COMPUTER SCIENCE - BACHELOR OF ARTS (BA)

Overview of the Major

Computer science is an exciting and challenging field that has impact on many parts of our lives. Computer scientists craft the technologies that enable the digital devices we use every day. They develop the large-scale software that powers business and industry, and they advance the computational techniques and write the software that supports scientists in their study of the world around us. They create the software that social scientists use to identify and analyze patterns in the behavior of social groups and human behavior in social networks and the applications that humanists and linguists use to research language development. Many new applications of computing technology remain to be discovered. Indeed, computing will be at the heart of future revolutions in business, science, and society. Students who study computer science now will be at the forefront of those important advances.

Computer science is concerned with how computers are constructed, how they store and process data, how they are used in problem solving, and how the quality of those solutions is assessed. It is about the science of creating software for a variety of users. It is about understanding how that software interacts with the hardware on which it is run. Computer science goes well beyond the machine to the study of how people interact with the technologies around them. Applications of computer science reach far and wide.

Career Possibilities

Computer science graduates from the University of Colorado Boulder are engaged in a wide variety of jobs with many different companies in locations all over the world. They produce the software and systems that touch lives every day in fields ranging from communications to finance to publishing. They are, of course, software developers, but also have become teachers, writers, doctors, lawyers, scientists, military leaders, and entrepreneurs. They work at some of the largest, most influential companies in the world, at research institutions, non-profits, and at the smallest start-ups of every type imaginable. And many lead highly successful companies that they themselves have founded.

Career Services offers a number of programs and services designed to help you plan your career, including workshops, internships, and placement services after graduation. For an appointment with a career counselor or for more information, call 303-492-6541, or stop by the Center for Community. Find more information at Career Services (http://www.colorado.edu/career).

Facilities, Programs, and Opportunities

The Department of Computer Science uses a modern computing infrastructure that supports its research and educational missions. The department has a variety of computing facilities for use by faculty, staff, and students. These include general purpose computing labs provided by the university, additional instructional labs and administrative computing resources provided by the department, and specialized labs dedicated to the work of individual research groups. A wide variety of computing resources are available so that students have the opportunity to learn about and use cutting-edge equipment and software.

The Undergraduate Research Opportunities Program (UROP) offers students a chance to work alongside a faculty sponsor on original research. Learn to write proposals, conduct research, pursue creative work, analyze data, and present the results. For more information, call UROP at 303-492-2596 or visit the UROP website (http://www.colorado.edu/suep/urop). The Department provides networking opportunities throughout the year for students to meet with companies looking to hire students for paid internships. CU’s location near Boulder's tech startup community, national research labs, and traditional tech companies such as Google, IBM, Oracle, Microsoft, and the like provide students with computer science skills a wide range of employment opportunities while working on earning their degrees.

Advising

If you would like to speak to an advisor about the BA in CS degree program Eva Lacy (eva.lacy@colorado.edu). Current A&S students may also use the A&S advising website (http://advising.colorado.edu) to schedule an appointment with Eva.

A student may not earn both the BS in computer science from the College of Engineering and Applied Science and the BA in computer science from the College of Arts and Sciences. A student may not earn both a bachelor’s degree in computer science and the minor in computer science from CU Boulder.

Required Courses and Credit Hours

Students must complete the general requirements of the College of Arts and Sciences, including approximately 46 credit hours in the core curriculum and the required courses listed below. Credit hours in the major may also apply toward these core courses.

Foundation

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CSCI 1300 or CSCI 1310</td>
<td>Computer Science 1: Starting Computing</td>
<td>4</td>
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<tr>
<td>CSCI 2270</td>
<td>Computer Science 2: Data Structures</td>
<td>4</td>
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<tr>
<td>CSCI 2400</td>
<td>Computer Systems</td>
<td>4</td>
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<tr>
<td>CSCI 2824</td>
<td>Discrete Structures (or other CS department approved Discrete Math course)</td>
<td>3</td>
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Core Courses

Select four of the following: 12-15

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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>CSCI 3002</td>
<td>HCC Foundations/User-Centered Design and Development 1</td>
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<tr>
<td>CSCI 3104</td>
<td>Algorithms</td>
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<tr>
<td>CSCI 3155</td>
<td>Principles of Programming Languages</td>
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<tr>
<td>CSCI 3202</td>
<td>Introduction to Artificial Intelligence</td>
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<tr>
<td>CSCI 3287</td>
<td>Design and Analysis of Data Systems</td>
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<tr>
<td>CSCI 3308</td>
<td>Software Development Methods and Tools</td>
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<tr>
<td>CSCI 3434</td>
<td>Theory of Computation</td>
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<tr>
<td>CSCI 3656</td>
<td>Numerical Computation</td>
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<tr>
<td>CSCI 3753</td>
<td>Design and Analysis of Operating Systems</td>
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<tr>
<td>CSCI 4448</td>
<td>Object-Oriented Analysis and Design</td>
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Upper Division CSCI Electives

Three or four upper-division CSCI courses 12-15

Acillary Mathematics

Select one of the following Calculus sequences: 8-12
### Computer Science - Bachelor of Arts (BA)

#### Sequence 1:
- **APPM 1350**: Calculus 1 for Engineers
- **APPM 1360**: and Calculus 2 for Engineers

#### Sequence 2:
- **APPM 1340**: Calculus 1 with Algebra, Part A
- **APPM 1345**: Calculus 1 with Algebra, Part B
- **APPM 1360**: Calculus 2 for Engineers

#### Sequence 3:
- **MATH 1300**: Calculus 1
- **MATH 2300**: and Calculus 2

Select one of the following courses in either Linear Algebra or Probability/Statistics: 3-4

#### Linear Algebra:
- **APPM 3310**: Matrix Methods and Applications
- **CSCI 2820**: Linear Algebra with Computer Science Applications
- **MATH 2130**: Introduction to Linear Algebra for Non-Mathematics Majors

#### Probability/Statistics:
- **APPM 3570**: Applied Probability
- **APPM 4570**: Statistical Methods
- **ECON 3818**: Introduction to Statistics with Computer Applications
- **MATH 3510**: Introduction to Probability and Statistics
- **MATH 4510**: Introduction to Probability Theory

Total Credit Hours: 50-61

**Graduating in Four Years**

In order for the Four-Year Guarantee to apply, an arts and sciences student would need to have:

- Enrolled in the BA in computer science major and have taken Calculus 1 and CSCI 1300 (or CSCI 1310) by their second semester.

For more information, visit the department in Engineering Center, ECOT 717 or visit the Computer Science department (http://www.colorado.edu/cs) website.