Computer Science is the scientific study of computing devices, the
software that drives them, and the computational tasks they are
capable of performing. Computer scientists study both hardware
and software; as with all sciences, each of these possesses both
theoretical and applied components. Computing theory shares
knowledge and techniques with the fields of mathematics, physics,
engineering, philosophy, psychology, and linguistics. Its applications
span the range of human endeavors: the physical life and social
sciences; the literary, visual, and performing arts; law; government;
recreation; and virtually every sector of the commercial world. Thus,
computer science is by its very nature an interdisciplinary subject
that offers both a solid unifying foundation for a liberal arts and sci-
ences education, and valuable career skills.

The curriculum consists of a rigorous course of study in computer
science and mathematics and provides the student with a thorough
grounding in programming, fundamentals of computer organiza-
tion, data structures, and algorithm design. It is designed to prepare
students for careers in the computer industry and graduate work in
computer science.

All courses submitted toward either major or minor requirements
in the Computer Science Department must be taken for a letter
grade (A-F). This includes electives in CS and all other courses
taken to satisfy the major. This does not apply to courses that are
challenged. Only those classes for which the student has received
a C- or better may be used to satisfy prerequisite requirements. An
instructor may require the student to provide evidence of having
met prerequisite requirements.

**Degree Requirements for a Bachelor of Science in Computer Science**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>42 - 45 units</td>
</tr>
<tr>
<td>(51 units, 6-9 covered by major requirements)</td>
<td></td>
</tr>
<tr>
<td>Computer Science Core</td>
<td>49 units</td>
</tr>
<tr>
<td>Computer Science Electives</td>
<td>9 units</td>
</tr>
<tr>
<td>Computer Science Capstone Requirement</td>
<td>3 units</td>
</tr>
<tr>
<td>Required Supporting Courses</td>
<td>10 - 12 units</td>
</tr>
<tr>
<td>General Electives</td>
<td>6-8 units</td>
</tr>
<tr>
<td><strong>Total units needed for graduation</strong></td>
<td><strong>124</strong></td>
</tr>
</tbody>
</table>

**Major Core Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 115</td>
<td>Programming I (GE Area B3)</td>
<td>4</td>
</tr>
<tr>
<td>CS 210</td>
<td>Introduction to Unix</td>
<td>1</td>
</tr>
<tr>
<td>CS 215</td>
<td>Programming II</td>
<td>4</td>
</tr>
<tr>
<td>CS 242</td>
<td>Discrete Structures for Computer Science</td>
<td>4</td>
</tr>
<tr>
<td>CS 252</td>
<td>Introduction to Computer Organization</td>
<td>4</td>
</tr>
<tr>
<td>CS 315</td>
<td>Data Structures</td>
<td>4</td>
</tr>
<tr>
<td>CS 351</td>
<td>Computer Architecture</td>
<td>4</td>
</tr>
<tr>
<td>CS 355</td>
<td>Database Management Systems Design</td>
<td>4</td>
</tr>
<tr>
<td>CS 370</td>
<td>Software Design and Development</td>
<td>4</td>
</tr>
<tr>
<td>CS 415</td>
<td>Algorithm Analysis</td>
<td>4</td>
</tr>
<tr>
<td>CS 450</td>
<td>Operating Systems</td>
<td>4</td>
</tr>
<tr>
<td>CS 454</td>
<td>Theory of Computation</td>
<td>4</td>
</tr>
<tr>
<td>CS 460</td>
<td>Programming Languages</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total units in major core** | 49

**Computer Science Electives**

Choose 9 units of upper-division CS electives (see list below). No
more than 3 units can be satisfied by a combination of CS 349, 390,
495, and 497.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 340</td>
<td>Computer Security and Malware</td>
<td>3</td>
</tr>
<tr>
<td>CS 349</td>
<td>Problem Solving in a Team Environment</td>
<td>1</td>
</tr>
<tr>
<td>CS 360</td>
<td>Object-Oriented Programming</td>
<td>3</td>
</tr>
<tr>
<td>CS 365</td>
<td>Computer Networking and the Internet</td>
<td>3</td>
</tr>
<tr>
<td>CS 375</td>
<td>Computer Graphics</td>
<td>3</td>
</tr>
<tr>
<td>CS 385</td>
<td>Selected Topics</td>
<td>1-4*</td>
</tr>
<tr>
<td>CS 390</td>
<td>Computer Science Colloquium</td>
<td>1</td>
</tr>
<tr>
<td>CS 452</td>
<td>Compiler Design and Construction</td>
<td>3</td>
</tr>
<tr>
<td>CS 465</td>
<td>Data Communications</td>
<td>3</td>
</tr>
<tr>
<td>CS 480</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CS 495</td>
<td>Special Studies</td>
<td>1-4</td>
</tr>
<tr>
<td>CS 496</td>
<td>Senior Seminar</td>
<td>1-4</td>
</tr>
<tr>
<td>CS 497</td>
<td>Internship</td>
<td>2</td>
</tr>
</tbody>
</table>

