



University of Colorado Denver

## Department of Computer Science and Engineering

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

*These degree requirements are in effect starting from 2016-17 Admission.*

### Applying to the College of Engineering and Applied Science:

If you're a new student interested in our bachelor's degree program, you must apply directly through the [CU Denver Office of Admissions](http://www.ucdenver.edu/admissions), <http://www.ucdenver.edu/admissions>.

If you're a pre-engineering student who is already admitted to CU Denver, apply directly to the College of Engineering and Applied Science by submitting an intra-university transfer (IUT) application and a copy of your [CU Denver transcript](#) to North Classroom, Room 2615.

The IUT application can be picked up from the Academic Success and Advising Center in Student Commons 1113, or from the Office of Engineering Student Services in North Classroom, Room 2615.

Refer to the BS-CS Handbook for complete advising and degree requirements.

**If you have been admitted in Pre-engineering**, contact the Academic Success and Advising Center, for an appointment and initial advising at 303-315-1940.

**If you've been admitted into the College of Engineering and Applied Science**, you must meet with a Computer Science advisor. Call the Computer Science and Engineering Office for an appointment at 303-315-1411 or 303-315-1408.

### Curriculum

All newly admitted students are obligated to follow the curriculum that is in place at the time they are admitted into the College of Engineering and Applied Science. Under some conditions, it is possible to switch to the requirements of a new curriculum if the revision(s) occurred after your admittance.

Prerequisite requirements are strictly enforced for all computer science (CSCI) courses.

## Faculty Advisor

Regular visits with your faculty advisor are mandatory and help to verify satisfactory progress toward the BS in CS degree. Students are assigned a faculty advisor and must meet with their advisor every semester in order to enroll for the upcoming semester. It is advised that students get to know additional faculty well enough that they can serve as references in the future for employment or when applying to a graduate school.

## 30-Hour Senior Checkout

After completing approximately 100 semester hours toward the BS CS degree, you must request a 30-hour senior checkout. You must have no more than 35 credit hours remaining to graduate before requesting the 30-hour senior checkout.

During this checkout, the courses that you still need to complete are identified. The study program sheet serves as a record of a 30-hour senior checkout. Call the Department of Computer Science and Engineering Office for an appointment.

## Graduation Plan

Prior to the last semester before graduation you must meet with your advisor and complete a graduation plan. This identifies the courses that need to be satisfactorily completed during the final semester of your program.

## CU Denver students taking courses elsewhere

If you're admitted to the College of Engineering and Applied Science and wish to take courses outside UC Denver to meet graduation requirements, you must obtain prior departmental approval via an approved petition. If approved, the credit hours earned are included in your program via requests for formal transfer advising.

- **Formal transfer advising** can be done only after the UC Denver Office of Admissions has issued an Applicant Transfer Credit Evaluation and you have been admitted to the College of Engineering and Applied Science.
- If you wish to receive **transfer advising for credits related to the computer science curriculum**, call the CSE office to make an appointment with an advisor. Please bring any course syllabus and course descriptions for evaluation.
- If you are a pre-engineering student intending to transfer and major in CS, you must meet with an advisor in the Student Academic Success Office. All your non-CS transfer credits for science, general education, and Math will be evaluated in that office.

## Petitions

Any deviations from the published curriculum must be approved before taking the alternate course or taking courses concurrently that are normally taken in sequence. Approval is obtained via an approved CS department petition. Petitions requesting a curricular deviation must be submitted to

the CSE department office. Please note that it takes about two weeks to process any petition, especially at the beginning of the semester.

## **Drop policy**

If you wish to drop a class after the official deadline, you must file a petition with an attached and signed drop/add form. However, no student may drop a class within two-weeks prior to the end of the semester.

## **Required cumulative GPA**

To remain in good standing with the College of Engineering and Applied Science you must maintain at least 2.0 cumulative GPA for all courses.

## **Required study-program GPA**

To graduate with a degree from the College of Engineering and Applied Science you must have at least 2.0 GPA for all courses that are counted as part of the study program.

## **Required departmental GPA**

To graduate with a degree from the CSE department you must have at least 2.0 GPA for all CS courses attempted.

## **Students Planning to Continue to Master of Science in Computer Science at UCD**

Students that are performing above average (3.5 GPA) and have completed all junior level required courses may take two 5000-level MS courses with the instructor permission and have them count as both electives for their BS and towards their MS degree. In order to do this the student must have a faculty sponsor.

