COMPUTER SCIENCE (B.S.C.S.)

B.S.C.S. Program Educational Objectives

1. Practice in a computer science related profession and/or pursue advanced studies in computer science or related discipline.
2. Use effective oral and written communication skills.
3. Participate in collaborative environments.
4. Become leaders in their chosen field.
5. Exhibit a sense of professional ethics and civic responsibility.

B.S.C.S. Student Outcomes

Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program.

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program’s discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

B.S.C.S. Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 1310</td>
<td>Writing and Academic Inquiry Seminars</td>
<td>3</td>
</tr>
<tr>
<td>PWR 3300</td>
<td>Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>Select one from each group:</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>GTX 2301</td>
<td>Intellectual Traditions of the Ancient World: Literature and Thought</td>
<td></td>
</tr>
<tr>
<td>GTX 2302</td>
<td>Medieval Intellectual Traditions: Literature and Thought in Context</td>
<td></td>
</tr>
<tr>
<td>GTX 3343</td>
<td>Great Texts in the Origins of Science</td>
<td></td>
</tr>
<tr>
<td>GTX 4341</td>
<td>Great Texts in Modern Science</td>
<td></td>
</tr>
</tbody>
</table>

Foreign Language

Second level proficiency (at least 1302 or 1412) must be achieved.

- Complete one course to reach second level proficiency (1302, 1412, 2310, or 2320).
- Complete two courses to reach second level proficiency (beginning with 1301 or 1401).

CSS 1302 | Speech for Business and Professional Students | 3 |

Mathematics

- MTH 1321 | Calculus I | 3 |
- MTH 1322 | Calculus II | 3 |
- STA 3381 | Probability and Statistics | 3 |

Other Requirements

- Lifetime Fitness, two courses | 2 |
- Chapel - two semesters | 0 |

Options

Select one of the following three options: 81-85

- Option A - Computer Science Major (Computer Science Concentration)
- Option B - Computer Science Major (Software Engineering Concentration)
- Option C - Computer Science Major (Cybersecurity Concentration)

Minor

Optional, may elect one or more minors. See specific requirements in departmental sections of this catalog.

No more than three hours from the major may be applied to the minor.

Advanced Work

Advanced work (“3000” or “4000” numbered courses) minimum (36)

Total Hours 119-126

Option A - Computer Science Major (Computer Science Concentration)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>CSI 1430</td>
<td>Introduction to Computer Science I with Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CSI 1440</td>
<td>Introduction to Computer Science II with Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CSI 2334</td>
<td>Introduction to Computer Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSI 2350</td>
<td>Discrete Structures</td>
<td>3</td>
</tr>
<tr>
<td>CSI 3334</td>
<td>Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>CSI 3335</td>
<td>Database Design and Applications</td>
<td>3</td>
</tr>
<tr>
<td>CSI 3336</td>
<td>Systems Programming</td>
<td>3</td>
</tr>
<tr>
<td>CSI 3344</td>
<td>Introduction to Algorithms</td>
<td>3</td>
</tr>
</tbody>
</table>
CSI 3372  Software Engineering II  3
CSI 3439  Computer Architecture  4
CSI 3471  Software Engineering I  4
CSI 4321  Data Communications  3
CSI 3430  Foundations of Computing  3
CSI 4337  Introduction to Operating Systems  3
CSI 43C9  Capstone Design Project  3
CSI 4301  Cultural Impact of the Computer  3

or PHI 1310  Computer Ethics  

CSI 3000 or CSI 4000 level electives  6

A grade of “C” or better is required in all computer science hours counted toward major.

**Sciences**

Select one group from the following natural or physical sciences:  14-16

**Group 1**

BIO 1305 & BIO 1105  Modern Concepts of Bioscience and Modern Concepts of Bioscience Laboratory

BIO 1306 & BIO 1106  Modern Concepts of Bioscience, continued and Modern Concepts of Bioscience Laboratory

**Group 2**

CHE 1301 & CHE 1101  Basic Principles of Modern Chemistry I and General Chemistry Laboratory I

CHE 1302 & CHE 1102  Basic Principles of Modern Chemistry II and General Chemistry Laboratory II

**Group 3**

GEO 1405  The Dynamic Earth

GEO 1306 & GEO 1106  The Earth Through Time and The Earth Through Time, Laboratory

**Group 4**

Select one of the following:

PHY 1408 & PHY 1409  General Physics for Natural and Behavioral Sciences I and General Physics for Natural and Behavioral Sciences II

PHY 1420 & PHY 1430  General Physics I and General Physics II

**Additional Science Courses**

Six to eight additional hours of science from the courses above or from courses have one or more of the above courses as prerequisites. If a ‘1000’ level course is chosen, coordinating lab must be taken as well.

