COMPUTER SCIENCE, BS

Introduction

Please click here (http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/computer-science-engineering/) to see computer science department information.

Undergraduate computer science students at CU Denver are able to tailor their degree to their interests and goals. Students are exposed to the breadth of the field including machine learning & data science, computer graphics & game design, programming, software engineering, systems, scientific computing, secure computing, theory and cyber-physical systems.

The computer science bachelor of science program is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org.

The educational objectives of the computer science undergraduate program are to produce graduates who:

- Advance professionally as productive, practicing professionals in computer science and related careers through the continued development of their expertise and skills.
- Further develop their knowledge, skill set, and career opportunities through graduate education and/or professional studies.
- Function effectively as part of a team to succeed in their professional careers.

Program Delivery

- This is an on-campus program.

Declaring This Major

- Click here (http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/#policiestext) to go to information about declaring a major.

General Requirements

To earn a degree, students must satisfy all requirements in each of the areas below, in addition to their individual major requirements.

- CU Denver General Graduation Requirements (http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation/)
- CU Denver Core Curriculum (http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation-undergraduate-core-requirements/)
- College of Engineering, Design and Computing Graduation Requirements (http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/#graduationrequirementstext)
- Click here (http://catalog.ucdenver.edu/cu-denver/undergraduate/academic-policies-procedures/) for information about Academic Policies

Program Requirements

1. Students must maintain a minimum 2.0 GPA in all courses applying to major requirements.
2. Students must maintain a minimum 2.0 GPA in all CSCI courses attempted.
3. Undergraduate students in the CSE department are required to have a personal laptop before starting 3000-level classes that satisfies the requirements listed on the CSE Laptop Requirement Website (https://engineering.ucdenver.edu/laptops/#ac-computer-science-bachelor-of-science-master-of-science-3).

The BS computer science degree requires 128 credits including: 24 credits of CU Denver Core Curriculum, 12 credits of mathematics, 10 credits of physical science, 3 credits of engineering design, and 79 credits of computer science.

Code	Title	Hours
CU Denver Core Curriculum		
Select 24 credits		24
Engineering Design		
ENGR 1200	Fundamentals of Engineering Design Innovation	3
Computer Science		
CSCI 1410	Fundamentals of Computing [4]	3
CSCI 1411	Fundamentals of Computing Laboratory [4]	1
CSCI 2312	Object Oriented Programming [4]	3
CSCI 2421	Data Structures and Program Design [4]	3
CSCI 2511	Discrete Structures [4]	3
CSCI 3287	Database System Concepts [4]	3
CSCI 3412	Algorithms [4]	3
CSCI 3508	Introduction to Software Engineering [4]	3
CSCI 4034	Theoretical Foundations of Computer Science	3
Computer Science Core		
CSCI 1510	Logic Design [4]	3
CSCI 2525	Assembly Language and Computer Organization [4]	3
CSCI 3415	Principles of Programming Languages [4]	3
CSCI 3453	Operating System Concepts [4]	3
CSCI 3761	Introduction to Computer Networks [4]	3
CSCI 4551	Parallel & Distributed Computing	3
CSCI 4591	Computer Architecture	3
Capstone Courses		
CSCI 4738	Senior Design I [4]	3
CSCI 4739	Senior Design II	3
Data Science		
Select one of the following:		3
CSCI 4455	Data Mining	
CSCI 4580	Data Science	
CSCI 4702	Big Data Mining	
CSCI 4930	Machine Learning	
CSCI 4931	Deep Learning	
CSCI 4951	Big Data Systems	
Scientific Computing		
Select one of the following:		3
CSCI 3560	Probability and Computing	
CSCI 4110	Applied Number Theory	
CSCI 4407	Security & Cryptography	
CSCI 4620	Computational Motor Control	
CSCI 4650	Numerical Analysis I	

Secure Computing		
Select one of the following:		3
CSCI 4741	Principles of Cybersecurity	
CSCI 4742	Cybersecurity Programming and Analysis	
CSCI 4743	Cyber and Infrastructure Defense	
System Software		
Select two of the following:		6
CSCI 3511	Hardware-Software Interface	
CSCI 4287	Embedded Systems Programming	
CSCI 4565	Introduction to Computer Graphics	
CS Technical Electives		
Select four courses of any 3000-level or above Computer Science (CSCI) course that is not applied to the above 67 credits. [3]		12
Mathematics		
MATH 1401	Calculus I [4]	4
MATH 2411	Calculus II [4]	4
MATH 3195	Linear Algebra and Differential Equations [1,4]	4
Science		
Select a two-course sequence with lab of the following:		10
Choice 1 [2]		
BIOL 2010 & BIOL 2011	Organisms to Ecosystems (Gen Bio) and Organisms to Ecosystems Lab (Gen Bio) [4]	
BIOL 2020 & BIOL 2021	Molecules to Cells (Gen Bio) and Molecules to Cells Lab (Gen Bio)	
Choice 2 [2]		
CHEM 2031 & CHEM 2038	General Chemistry I and General Chemistry Laboratory I [4]	
CHEM 2061 & CHEM 2068	General Chemistry II and General Chemistry Laboratory II	
Choice 3		
PHYS 2311 & PHYS 2321	General Physics I: Calculus-Based and Intro Experimental Phys Lab I [4]	
PHYS 2331 & PHYS 2341	General Physics II: Calculus-Based and Intro Experimental Phys Lab II	
Total Hours		**128**

1. Students can substitute both MATH 3191 Applied Linear Algebra and MATH 3200 Elementary Differential Equations for MATH 3195 Linear Algebra and Differential Equations.
2. Additional credits needed to reach 10 may come from an advanced science course beyond CHEM 2061 General Chemistry II or beyond BIOL 2020 Molecules to Cells (Gen Bio), an additional CS elective, MATH 2421 Calculus III, a 3000/4000 level MATH course, or ENGR 4150 Seminar: Special Topics in Engineering.
3. Students may apply up to 3 credits of approved CSCI internship to the CS Technical Electives requirement.
4. Must be completed with a B- or higher.

Measurable Outcomes

The bachelor of science in computer science program must enable its students to attain, by the time of graduation:

- 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.

To review the Degree Map for this program, please visit our website (https://www.ucdenver.edu/student/advising/undergraduate/degree-maps/cedc/).