



University of Colorado Denver

Department of Computer Science and Engineering

Computer Science Bachelor of Science Handbook

Rules of the program leading to a Bachelor of Science in Computer Science

These degree requirements are in effect starting from 2024-2025 Admission.

The CSE department offers a [Bachelor of Science in Computer Science](#), a [Bachelor of Science in Cybersecurity](#), a [Bachelor of Arts in Computer Science](#), a [Minor in Computer Science](#), an undergraduate certificate in [Cybersecurity and Secure Computing](#), and a [Masters in Computer Science](#) as well as [two doctorate degrees](#) and [graduate certificates](#) in [Software Engineering](#) and [Cybersecurity and Defense](#). The department also offers a CS Scholars dual BS/MS program for students in the BSCS program.

Refer to this handbook for complete advising and degree requirements for the Bachelor of Science in Computer Science degree.

The Bachelor of Science Computer Science

The Bachelor of Science in Computer Science (BSCS) is a four year degree program. The BSCS gives students the foundational knowledge to tackle the wide range of tasks and applications that the field of computer science requires including emerging fields. Students gain knowledge through the computer science core and computer science systems core courses, then apply that knowledge to various advanced topics in upper-division breadth and technical elective courses. Students have opportunities for collaboration on innovative projects and internships as well as the ability to partner with faculty and graduate students on research.

The BSCS program is accredited by the Computing Accreditation Commission of ABET, <https://www.abet.org/>. Our ABET accreditation ensures that every student can confidently call themselves a modern computer scientist. It keeps our educational strategies, lessons, and curriculum up to date and relevant to the rapidly evolving field.

Applying to the BSCS

All GPA and math admissions requirements must be met before applying to the BSCS program. Students must meet one of the following criteria:

- Minimum 3.0 overall GPA with a grade of B- or better in Calculus I OR
- Minimum 2.75 overall GPA AND a 2.5 average in Calculus I and Calculus II (minimum C+ average)

Transfer Students

Students must apply directly through the CU Denver Office of Admissions, <http://www.ucdenver.edu/admissions>. Once accepted, students should start the transfer process for CS and math courses as soon as possible. Please see the section below regarding transfer evaluations.

Current CU Denver students (outside of CEDC)

Students who would like to transfer from another school or college at CU Denver will need to complete [an IUT form](#). The IUT form should be submitted to the Computer Science and Engineering (CSE) Department in the Lawrence Street Center, Ste 800.

Students must apply for admission **prior to completing 45 credits** from beginning CSCI courses. The IUT form must be completed prior to registering for 3000-level CSCI courses.

Current CEDC pre-engineering students

Pre-engineering students must apply for admission to a major using [an IUT form](#) **prior to completing 45 credits** from the time of admittance into pre-engineering.

If a student has retaken Calc I and/or consistently retaken any 1000-2000 level courses more than twice and is unable to make adequate progress toward the admission requirements will be moved to CLAS undeclared and referred to the CU&E center for major exploration.

Current CEDC students in a BA major

Students currently admitted to the College of Engineering, Design and Computing in a bachelor of arts major who would like to change majors to the BSCS degree need to meet with their advisor to discuss the additional requirements.

Students will need to submit a [CSE Change of Major](#) form and complete [an IUT form](#). The change of major request must be completed before the deadlines on the IUT form (Fall semester August 1st, Spring semester December 1st, Summer semester May 1st.)

Current CEDC students in a BS major

Students currently admitted to the College of Engineering, Design and Computing in a bachelor of science major who would like to change majors to the BSCS degree need to meet with a CSE advisor to discuss the degree and an updated anticipated graduation date. Students should then complete a [CEDC Change of Major Form](#).

Advising

Staff Advisors provide academic assistance, promote student success and help the student progress towards educational and career goals. Students should meet with their advisor on a regular basis and come prepared to appointments, ask questions, and take responsibility for actions and decisions that affect academic progress. *Students must familiarize themselves with the program requirements. They are responsible for completing all requirements towards graduation in their respective degree program.*

Prior to the last semester before graduation students must meet with their advisor and complete a graduation plan. This identifies the courses that need to be satisfactorily completed during the final semester of your program. Students must apply for graduation on their portal before census date the semester of graduation.

It is recommended that students get to know CSE faculty well enough that they can serve as references in the future for employment or when applying for an internship or graduate school.

Students can schedule an appointment with their advisor in their [UCDAccess portal](#) or by contacting the CSE department at 303-315-1408.

Transfer Credit Evaluations

Students may request transfer evaluations for courses completed prior to beginning their first semester at CU Denver. Transfer evaluations are only completed for academic coursework. Transfer evaluations will not be completed until an official transcript has been received by CU Denver and the final grade has been posted for the course.

- All transfer credits for math, science, and general education will be evaluated by the Admissions office. If a course is not accepted for equivalency, students may request an evaluation using the [CLAS transfer request form](#).
- Students requesting transfer evaluation for computer science coursework must complete a [CSE transfer request form](#). A syllabus is required for all computer science transfer requests.
- Transfer credit from international universities will only be accepted if the school is ABET accredited. All international coursework will also need credit evaluation through International Admissions.
- The CSE department will not review courses, or approve transfer credit, for coursework students have not completed.
- All Transfer evaluation decisions are final.

