College of Engineering and Applied Science
UNIVERSITY OF COLORADO
DENVER | ANSCHUTZ MEDICAL CAMPUS

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 and Applied Science (CEAS) depends on your student standing—undergraduate students either are pre-engineering or are admitted to the college, depending on degree progress. *Pre-engineering* students must meet with an advisor in the Academic Success and Advising Center (ASAC; Student Commons 1113; 303-315-1940) each semester before they can register for classes.

Students admitted to the College of Engineering and Applied Science (CEAS) 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
Visit the department website here
Lawrence Street Center, 8th Floor
303-315-1408

Students admitted to the College of Engineering and Applied Science who have not declared a major are required to meet with an advisor in the Engineering Student Services Center (ESSC).

Engineering Student Services Center (ESSC)
CEASstudentservices@ucdenver.edu
Visit the ESSC website here
North Classroom 2605
303-315-7510

GENERAL GRADUATION REQUIREMENTS & POLICIES

All CU Denver CEAS 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 CEAS hours as a declared CEAS student in good standing at CU Denver
5. Terminal Residency: complete at least the final two semesters as an enrolled CEAS 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 a minimum of 46 semester hours of **required computer science & computer science systems core courses**
3. Complete 21 semester hours of **computer science breadth courses**
4. Complete a minimum of 15 semester hours of **computer science technical electives**
5. 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	Create and link to a common CU Denver Core Curriculum Handout
Required Computer Science Core Courses	25	
CSCI 1410 Fundamentals of Computing	3	*Prerequisite: Freshman status, Co-Requisite: CSC 1411*
CSCI 1411 Fundamentals of Computing Lab	1	*Prerequisite: Freshman status, Co-Requisite: CSC 1410*
CSCI 2312 Object Oriented Programming	3	*Prerequisite: CSCI 1410, Co-Requisite: CSCI 2421*
CSCI 2421 Data Structures & Program Design	3	*Prerequisite: CSCI 1410, Co-Requisite: 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 2312 & 3412*
CSCI 4034 Theoretical Foundations of Computer Science	3	*Prerequisite: CSCI 2312 & 3412*
Required Computer Science Systems Core Courses	21	
CSCI 1510 Logic Design	3	*Prerequisite: Freshman status, MATH 1120/1130 or Equivalent*
CSCI 2525 Assembly Language & Computer Organization	3	*Prerequisite: CSCI 1410 & CSCI 1510*
CSCI 3415 Principles of Programming Languages	3	*Prerequisite: CSCI 2312,2421 & 2525*
CSCI 3453 Operating Systems Concepts	3	*Prerequisite: CSCI 2312,3412 & 2525*
CSCI 3761 Introduction to Computer Networks	3	*Prerequisite: CSCI 2312 & 2421*
CSCI 4551 Parallel & Distributed Systems	3	*Prerequisite: MATH 3195, CSCI 2312,3415 & 3453*
CSCI 4591 Computer Architecture	3	*Prerequisite: CSCI 2525*
Courses	Credits	Notes
* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *		
CS Breadth: Capstone Project (Take Two)	6	
CSCI 4738 Senior Design Project I	3	*Prerequisite: CSCI 3287, CSCI 3415, CSCI 3453, CSCI 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, CSCI 3287 & CSCI 3412*

CSCI 4580 Data Science	3	*Prerequisite: MATH 3195, CSCI 3287, CSCI 3412*
CSCI 4930 Machine Learning	3	***Prerequisite: MATH 3195 & CSCI 3412**
CSCI 4931 Deep Learning	3	***Prerequisite: MATH 3195 & CSCI 3412**
CSCI 4951 Big Data Systems	3	***Prerequisite: MATH 3195, 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**
CS Breadth: Secure Computing (Take One)	**3**	
CSCI 4741 Principles of Cyber Security	3	***Prerequisite: CSCI 3761 & 3287**
CSCI 4742 Cybersecurity Programming & Analysis	3	***Prerequisite: CSCI 3415**
CSCI 4743 Cyber and Infrastructure Defense	3	***Prerequisite: CSCI 3761**
CS Breadth: System Software (Take Two)	**6**	
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) and 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 2051 & 2071; BIOL 2061 & 2081	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 the faculty advisor in their department to confirm degree requirements.**

Year One

Semester 1	CRS
CSCI 1410 FUNDAMENTALS OF COMPUTING	3
CSCI 1411 FUNDAMENTALS OF COMPUTING LAB	1
CSCI 1510 LOGIC DESIGN	3
MATH 1401 CALCULUS I	4
ENGL 1020 CORE COMPOSITION I	3
CORE CURRICULUM ELECTIVE	3

Semester 2	CRS
CSCI 2312 OBJECT ORIENTED PROGRAMMING	3
CSCI 2421 DATA STRUCTURES & PROGRAM DESIGN	3
MATH 2411 CALCULUS II	4
ENGL 2030 CORE COMPOSITION II	3
CORE CURRICULUM ELECTIVE	3

Year Two

Semester 3	CRS
CSCI 2525 ASSEMBLY LANGUAGE & COMPUTER ORG.	3
CSCI 2511 DISCRETE STRUCTURES	3
SCIENCE CHOICE	3-4
SCIENCE CHOICE LAB	1
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
CS ELECTIVE	3
SCIENCE CHOICE	3-4
SCIENCE CHOICE LAB	1

Year Three

Semester 5	CRS
CSCI 3415 PRIN PROGRAMMING LANG	3
CSCI 3453 OPERATING SYSTEMS	3
CS BREADTH	3
CS BREADTH	3
CS ELECTIVE	3

Semester 6	CRS
CSCI 3508 SOFTWARE ENGINEERING	3
CS BREADTH	3
CS ELECTIVE	3
MATH 3195 LINEAR ALGEBRA/DIFF EQUATIONS	4
CORE CURRICULUM ELECTIVE	3

Year Four

Semester 7	CRS
CSCI 4034 THEORETICAL FOUND OF CS	3
CS BREADTH: SENIOR DESIGN 1	3
CSCI 4551 Parallel & Distributed Systems	3
CS BREADTH	3
CS ELECTIVE	3

Semester 8	CRS
CSCI 4591 COMPUTER ARCHITECTURE	3
CS BREADTH: SENIOR DESIGN 1	3
CS BREADTH	3
CS ELECTIVE	3
CORE CURRICULUM ELECTIVE	3