## **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.

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 only 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:

- a) Complete at least 60 credits toward the BS degree;
- b) Complete the following three courses: CSCI: 3412: Algorithms, CSCI 3453: Operating Systems Concepts, and CSCI 3287: Database Systems;
- c) 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 802. Students should meet with their advisor to discuss possible courses and submit the application. Students may submit an application in the semester that they 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.

## **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 and Applied Science. The relevant information about these rules and policies is published annually in the University of Colorado Denver catalog, which is available on the UCD website [www.ucdenver.edu](http://www.ucdenver.edu).

## Curriculum for B.S. in Computer Science (CSCI)

The required minimum number of hours is 128. The student must satisfactorily complete all the course work in the curriculum shown below, satisfy all the graduation requirements, and maintain at least a 2.0 grade-point average in all courses. The courses below are listed together with their prerequisites. Prerequisite courses must be completed with a letter grade of C- or better.

### REQUIRED COMPUTER SCIENCE COURSES (52 SEMESTER HOURS)

CSCI 1410-3 Fundamentals of Computing	Pre = Freshman status, Co = CSC 1411
CSCI 1411-1 Fundamentals of Computing Lab	Pre = Freshman status, Co = CSC 1410
CSCI 1510-3 Logic Design	Pre = Freshman status: MATH 1120 or 1130 or equivalent
CSCI 2312-3 Object Oriented Programming	Pre = CSCI 1410, Co = CSCI 2421
CSCI 2421-3 Data Structures & Program Design	Pre = CSCI 1410, Co = CSCI 2312
CSCI 2525-3 Assembly Language & Computer Organization	Pre = CSCI 1410 & 1510
CSCI 3287-3 Database Systems	Pre = CSCI 2421
CSCI 3412-3 Algorithms	Pre = CSCI 2421 & 2511
CSCI 3415-3 Principles of Programming Languages	Pre = CSCI 2421 & 2525
CSCI 3453-3 Operating Systems Concepts	Pre = CSCI 3412 & 2525
CSCI 3508-3 Introduction to Software Engineering	Pre = CSCI 3412
CSCI 3511-3 Hardware/Software Interface	Pre = CSCI 2525
CSCI 4034-3 Theoretical Foundations of Computer Science	Pre = CSCI 3412
CSCI 4591-3 Computer Architecture	Pre = CSCI 2525
CSCI 4287-3 Embedded Systems Programming	Pre = CSCI 3453
CSCI 4738-3 Senior Design Project I	Pre = CSCI 3287, CSCI 3415, CSCI 3453, CSCI 3508
CSCI 4739-3 Senior Design Project II	Pre = CSCI 4738
CSCI 4761-3 Introduction to Computer Networks	Pre = CSCI 2421

### COMPUTER SCIENCE TECHNICAL ELECTIVES (21 SEMESTER HOURS)

Students must take seven courses (21 semester hours) chosen from any CSCI 3000 or 4000-level courses that are not part of the required bachelor of science in computer science (BSCS) curriculum. Exception: up to two of the following may be taken to satisfy computer science: CSCI 2930, CSCI 2940, CSCI 2941, CSCI 2942.

### MATHEMATICS (21 SEMESTER HOURS)

MATH 1401-4 Calculus I	Pre = (MATH 1120 or 1130) and placement exam
MATH 2411-4 Calculus II	Pre = MATH 1401
MATH 3195-4 Linear Algebra and Differential Equations	Pre = MATH 2411
CSCI 2511-3 Discrete Structures	Pre = MATH 1401
CSCI 3560-3 Probability and Computing	Pre = MATH 2411 & CSCI 2511
CSCI 4650-3 Numerical Analysis I	Pre = MATH 2411, MATH 3191 or MATH 3195

### SCIENCE (10 SEMESTER HOURS)

PHYS 2311-4 General Physics I: Calculus-based	Pre = MATH 1401
PHYS 2321-1 General Physics lab I	Co = PHYS 2311
PHYS 2331-4 General Physics II: Calculus-based	Pre = PHYS 2311 & MATH 2411
PHYS 2341-1 General Physics lab II	Pre = PHYS 2321; Co = PHYS 2331

### UNDERGRADUATE CORE CURRICULUM IN ENGINEERING: SOCIAL SCIENCES, HUMANITIES, ARTS, ETC. (24 SEMESTER HOURS)

The undergraduate core curriculum for engineering includes: social sciences 3 hrs, humanities 3 hrs, arts 3 hrs, international perspectives 3 hrs, cultural diversity 3 hrs, behavioral sciences 3 hrs, and intellectual competencies (English 1020 and English 2030), for a total of 24 hours. Refer to the current UC-Denver catalog for available courses and their prerequisite requirements.

