody>
</table>

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     |
ECS 122B   | Algorithm Design & Analysis                   |       |
ECS 140A   | Programming Languages                         | 4     |
ECS 150    | Operating Systems & System Programming        | 4     |
ECS 154A   | Computer Architecture                         | 4     |
Choose one:                                                                                       |
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

No course can count as both a required course and a Computer Science elective.

Depth Subject Matter Subtotal 50-55

**Total Units** 100-106

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1 ECS 120-ECS 189 inclusive; ECS 193AB Discontinued (counts as one); one approved 3–5 unit course from ECS 192 or ECS 199; ECN 122; EEC 100, EEC 171, EEC 172, EEC 180A Discontinued, EEC 180B Discontinued; LIN 127, 177; MAT 100 Discontinued-MAT 199, excluding MAT 111; STA 131A, STA 131B, STA 141B, STA 141C STS 115; PSC 120.