CU Denver students taking courses elsewhere

Students must take all their computer science coursework (CSCI prefixes) at CU Denver once admitted to the College of Engineering, Design and Computing.

Students may take courses from outside of CU Denver to meet core course requirements, math, and/or science requirements. Students should meet with their CSE advisor to ensure the course(s) selected will transfer over prior to registration.

Petitions

All CEDC and CS program requirements and policies are strictly enforced. Any deviations from policies must be approved via a CSE department petition. Students should meet with their academic advisor to discuss the petition process and if there is reasonable justification for an exceptional condition for the request. Petitions must be submitted to the CSE department office. Please note that it takes about two weeks to process any petition and may take longer at the beginning or end of the semester.

No petitions are accepted for waiving courses or pre-requisite requirements. Petitions are also not accepted for course registration requests or changes after census date.

Incomplete Grade

An Incomplete grade may be requested when there is a small amount of work left in a course at the end of the semester due to a situation/event beyond the student's control. Students should contact their instructor to request an Incomplete. If the instructor agrees, the student and instructor will work together to draft an Incomplete Agreement.

The Incomplete Agreement should include justification for the Incomplete, current grade in the course, what work is left to complete and expectations for completion, and timeframe for completion. The Incomplete Agreement will then be reviewed by the department. If approved, the agreement is final and the work must be completed according to the agreement expectations and timeframe.

Required cumulative GPA

To remain in good standing with the College of Engineering, Design and Computing, you must maintain at least 2.0 cumulative GPA for all courses and a minimum 2.0 GPA for all courses that are counted as part of the study program.

Laptop Requirement

Undergraduate students in the CSE Department are required to have a personal laptop before starting 3000 level classes. Laptop requirements can be found [here](#).

University and college requirements

These rules of the undergraduate program of the CSE department are complementary to the policies, regulations and requirements of the University of Colorado Denver and the College of Engineering, Design and Computing. The relevant information about these rules and policies is published annually in the University of Colorado Denver catalog, which is available on the CU Denver website www.ucdenver.edu.

Student Code of Conduct

CU Denver strives to make the campus community a place of study, work, and residence where people are treated, and treat one another, with respect and civility.

As members of the CU Denver community, students are expected to uphold university standards that assist in promoting a safe and welcoming community. Every CU Denver student assumes responsibility for knowing and understanding the various local, state, federal, and university laws, policies, and regulations as well as the Student Code of Conduct. [The Student Code of Conduct](#) outlines student rights & responsibilities, behavioral expectations and the university conduct process.

Curriculum for B.S. in Computer Science (CSCI-BS)

All admitted students must follow the curriculum that is in place at the time they are admitted into the computer science program.

Prerequisite requirements are strictly enforced for all computer science (CSCI) courses. Students are responsible for consulting advisors & the class schedule in the student portal for prerequisite information.

3000 and 4000 level courses may only be offered once per year. Students should follow the BSCS [Curriculum Flowchart](#) course rotations to plan 3000 and 4000 level courses.

Students will complete a total of 128 credit hours including:

- 24 credit hours of core curriculum coursework
- 79 credit hours of computer science coursework
- 12 credit hours of mathematics coursework
- 10 credit hours minimum of natural or physical science coursework
- 3 credits of engineering design coursework

CU Denver Core Curriculum

The undergraduate core curriculum consists of 24 credit hours including social sciences, humanities, arts, international perspectives, cultural diversity, behavioral sciences, and intellectual competencies (English 1020 and English 2030). Students should refer to the current [CU Denver catalog](#) for available courses and their prerequisite requirements.

CS Core Courses

Students must complete 25 credit hours of computer science core courses consisting of the following:

- CSCI 1410 Fundamental of Computing
- CSCI 1411 Fundamentals of Computing Lab
- CSCI 2312 Object Oriented Programming
- CSCI 2421 Data Structures & Program Design
- CSCI 2511 Discrete Structures
- CSCI 3287 Database Systems
- CSCI 3412 Algorithms
- CSCI 3508 Introduction to Software Engineering
- CSCI 4034 Theoretical Foundations of Computer Science

CS Systems Core Courses

Students must complete 21 credit hours of computer science core courses consisting of the following:

- CSCI 1510 Logic Design
- CSCI 2525 Assembly Language & Computer Organization
- CSCI 3415 Principles of Programming Languages
- CSCI 3761 Introduction to Computer Networks
- CSCI 3453 Operating Systems Concepts
- CSCI 4551 Parallel & Distributed Computing
- CSCI 4591 Computer Architecture

CS Breadth Electives

Students must complete 21 credit hours in the following breadth areas:

Breadth: Capstone Project (Take 2)

- CSCI 4738 Senior Design I
- CSCI 4739 Senior Design II

Breadth: Data Science (Take 1)

