# MAJOR IN COMPUTER SCIENCE, SOFTWARE ENGINEERING CONCENTRATION

## Requirements

**Effective Fall 2021**

A minimum grade of C (2.000) is required in CO 150 and in all CS, CIS, DSCI, MATH, and STAT courses which are required for graduation.

## Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>AUCC</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO 150</td>
<td>College Composition (GT-CO2)</td>
<td>1A</td>
<td>3</td>
</tr>
<tr>
<td>CS 165</td>
<td>CS2--Data Structures</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>MATH 160</td>
<td>Calculus for Physical Scientists I (GT-MA1)</td>
<td>1B</td>
<td>4</td>
</tr>
</tbody>
</table>

Select one course from the following:

- CS 163 — CS1—No Prior Programming Experience
- CS 164 — CS1—Prior Programming Experience

Select at least two courses totaling a minimum of 7 credits from the following (one course must be or include the sequenced laboratory):

- AA 100 & AA 101 — Introduction to Astronomy (GT-SC2) 3A
- ANTH 120 & ANTH 121 — Human Origins and Variation (GT-SC2) 3A
- BZ 110 & BZ 111 — Principles of Animal Biology (GT-SC2) 3A
- BZ 120 — Principles of Plant Biology (GT-SC1) 3A
- CHEM 107 & CHEM 108 — Fundamentals of Chemistry (GT-SC2) 3A
- CHEM 111 & CHEM 112 — General Chemistry I (GT-SC2) 3A
- GEOL 120 & GEOL 121 — Exploring Earth - Physical Geology (GT-SC2) 3A
- GEOL 122 & GEOL 121 — The Blue Planet - Geology of Our Environment (GT-SC2) 3A
- GEOL 124 & GEOL 121 — Geology of Natural Resources (GT-SC2) 3A
- GEOL 150 — Physical Geology for Scientists and Engineers 3A
- HONR 292A — Honors Seminar: Knowing in the Sciences 3A
- LIFE 102 — Attributes of Living Systems (GT-SC1) 3A
- LIFE 103 — Biology of Organisms-Animals and Plants (GT-SC1) 3A
- LIFE 201A — Introductory Genetics: Applied/Population/Conservation/Ecological (GT-SC2) 3A
- LIFE 201B — Introductory Genetics: Molecular/Immunological/Developmental (GT-SC2) 3A
- LIFE 220/LAND 220 — Fundamentals of Ecology (GT-SC2) 3A
- NR 150 — Oceanography (GT-SC2) 3A
- PH 121 — General Physics I (GT-SC1) 3A
- PH 122 — General Physics II (GT-SC1) 3A
- PH 141 — Physics for Scientists and Engineers I (GT-SC1) 3A
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title and Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 142</td>
<td>Physics for Scientists and Engineers II (GT-SC1)</td>
<td>3A</td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>(<a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities</a>)</td>
<td>3B</td>
</tr>
<tr>
<td>Diversity and Global Awareness</td>
<td>(<a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-global-awareness">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-global-awareness</a>)</td>
<td>3E</td>
</tr>
<tr>
<td>Elective</td>
<td></td>
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<tr>
<td><strong>Total Credits</strong></td>
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<td></td>
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**Sophomore**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title and Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 320</td>
<td>Project Management for Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>CS 201/PHIL 201</td>
<td>Ethical Computing Systems (GT-AH3)</td>
<td>3B</td>
</tr>
<tr>
<td>CS 220</td>
<td>Discrete Structures and their Applications</td>
<td>4</td>
</tr>
<tr>
<td>CS 253</td>
<td>Software Development with C++</td>
<td>4</td>
</tr>
<tr>
<td>CS 270</td>
<td>Computer Organization</td>
<td>4</td>
</tr>
<tr>
<td>Select one course from the following:</td>
<td></td>
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</tr>
<tr>
<td>DSCI 369</td>
<td>Linear Algebra for Data Science</td>
<td></td>
</tr>
<tr>
<td>MATH 369</td>
<td>Linear Algebra I</td>
<td></td>
</tr>
<tr>
<td>Select one course from the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT 301</td>
<td>Introduction to Applied Statistical Methods</td>
<td></td>
</tr>
<tr>
<td>STAT 302A</td>
<td>Statistics Supplement: General Applications</td>
<td></td>
</tr>
<tr>
<td>STAT 307</td>
<td>Introduction to Biostatistics</td>
<td></td>
</tr>
<tr>
<td>STAT 315</td>
<td>Intro to Theory and Practice of Statistics</td>
<td></td>
</tr>
<tr>
<td>Historical Perspectives</td>
<td>(<a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives</a>)</td>
<td>3D</td>
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<tr>
<td>Elective</td>
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<tr>
<td><strong>Total Credits</strong></td>
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**Junior**

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<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>CIS 360</td>
<td>Systems Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>CS 314</td>
<td>Software Engineering</td>
<td>4A,4B</td>
</tr>
<tr>
<td>CS 320</td>
<td>Algorithms Theory and Practice</td>
<td>3</td>
</tr>
<tr>
<td>CS 356</td>
<td>Systems Security</td>
<td>3</td>
</tr>
<tr>
<td>CS 370</td>
<td>Operating Systems</td>
<td>3</td>
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<tr>
<td>Select one course from the following:</td>
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<tr>
<td>CS 312</td>
<td>Modern Web Applications</td>
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<tr>
<td>CS 345</td>
<td>Machine Learning Foundations and Practice</td>
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</tr>
<tr>
<td>CS course numbered 400- or above, excluding 480-499</td>
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<tr>
<td>Advanced Writing</td>
<td>(<a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing</a>)</td>
<td>2</td>
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<tr>
<td>Social and Behavioral Sciences</td>
<td>(<a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences</a>)</td>
<td>3C</td>
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<tr>
<td>Electives</td>
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<td><strong>Total Credits</strong></td>
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**Senior**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title and Description</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CS 414</td>
<td>Object-Oriented Design</td>
<td>4C</td>
</tr>
<tr>
<td>CS 415</td>
<td>Software Testing</td>
<td>4</td>
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<tr>
<td>Depth course - select two courses from the following:</td>
<td></td>
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<tr>
<td>CS 430</td>
<td>Database Systems</td>
<td></td>
</tr>
<tr>
<td>CS 435</td>
<td>Introduction to Big Data</td>
<td></td>
</tr>
<tr>
<td>CS 440</td>
<td>Introduction to Artificial Intelligence</td>
<td></td>
</tr>
<tr>
<td>CS 453</td>
<td>Introduction to Compiler Construction</td>
<td></td>
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<tr>
<td>CS 455</td>
<td>Introduction to Distributed Systems</td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>Credits</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>CS 462</td>
<td>Engaging in Virtual Worlds</td>
<td></td>
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<tr>
<td>CS 464</td>
<td>Principles of Human-Computer Interaction</td>
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</tr>
<tr>
<td>Electives(^1)</td>
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<tr>
<td><strong>Total Credits</strong></td>
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<td><strong>30</strong></td>
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<tr>
<td><strong>Program Total Credits:</strong></td>
<td></td>
<td><strong>120</strong></td>
</tr>
</tbody>
</table>

\(^1\) Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).