COMPUTER SCIENCE MAJOR:
CYBERSECURITY OPTION
(B.A.)

https://ceps.unh.edu/computer-science/program/ba/computer-science-major-cybersecurity-option

Description
The B.A. in Computer Science will allow students to combine the study of computer science with the study of another field. Given the emergence of computational approaches to virtually all areas of scholarship and creative expression, it is important to offer this flexibility. The three tracks in the B.A. program contain the same computer science core as the B.S. program, but give more control to the student to choose the complementary and advanced courses.

Requirements

Degree Requirements
Minimum Credit Requirement: 128 credits
Minimum Residency Requirement: 32 credits must be taken at UNH
Minimum GPA: 2.0 required for conferral*
Core Curriculum Required: Discovery & Writing Program Requirements
Foreign Language Requirement: Yes
All Major, Option and Elective Requirements as indicated.
*Major GPA requirements as indicated.

Major Requirements
Computer science majors must maintain an overall grade-point average of 2.0 or better in all required computer science, mathematics, and computer engineering courses in order to graduate. If at the end of any semester, including the first, a student’s cumulative grade-point average in these courses falls below 2.0, the student may not be allowed to continue as a CS major.

The following courses must be passed with a grade of C- or better: CS 410C, CS 410P, CS 415, CS 416, CS 420, CS 515, CS 520, IT 403

If a student wishing to transfer into the computer science major has any coursework that is applicable to the major, the grades in those courses must satisfy the minimum grade requirements for the B.S. degree in computer science. The student must have an overall grade-point average of 2.0 or better in all courses taken at the university.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CS 400</td>
<td>Introduction to Computing</td>
<td>2</td>
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<tr>
<td>CS 415</td>
<td>Introduction to Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>or CS 410C</td>
<td>Introduction to Scientific Programming/C</td>
<td>4</td>
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<tr>
<td>or CS 410P</td>
<td>Introduction to Scientific Programming/Python</td>
<td>4</td>
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<tr>
<td>CS 416</td>
<td>Introduction to Computer Science II</td>
<td>4</td>
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<tr>
<td>CS 420</td>
<td>Foundations of Programming for Digital Systems</td>
<td>4</td>
</tr>
<tr>
<td>IT 403</td>
<td>Introduction to Internet Technologies</td>
<td>4</td>
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<tr>
<td>CS 501</td>
<td>Professional Ethics and Communication in Technology-related Fields</td>
<td>4</td>
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<tr>
<td>CS 515</td>
<td>Data Structures and Introduction to Algorithms</td>
<td>4</td>
</tr>
<tr>
<td>CS 520</td>
<td>Computer Organization and System Level Programming</td>
<td>4</td>
</tr>
<tr>
<td>CS 527</td>
<td>Fundamentals of Cybersecurity</td>
<td>4</td>
</tr>
<tr>
<td>CS 620</td>
<td>Operating System Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>CS 727</td>
<td>Software Security</td>
<td>4</td>
</tr>
<tr>
<td>IT 666</td>
<td>Cybersecurity Practices</td>
<td>4</td>
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<tr>
<td>CS 791</td>
<td>Senior Project I</td>
<td>4</td>
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<tr>
<td>&amp; CS 792</td>
<td>and Senior Project II</td>
<td>4</td>
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<tr>
<td>or CS 799</td>
<td>Thesis</td>
<td>4</td>
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Computer Science Electives
Select one course from the following:
- CS 720  Systems Programming
- CS 722  Cloud Computing Systems
- CS 725  Computer Networks
- IT 609  Network/Systems Administration
- IT 718  Cloud Computing Principles

Mathematics Courses
- MATH 425  Calculus I
- MATH 539  Introduction to Statistical Analysis
- MATH 644  Statistics for Engineers and Scientists
Select two courses from the following:
- MATH 420  Finite Mathematics
- MATH 426  Calculus II
- MATH 445  Mathematics and Applications with MATLAB

Any MATH 500-level course or higher

Science Courses
- Discovery Biological Science (BS) with Discovery Lab
- Discovery Physical Science (PS) with Discovery Lab
- Discovery requirements not already covered by required courses

Total Credits: 98

1 Courses must carry the Discovery attributes of Biological Science or Physical Science and include Discovery lab (DLAB).

Sample Degree Plan

Degree Plan

Sample Degree Plan

First Year
Fall  | Credits | CS 400  | Introduction to Computing | 2
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<tr>
<td></td>
<td></td>
<td>MATH 425</td>
<td>Calculus I</td>
<td>4</td>
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<td></td>
<td>ENGL 401</td>
<td>First-Year Writing</td>
<td>4</td>
</tr>
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Credits: 18

Spring
CS 416 | Introduction to Computer Science II | 4
CS 420 | Foundations of Programming for Digital Systems | 4
MATH 539 | Introduction to Statistical Analysis | 4
ENGL 401 | First-Year Writing | 4

Credits: 16

Second Year
Fall
CS 515 | Data Structures and Introduction to Algorithms | 4
CS 527 | Fundamentals of Cybersecurity | 4
### Third Year

**Fall**
- CS 620 Operating System Fundamentals 4
- IT 666 Cybersecurity Practices 4
- MATH Elective II 4
- Discovery V 4

**Credits**: 16

**Spring**
- CS 727 Software Security 4
- Discovery VI 4
- General Elective I 4
- General Elective II 4

**Credits**: 16

### Fourth Year

**Fall**
- CS 791 Senior Project I 2
- CS 700-level Elective I 4
- Discovery VII 4
- General Elective III 4
- General Elective IV 4

**Credits**: 18

**Spring**
- CS 792 Senior Project II 2
- CS 700-level Elective II 4
- General Elective V 4
- General Elective VI 4

**Credits**: 14

**Total Credits**: 130

**Discovery (7):** Historical Perspectives, Humanities, Fine and Performing Arts, Social Science, World Cultures, Physical Science Discovery Lab, Biological Science Discovery Lab.

Two Discovery or General Elective courses must have the Writing Intensive (WI) attribute.

### Student Learning Outcomes

Graduates of the UNH B.A. CS programs will have an ability to:

- Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Apply computer science theory and software development fundamentals to produce computing-based solutions.
- Learn independently about new technologies, and have the skills needed to understand them.