- CSCI 4455 Data Mining
- CSCI 4580 Data Science
- CSCI 4930 Machine Learning
- CSCI 4931 Deep Learning
- CSCI 4702 Big Data Mining
- CSCI 4951 Big Data Systems

Breadth: Scientific Computing (Take 1)

- CSCI 3560 Probability and Computing
- CSCI 4650 Numerical Analysis I
- CSCI 4110 Applied Number Theory
- CSCI 4407 Cryptography & Security
- CSCI 4620 Computational Motor Control

Breadth: Secure Computing (Take 1)

- CSCI 4741 Principles of Cyber Security

- CSCI 4742 Cybersecurity Programming & Analysis
- CSCI 4743 Cyber & Infrastructure Defense

Breadth: System Software (Take 2)

- CSCI 3511 Hardware/Software Interface
- CSCI 4287 Embedded Systems Programming
- CSCI 4565 Introduction to Computer Graphics

CS Technical Electives

Students must complete 12 credit hours (4 courses) chosen from any CSCI 3000 or 4000-level courses that are not part of the required BSCS computer science curriculum.

Students may enroll for up to a total of two graduate courses as CS Technical Electives, from a list of approved courses, with a GPA of 3.3 or higher and instructor approval.

Mathematics

Students must complete a minimum of 12 credit hours of mathematic courses

- MATH 1401 Calculus I
- MATH 2411 Calculus II
- MATH 3195 Linear Algebra & Differential Equations

Students may substitute MATH 3195 with MATH 3191 Linear Algebra and MATH 3200 Differential Equations.

Natural & Physical Sciences

Students must complete a minimum of 10 credit hours of natural & physical science courses with labs. Students must choose between 3 science tracks:

- BIOL 2010 & 2011, 2020 & 2021
- CHEM 2031 & 2038, 2061 & 2068
- PHYS 2311 & 2321, PHYS 2331 & 2341.

Engineering Design

Students must complete ENGR 1200 Fundamentals of Engineering Design Innovation

Sample Academic Plan consistent with the prerequisite requirements

Year One	Semester 1	CRS	Semester 2	CRS
	CSCI 1410 FUNDAMENTALS OF COMPUTING	3	CSCI 2312 OBJECT ORIENTED PROGRAMMING	3
	CSCI 1411 FUNDAMENTALS OF COMPUTING	1	CSCI 2511 DISCRETE STRUCTURES	3
	MATH 1401 CALCULUS I	4	CSCI 1510 LOGIC DESIGN	3
	ENGR 1200 FUND OF ENGINEERING DESIGN	3	CORE CURRICULUM ELECTIVE	3
	CORE CURRICULUM ELECTIVE	3	ENGL 2030 CORE COMPOSITION II	3
	ENGL 1020 CORE COMPOSITION I	3		
Year Two	Semester 3	CRS	Semester 4	CRS
	CSCI 2421 DATA STRUCTURES & PROGRAM	3	CSCI 3287 DATABASE SYSTEMS	3
	CSCI 2525 ASSEMBLY LANGUAGE &	3	CSCI 3412 ALGORITHMS	3
	MATH 2411 CALCULUS II	4	MATH 3195 LINEAR ALGEBRA/DIFF	4
	CORE CURRICULUM ELECTIVE	3	CORE CURRICULUM ELECTIVE	3
	CORE CURRICULUM ELECTIVE	3	CORE CURRICULUM ELECTIVE	3

Year Three	Semester 5	CRS
	CSCI 3508 SOFTWARE ENGINEERING	3
	CSCI 3761 INTRODUCTION TO COMPUTER	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	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 BREADTH	3
CS TECHNICAL ELECTIVE	3

Dual BS / MS Program: CS Scholars

Current full-time Bachelor of Science in Computer Science Students wishing to continue to a Master of Science in Computer Science have an additional option to combine both efforts.

Admission to the Computer Science Scholars program allows the student to take up to four 5000- level MS courses counting as both electives for their BS and towards their MS degree. Students must apply for the CS Scholars Program before their last year of courses to receive dual credit for 5000 level courses:

- If accepted, students remain in an Undergraduate status until receiving the BS degree, then move into a Graduate status with an intent of completing the MS in Computer Science within a year.
- Students can take up to four graduate courses while in an Undergraduate status.
- Students must meet with a CS Graduate advisor within a semester of acceptance into the CS Scholars Program.

In order to apply for the CS Scholars Program, students must:

- Complete at least 60 credits toward the BS degree;
- Complete the following three courses: CSCI: 3412: Algorithms, CSCI 3453: Operating Systems Concepts, and CSCI 3287: Database Systems;
- Have a minimum cumulative GPA of 3.3 or a 3.5 GPA in CS major coursework.

Students must complete a [Computer Science Scholars Program Application](#), which can be picked up from the Computer Science Department, Lawrence 800. Students should meet with their advisor to discuss possible courses and submit the application. Students may submit an application in the semester that they will meet the requirements, but final decisions will be pending final semester grades.

The Computer Science Graduate committee will review the application, and notify the students of their decision. All graduate program rules apply to graduate courses, including a requirement for a B- or better to count toward the MS degree.