



## PROGRAM OVERVIEW

The computer scientist is a professional who must be prepared to apply his or her skills, knowledge and creativity in a rapidly changing field. The Bachelor of Science in computer science at CU Denver prepares students for such creative work. The emphasis is on fundamental concepts and basic principles with a long useful life. The Computer Science Bachelor of Science program is accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>. The Program Educational Objectives of the undergraduate computer science program are to produce graduates who:

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

## ACADEMIC ADVISING

Advising in the College of Engineering, Design and Computing (CEDC) depends on your student standing—undergraduate students either are pre-engineering or are admitted to the college, depending on degree progress. *Students admitted to the College of Engineering, Design and Computing (CEDC) who have declared a major are required to meet with an advisor in their specific department and should contact that department to schedule an appointment.*

### Computer Science & Engineering

[computerscience@ucdenver.edu](mailto:computerscience@ucdenver.edu)

Visit the department website [here](#)

Lawrence Street Center, 8<sup>th</sup> Floor, 303-315-1408

## GENERAL GRADUATION REQUIREMENTS & POLICIES

All CU Denver CEDC CS students are required to complete the following minimum general graduation requirements:

1. Complete a minimum of 128 semester hours
2. Achieve a minimum 2.0 CU cumulative grade point average (GPA)
3. Complete all college and major requirements
4. Residency: complete a minimum of 30 CEDC hours as a declared CEDC student in good standing at CU Denver
5. Terminal Residency: complete at least the final two semesters as an enrolled CEDC student

## PROGRAM REQUIREMENTS & POLICIES

**Students are responsible for meeting with the faculty advisor in their department to confirm major requirements.** Students completing the Computer Science B.S. Degree are required to complete the following minimum program requirements:

1. Complete 24 semester hours of **CU Denver Core Curriculum coursework**.
2. Complete 3 semester hours of **Engineering Design**
3. Complete a minimum of 46 semester hours of **required computer science & computer science systems core courses**
4. Complete 21 semester hours of **computer science breadth courses**
5. Complete a minimum of 12 semester hours of **computer science technical electives**
6. Complete 22 semester hours of **mathematics and science**

Courses	Credits	Notes
<b>* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *</b>		
<b>Required CU Denver Core Curriculum Coursework</b>	<b>24</b>	<a href="#">CUDenver Core</a>
<b>Required Engineering Design Courses</b>	<b>3</b>	
ENGR 1200 Fundamentals of Engineering Design Innovation	3	
<b>Required Computer Science Core Courses</b>	<b>25</b>	
CSCI 1410 Fundamentals of Computing	3	<i>Co-Requisite: CSC 1411</i>
CSCI 1411 Fundamentals of Computing Lab	1	<i>Co-Requisite: CSC 1410</i>
CSCI 2312 Object Oriented Programming	3	<i>*Prerequisite: CSCI 1410 &amp; 1411</i>
CSCI 2421 Data Structures & Program Design	3	<i>*Prerequisite: CSCI 2312</i>
CSCI 2511 Discrete Structures	3	<i>*Prerequisite: MATH 1401</i>
CSCI 3287 Database Systems	3	<i>*Prerequisite: ENGL 1020, CSCI 2421</i>
CSCI 3412 Algorithms	3	<i>*Prerequisite: CSCI 2421 &amp; 2511</i>
CSCI 3508 Introduction to Software Engineering	3	<i>*Prerequisite: CSCI 3412</i>
CSCI 4034 Theoretical Foundations of Computer Science	3	<i>*Prerequisite: CSCI 3412</i>
<b>Required Computer Science Systems Core Courses</b>	<b>21</b>	
CSCI 1510 Logic Design	3	
CSCI 2525 Assembly Language & Computer Organization	3	<i>*Prerequisite: CSCI 1510 &amp; 2312</i>
CSCI 3415 Principles of Programming Languages	3	<i>*Prerequisite: CSCI 2421 &amp; 2525</i>
CSCI 3453 Operating Systems Concepts	3	<i>*Prerequisite: CSCI 3412 &amp; 2525</i>
CSCI 3761 Introduction to Computer Networks	3	<i>*Prerequisite: CSCI 2421</i>
CSCI 4551 Parallel & Distributed Computing	3	<i>*Prerequisite: MATH 3195, CSCI 3415 &amp; 3453</i>
CSCI 4591 Computer Architecture	3	<i>*Prerequisite: CSCI 2525</i>
<b>CS Breadth: Capstone Project (Take Two)</b>	<b>6</b>	
CSCI 4738 Senior Design Project I	3	<i>*Prerequisite: CSCI 3287, 3415, 3453, &amp; 3508</i>
CSCI 4739 Senior Design Project II	3	<i>*Prerequisite: CSCI 4738</i>
<b>CS Breadth: Data Science (Take One)</b>	<b>3</b>	
CSCI 4455 Data Mining	3	<i>*Prerequisite: MATH 3195 or 3191, CSCI 3287 &amp; 3412</i>
CSCI 4580 Data Science	3	<i>*Prerequisite: MATH 3195 or 3191, CSCI 3287 &amp; 3412</i>
CSCI 4930 Machine Learning	3	<i>*Prerequisite: MATH 3195 or 3191&amp; CSCI 3412</i>
CSCI 4931 Deep Learning	3	<i>*Prerequisite: MATH 3195 or 3191&amp; CSCI 3412</i>



