College of Engineering, Design and Computing
UNIVERSITY OF COLORADO **DENVER**

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

Students admitted to the College of Engineering, Design and Computing (CEDC) are required to meet with their assigned advisor. Students can schedule an appointment through UCDAccess or by contacting the department to schedule an appointment.

Computer Science & Engineering
computerscience@ucdenver.edu
Visit the department website here
Lawrence Street Center, 8th 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 18 semester hours of **computer science breadth courses.**
5. Complete a minimum of 15 semester hours of **computer science technical electives.**
6. Complete 22 semester hours of **mathematics and science.**

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

	CRS	
CSCI 4702 Big Data Mining (*Students admitted Fall 2024 or after*)	3	**Prerequisite:* MATH 3195 or 3191, CSCI 3287 & CSCI 3412*
CSCI 4951 Big Data Systems	3	**Prerequisite:* MATH 3195 or 3191, CSCI 3287 & CSCI 3412*
CS Breadth: Scientific Computing (Take One)	**3**	
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*
CSCI 4407 Cryptography & Security (*Students admitted Fall 2023 or after*)	3	**Prerequisite:* CSCI 3412*
CSCI 4620 Computational Motor Control (*Students admitted Fall 2024 or after*)	3	**Prerequisite:* CSCI 3412*
CS Breadth: Secure Computing (Take One)	**3**	
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*
CS Breadth: System Software (Take One)	**3**	
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*
Required Mathematics	**12**	
MATH 1401-4 Calculus I	4	**Prerequisite:* (MATH 1120 or 1130) or placement exam*
MATH 2411-4 Calculus II	4	**Prerequisite:* MATH 1401*
MATH 3195-4 Linear Algebra and Differential Equations	4	**Prerequisite:* MATH 2411*
Required Science (Pick Choice 1, 2 or 3) (*for additional credits to meet 10 see handbook*)	**10**	*For choice 1 & 2 addtl credits: CS course, science above chosen sequence, math beyond Calc II or ENGR elective (not gen-ed course)*
*Choice 1: BIOL 2010 & 2011; BIOL 2020 & 2021	8	*Check individual courses for prerequisites*
*Choice 2: CHEM 2031 & 2038; CHEM 2061 & 2068	9	*Check individual courses for prerequisites*
Choice 3: PHYS 2311 & 2321; PHYS 2331 & 2341	10	*Check individual courses for prerequisites*
CS Technical Electives See handbook for additional information	**15**	*Check individual courses for prerequisites*
Total Program Hours:	**128**	

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
MATH 3195 LINEAR ALGEBRA/DIFF EQUATIONS	4
CORE CURRICULUM ELECTIVE	3
CORE CURRICULUM ELECTIVE	3

Year Three

Semester 5	CRS
CSCI 3508 SOFTWARE ENGINEERING	3
CSCI 3761 INTRODUCTION TO COMPUTER NETWORKS	3
CS BREADTH	3
CS TECHNICAL ELECTIVE	3
SCIENCE CHOICE	3-4
SCIENCE CHOICE LAB	1

Semester 6	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

Year Four

Semester 7	CRS
CSCI 4034 THEORETICAL FOUND OF CS	3
CSCI 4551 PARALLEL & DISTRIBUTED COMPUTING	3
CS BREADTH: SENIOR DESIGN 1	3
CS BREADTH	3
CS TECHNICAL ELECTIVE	3

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