COMPUTER SCIENCE MAJOR (B.A.) MANCHESTER

https://manchester.unh.edu/program/ba/computer-science-major

Description

The computer science program combines a solid foundation in computing necessary to succeed in today’s start-up and high-tech environments. The program is designed in response to market demand for students proficient in computer science.

Students in the computer science program gain real-world experience through extensive project work and opportunities to interact with industry experts through internships and sponsored research.

Career prospects for students with an undergraduate computer science degree are varied, and may include such areas as applications developer, computer and information research scientist, data security specialist, database administrator, database developer, multimedia developer, network architect, product development manager, quality assurance analyst, software systems developer, user experience designer, or web developer.

Program Educational Objectives

Within five years of graduation, a CS student should be able to:

• Demonstrate mastery of the core areas of computer science
• Invent, develop, manage, and evaluate computing systems and services
• Exercise professional responsibility and have appreciation of the social, legal, ethical, and cultural issues inherent in the computing field.

Student Outcomes

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.

Requirements

Students majoring in computer science must complete 128 credits to graduate, satisfy the University’s Discovery Program, and complete 69 credits in the major with a minimum of C- in each course. Students must maintain an overall cumulative GPA of 2.0 or better.

Transfer students who elect to major in computer science must earn 73 approved credits for completion of the their major, of which at least 24 credits must be completed at UNH Manchester.

Program Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMP 500</td>
<td>Discrete Structures</td>
<td>4</td>
</tr>
<tr>
<td>COMP 570</td>
<td>Statistics in Computing and Engineering</td>
<td>4</td>
</tr>
<tr>
<td>MATH 425</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 645</td>
<td>Linear Algebra for Applications</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 407</td>
<td>General Physics I</td>
<td>4</td>
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Computing Core

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMP 415</td>
<td>Mobile Computing First and For Most</td>
<td>4</td>
</tr>
<tr>
<td>COMP 424</td>
<td>Applied Computing 1: Foundations of Programming</td>
<td>4</td>
</tr>
<tr>
<td>COMP 430</td>
<td>Systems Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>COMP 525</td>
<td>Data Structures Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>COMP 530</td>
<td>Machine and Network Architecture</td>
<td>4</td>
</tr>
<tr>
<td>COMP 550</td>
<td>Ethics and the Law in the Digital Age</td>
<td>4</td>
</tr>
<tr>
<td>COMP 625</td>
<td>Data Structures and Algorithms</td>
<td>4</td>
</tr>
<tr>
<td>COMP 630</td>
<td>Systems Software</td>
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Project and Professional Practice

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMP 690</td>
<td>Internship Experience</td>
<td>4</td>
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<tr>
<td>COMP 790</td>
<td>Capstone Project</td>
<td>4</td>
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<tr>
<td>UMST 582</td>
<td>Internship and Career Planning Seminar</td>
<td>1</td>
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</table>

Computing Topics

Select two from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMP 705</td>
<td>Full Stack Development</td>
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</tr>
<tr>
<td>COMP 715</td>
<td>Information Security</td>
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</tr>
<tr>
<td>COMP 720</td>
<td>Database Systems and Technologies</td>
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<tr>
<td>COMP 725</td>
<td>Programming Languages</td>
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<tr>
<td>COMP 740</td>
<td>Machine Learning Applications and Tools</td>
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Total Credits 69

1. The program requires four mathematics courses and one physics course.
2. The program prepares students for the workforce and further education in a holistic way by emphasizing communication, collaboration, team work, initiative, appreciation for diversity, and self-direction and responsibility.
3. Advisor permission required.

For additional information about the computer science program, contact Michael Jonas at Michael.Jonas@unh.edu or contact the UNH Manchester Office of Admissions, (603) 641-4150; unhm.admissions@unh.edu.

Degree Plan

Sample Course Sequence

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>First Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP 424</td>
<td>Applied Computing 1: Foundations of Programming</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 401</td>
<td>First-Year Writing</td>
<td>4</td>
</tr>
<tr>
<td>MATH 425</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>UMST 401</td>
<td>First Year Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Discovery Course</td>
<td></td>
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Credits 17
Computer Science Major (B.A.) Manchester

Spring
COMP 415 Mobile Computing First and For Most 4
COMP 430 Systems Fundamentals 4
COMP 570 Statistics in Computing and Engineering 4
PHYS 407 General Physics I 4
Credits 16

Second Year
Fall
COMP 500 Discrete Structures 4
COMP 525 Data Structures Fundamentals 4
Discovery Course 4
Foreign Language 4
Credits 16

Spring
COMP 530 Machine and Network Architecture 4
COMP 560 Ethics and the Law in the Digital Age 4
MATH 645 Linear Algebra for Applications 4
Discovery Course 4
Credits 16

Third Year
Fall
COMP 625 Data Structures and Algorithms 4
UMST 582 Internship and Career Planning Seminar 1
Discovery Course 4
Elective Course 4
Elective Course 4
Credits 17

Spring
COMP 630 Systems Software 4
COMP 690 Internship Experience 4
Discovery Course 4
Elective Course 4
Credits 16

Fourth Year
Fall
COMP Topic Course 4
COMP Topic Course 4
Elective Course 4
Elective Course 4
Credits 16

Spring
COMP 790 Capstone Project 4
COMP Topic Course 4
Elective Course 4
Elective Course 4
Credits 16

Total Credits 130

Student Learning Outcomes

- 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.