## Sample Academic Plan consistent with the prerequisite requirements

### FIRST YEAR

fall semester			spring semester		
class	hrs		class	hrs	
<b>CSCI 1410</b> FUNDAMENTALS OF COMPUTING	3		<b>CSCI 2312</b> OBJECT ORIENTED PROGRAMMING	3	
<b>CSCI 1411</b> FUNDAMENTALS OF COMP. LAB	1		<b>CSCI 2421</b> DATA STRUCTURES & PROG . DES.	3	
<b>CSCI 1510</b> LOGIC DESIGN	3		<b>MATH 2411</b> CALCULUS II	4	
<b>MATH 1401</b> CALCULUS I	4		<b>PHYS 2311</b> GENERAL PHYSICS I	4	
<b>ENGL 1020</b> CORE COMPOSITION I	3		<b>PHYS 2321</b> GENERAL PHYSICS LAB I	1	
<b>CORE CURRICULUM ELECTIVE</b>	3				
<b>TOTAL</b>	<b>17</b>		<b>TOTAL</b>	<b>15</b>	

### SECOND YEAR

fall semester			spring semester		
class	hrs		class	hrs	
<b>CSCI 2525</b> ASSEMBLY LANG. & COMP. ORG.	3		<b>CS ELECTIVE</b>	3	
<b>CSCI 2511</b> DISCRETE STRUCTURES	3		<b>CSCI 3287</b> DATABASE SYSTEMS	3	
<b>PHYS 2331</b> GENERAL PHYSICS II	4		<b>CS ELECTIVE</b>	3	
<b>PHYS 2341</b> GENERAL PHYSICS LAB II	1		<b>CSCI 3412</b> ALGORITHMS	3	
<b>ENGL 2030</b> CORE COMPOSITION II	3		<b>CORE CURRICULUM ELECTIVE</b>	3	
<b>CORE CURRICULUM ELECTIVE</b>	3				
<b>TOTAL</b>	<b>17</b>		<b>TOTAL</b>	<b>15</b>	

### THIRD YEAR

fall semester			spring semester		
class	hrs		class	hrs	
<b>CSCI 3415</b> PRIN PROGRAMMING LANG	3		<b>CSCI 3508</b> SOFTWARE ENGINEERING	3	
<b>CSCI 3453</b> OPERATING SYSTEMS	3		<b>CSCI 4287</b> EMBEDDED SYSTEMS PROG	3	
<b>CSCI 3511</b> HARDWARE-SOFTWARE INTERF.	3		<b>CS ELECTIVE</b>	3	
<b>CSCI 3560</b> PROBABILITY AND COMPUTING	3		<b>MATH 3195</b> LINEAR ALGEBRA/DIFF EQU	4	
<b>CS ELECTIVE</b>	3		<b>CORE CURRICULUM ELECTIVE</b>	3	
<b>CORE CURRICULUM ELECTIVE</b>	3				
<b>TOTAL</b>	<b>18</b>		<b>TOTAL</b>	<b>16</b>	

### FOURTH YEAR

fall semester			spring semester		
class	hrs		class	hrs	
<b>CSCI 4034</b> THEORETICAL FOUND OF CS	3		<b>CSCI 4591</b> COMPUTER ARCHITECTURE	3	
<b>CS ELECTIVE</b>	3		<b>CSCI 4739</b> SENIOR DESIGN PROJECT II	3	
<b>CSCI 4650</b> NUMERICAL ANALYSIS I	3		<b>CSCI 4761</b> INTRO TO COMPUTER NETW	3	
<b>CSCI 4738</b> SENIOR DESIGN PROJECT I	3		<b>CS ELECTIVE</b>	3	
<b>CS ELECTIVE</b>	3		<b>CORE CURRICULUM ELECTIVE</b>	3	
<b>TOTAL</b>	<b>15</b>		<b>TOTAL</b>	<b>15</b>	

Students must take seven courses (21 semester hours) chosen from any CSCI 3000 or 4000-level courses that are not part of the required bachelor of science in the computer science (BSCS) curriculum. The 2000-level CSCI 2930 "Practical Systems Administration" course will be counted as one CSCI elective.

**CORE CURRICULUM ELECTIVE** is to be selected from the undergraduate General Education core.

*ENGL 1020 and ENGL 2030 are the only approved composition courses for the UC Denver Core Curriculum. ENGL 1020 should be taken the first semester a student is enrolled at UC Denver.*