**Contemporary Social Issues**

Select 6 hours from the corresponding A&S Distribution List 2  6

**Mathematics**

MTH 2311  Linear Algebra  3

or MTH 2321  Calculus III

**Total Hours**  81-83

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1  CSI 3303 Information Technology is not applicable to the major in computer science or as degree electives without written permission from the Computer Science Department Chair.

2  HIS 1300 The United States in Global Perspective included
Six to eight additional hours of science from the courses above or from courses which have one or more of the above courses as prerequisites. If a '1000' level course is chosen, coordinating lab must be taken as well.

**Technical Elective**

Select one of the following: 3

- STA - with STA 3381 as a prerequisite
- MTH 2321 Calculus III
- MTH 3312 Foundations of Combinatorics and Algebra
- MTH 3370 Mathematical Methods of Operations Research

Any 4000-level MTH course not required for Software Engineering track.

ELC 4330 Introduction to Robotics
- ELC 4353 Image Formation and Processing
- ELC 4438 Embedded Systems Design

**Contemporary Social Issues**

Select 3 hours from the corresponding A&S Distribution List 1

**Additional Courses**

- ECO 1305 Issues in Economics for Non-Business Majors 3
- MTH 2311 Linear Algebra 3
  or MTH 2321 Calculus III

**Total Hours** 84-86

1 HIS 1300 The United States in Global Perspective included

**Option C - Computer Science Major (Cybersecurity Concentration)**

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<tr>
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<td>CSI 3344</td>
<td>Introduction to Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CSI 3471</td>
<td>Software Engineering I</td>
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<tr>
<td>CSI 4321</td>
<td>Data Communications</td>
<td>3</td>
</tr>
<tr>
<td>CSI 4323</td>
<td>Introduction to Cybersecurity</td>
<td>3</td>
</tr>
<tr>
<td>CSI 4325</td>
<td>Advanced Cybersecurity</td>
<td>3</td>
</tr>
<tr>
<td>CSI 4330</td>
<td>Foundations of Computing</td>
<td>3</td>
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<tr>
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<tr>
<td>CSI 4301</td>
<td>Cultural Impact of the Computer</td>
<td>3</td>
</tr>
</tbody>
</table>
  or PHI 1310 Computer Ethics
| CSI 4111 | Cybersecurity Laboratory (three semesters)      | 3     |

A grade of “C” or better is required in all computer science hours counted toward major.

**Mathematics**

- MTH 2311 Linear Algebra 3
- MTH 4312 Cryptology 3

**Political Science**

- PSC 3355 The Causes of War 3
  or PSC 4395 Terrorism

**Contemporary Social Issues**

Select 3 hours from the corresponding A&S Distribution List 1

**Sciences**

Select one group from the following natural or physical sciences:

**Group 1**

- BIO 1305 Modern Concepts of Bioscience 8
  & BIO 1105 Modern Concepts of Bioscience
- BIO 1306 Laboratory and Modern Concepts of Bioscience, continued
  & BIO 1106 Laboratory and Modern Concepts of Bioscience

**Group 2**

- CHE 1301 Basic Principles of Modern Chemistry I 8
  & CHE 1101 Basic Principles of Modern Chemistry
  & CHE 1302 Basic Principles of Modern Chemistry II
  & CHE 1102 Basic Principles of Modern Chemistry Laboratory II

**Group 3**

- GEO 1405 The Dynamic Earth and The Earth Through Time 8
  & GEO 1306 and The Earth Through Time, Laboratory

**Group 4**

- PHY 1408 General Physics for Natural and Behavioral Sciences I 16
  & PHY 1409 General Physics for Natural and Behavioral Sciences II
  & PHY 1420 General Physics I
  & PHY 1430 General Physics II

Six to eight additional hours of science from the courses below or from courses, which have one or more of the above courses as prerequisites.

**Total Hours** 115-117

1 HIS 1300 The United States in Global Perspective included