*Selected topics courses include Bioinformatics, Data Compression, Computer Game Development, Parallel and Distributed Computing, Wireless Networks, Mobile Application Development, and other current topics in computer science.

**Total units in major electives** | 9
**CS Capstone Requirement**

One of the following courses:
- CS 470 Advanced Software Design Project  3
- CS 495 Special Studies (requires instructor approval)  3

Total units in capstone requirement  3

**Required Supporting Courses**

MATH 161 Differential and Integral Calculus I (GE Area B4)  4

Two additional courses from the following:  6-8
- MATH 165 Elementary Statistics  4
- MATH 211 Differential and Integral Calculus II  4
- MATH 222 Elementary Applied Linear Algebra  3
- MATH 241 Differential Equations with Linear Algebra  4
- MATH 306 Number Theory  3
- MATH 316 Graph Theory and Combinatorics  3
- MATH 352 Numerical Analysis  3
- MATH 416 Graph Theory and Combinatorics  3
- MATH 430 Linear Systems Theory  3
- MATH 470 Mathematical Models  3
- PHYS 214 Introduction to Physics II  4
  (Prerequisite PHYS 114, GE Area B1)

Or other by arrangement with the CS Department

Total units in other required courses  10-12

Total units in the major  71-73

**Minor in Computer Science**

Students electing this minor will be prepared for careers in business application programming, scientific application programming, computer equipment sales, as field engineers, and as data processing managers among the myriad job opportunities associated with the computer field. Approval of the minor curriculum should be obtained by the junior year at the latest in order that the minor may be properly planned.

**Minor Core Requirements**

CS 115 Programming I  4
CS 210 Introduction to UNIX  1
CS 215 Programming II  4

Total units in minor core  9

**Minor Electives**

Choose 11 units of CS major courses (listed under Major Core Requirements and Computer Science Electives) of which 6 units must be upper-division. No more than 2 units in any combination of CS 349, 390, 495, and 497 can be applied toward the minor.

Total units in minor electives  11

Total units in the minor  20

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**Sample Four-Year Plan for Bachelor of Science in Computer Science**

**FRESHMAN YEAR:: 28 Units**

**Fall Semester (13 Units)**
- CS 115 (GE-B3)  (4)
- MATH 161 (GE-B4)  (4)
- CS 210 (1)
- GE (3), GE (3), GE (3)

**Spring Semester (15 Units)**
- CS 215 (4)
- MATH 161 (GE-B4) (4)
- GE (3), GE (3)

**SOPHOMORE YEAR:: 30-31 Units**

**Fall Semester (16/17 Units)**
- CS 242 (4)
- Supporting Course in MATH/PHYS (3/4)
- CS 315 (4)
- GE (3), GE (3), GE (3)

**Spring Semester (14 Units)**
- CS 252 (4)
- GE (3), GE (3)
- General Elective (3)

**JUNIOR YEAR:: 33-34 Units**

**Fall Semester (16/17 Units)**
- CS 351 (4)
- CS 355 (4)
- Supporting Course in MATH/PHYS (3/4)
- CS 370 (4)
- CS Elective (3)
- GE (3), GE (3)

**Spring Semester (17 Units)**
- CS 370 (4)
- CS Elective (3)
- Upper-division GE (3)
- General Electives (3-5*)

**SENIOR YEAR:: 30 Units**

**Fall Semester (15 Units)**
- CS 450 (4)
- CS 454 (4)
- CS 460 (4)
- Upper-division GE (3)

**Spring Semester (15 Units)**
- CS 415 (4)
- CS 470 (3)
- CS Elective (3)
- Upper-division GE (3)
- General Electives (3-5*)

*to total 124 units

**TOTAL UNITS:: 124**