CSCI 4951 Big Data Systems	3	*Prerequisite: MATH 3195 or 3191, CSCI 3287 & CSCI 3412
Courses	Credits	Notes
<b>* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *</b>		
<b>CS Breadth: Scientific Computing (Take One)</b>	<b>3</b>	
CSCI 3560 Probability & Computing	3	*Prerequisite: MATH 2411 & CSCI 2511
CSCI 4650 Numerical Analysis I	3	*Prerequisite: MATH 2411, MATH 3191 or 3195
CSCI 4110 Applied Number Theory	3	*Prerequisite: CSCI 2511 or MATH 3000
<b>CS Breadth: Secure Computing (Take One)</b>	<b>3</b>	
CSCI 4741 Principles of Cyber Security	3	*Prerequisite: CSCI 3761
CSCI 4742 Cybersecurity Programming & Analysis	3	*Prerequisite: CSCI 3415
CSCI 4743 Cyber and Infrastructure Defense	3	*Prerequisite: CSCI 3761
<b>CS Breadth: System Software (Take Two)</b>	<b>6</b>	
CSCI 3511 Hardware/Software Interface	3	*Prerequisite: CSCI 2525
CSCI 4287 Embedded Systems Programming	3	*Prerequisite: CSCI 3453
CSCI 4565 Introduction to Computer Graphics	3	*Prerequisite: CSCI 3412 & MATH 3191 or 3195
<b>Required Mathematics</b>	<b>12</b>	
MATH 1401-4 Calculus I	4	*Prerequisite: (MATH 1120 or 1130) and placement exam
MATH 2411-4 Calculus II	4	*Prerequisite: MATH 1401
MATH 3195-4 Linear Algebra and Differential Equations	4	*Prerequisite: MATH 2411
<b>Required Science (Pick Choice 1, 2 or 3)</b> (*for additional credits to meet 10 see handbook)	<b>10</b>	For choice 1 & 2 addtl credits: CS course, science above chosen sequence, math beyond Calc II or ENGR elective (not gen-ed course)
<b>*Choice 1:</b> BIOL 2010 & 2011; BIOL 2020 & 2021	8	Check individual courses for prerequisites
<b>*Choice 2:</b> CHEM 2031 & 2038; CHEM 2061 & 2068	9	Check individual courses for prerequisites
<b>Choice 3:</b> PHYS 2311 & 2321; PHYS 2331 & 2341	10	Check individual courses for prerequisites
<b>CS Technical Electives</b> See handbook for additional information	<b>12</b>	Check individual courses for prerequisites
<b>Total Program Hours:</b>	<b>128</b>	

### SAMPLE ACADEMIC PLAN OF STUDY

The following academic plan is a *sample* pathway to completing degree requirements for this major. Students should tailor this plan based on previously completed college coursework (e.g., AP, IB, CLEP, dual/concurrent enrollment, and transfer credit), course availability, and individual preferences related to course load, schedules, or add-on programs such as minors or double-majors. **Students deviating from this plan must fulfill course prerequisites and must meet with their assigned advisor to confirm degree requirements.**

Year One	Semester 1	CRS
	CSCI 1410 FUNDAMENTALS OF COMPUTING	3
	CSCI 1411 FUNDAMENTALS OF COMPUTING LAB	1
	MATH 1401 CALCULUS I	4
	ENGR 1200 FUND OF ENGINEERING DESIGN INNOVATION	3
	CORE CURRICULUM ELECTIVE	3
	ENGL 1020 CORE COMPOSITION I	3

Semester 2	CRS
CSCI 2312 OBJECT ORIENTED PROGRAMMING	3
CSCI 2511 DISCRETE STRUCTURES	3
CSCI 1510 LOGIC DESIGN	3
CORE CURRICULUM ELECTIVE	3
ENGL 2030 CORE COMPOSITION II	3

Year Two	Semester 3	CRS
	CSCI 2421 DATA STRUCTURES & PROGRAM DESIGN	3
	CSCI 2525 ASSEMBLY LANGUAGE & COMPUTER ORG.	3
	MATH 2411 CALCULUS II	4
	CORE CURRICULUM ELECTIVE	3
CORE CURRICULUM ELECTIVE	3	

Semester 4	CRS
CSCI 3287 DATABASE SYSTEMS	3
CSCI 3412 ALGORITHMS	3
CSCI 3761 INTRODUCTION TO COMPUTER NETWORKS	3
MATH 3195 LINEAR ALGEBRA/DIFF EQUATIONS	4
CORE CURRICULUM ELECTIVE	3

Year Three	Semester 5	CRS
	CSCI 3415 PRIN PROGRAMMING LANG	3
	CSCI 3453 OPERATING SYSTEMS	3
	CS BREADTH	3
	CS TECHNICAL ELECTIVE	3
	SCIENCE CHOICE	3-4
SCIENCE CHOICE LAB	1	

Semester 6	CRS
CSCI 3508 SOFTWARE ENGINEERING	3
CS BREADTH	3
CS BREADTH	3
CS TECHNICAL ELECTIVE	3
SCIENCE CHOICE	3-4
SCIENCE CHOICE LAB	1

Year Four	Semester 7	CRS
	CSCI 4551 PARALLEL & DISTRIBUTED COMPUTING	3
	CS BREADTH: SENIOR DESIGN 1	3
	CS BREADTH	3
	CS TECHNICAL ELECTIVE	3
CORE CURRICULUM ELECTIVE	3	

Semester 8	CRS
CSCI 4034 THEORETICAL FOUND OF CS	3
CSCI 4591 COMPUTER ARCHITECTURE	3
CS BREADTH: SENIOR DESIGN 2	3
CS BREADTH	3
CS TECHNICAL ELECTIVE	3