

MASTER'S DEGREE PROGRAM IN

Computer Science

College of Engineering
University of Colorado Denver

The Department of Computer Science and Engineering offers a Master of Science degree in Computer Science.

Research areas of emphasis include: algorithms, automata theory, artificial intelligence, communication networks, combinatorial geometry, computational geometry, computer graphics, distributed computing, graph theory, information theory, internet, parallel processing, simulation, and software engineering.

Admission Requirements

Applicants should hold a bachelor's degree from an institution comparable to the University of Colorado. They need to have sufficient programming experience and mathematical maturity to understand advanced courses.

Prerequisites

Applicants should have had the equivalent of the following University of Colorado courses:

CSC 1410-3 Fundamentals of Computing
CSC 2421-3 Data Structures and Program Design
CSC 2511-3 Discrete Structures

In addition, applicants should have had at least three upper-division computer science courses, such as the following courses:

CSC 3412-3 Algorithms
CSC 3415-3 Principles of Programming Languages
CSC 3453-3 Operating System Concepts
CSC 4034-3 Theoretical Foundations of Computer Science
CSC 4508-3 Introduction to Software Engineering
CSC 4591-3 Computer Architecture

Additional requirements include:

- (1) 10 credit hours, on the semester basis, of university- level Calculus; and
- (2) at least one math course beyond Calculus, such as Advanced Calculus, Differential Equations, Linear Algebra, Probability, Statistics, or Combinatorial Analysis.

Students lacking some of these courses, whose background is otherwise satisfactory, might be admitted with the understanding that the courses would have to be completed after admission.

Required GPA

Applicants should have a grade point average (GPA) of at least 2.75. If the GPA is below 2.75 but above 2.50, and/or some prerequisites are lacking, applicants may be accepted as "provisional degree students."

GRE Exam

Applicants whose GPA is below 2.75 must submit GRE results of 1000 Verbal + Math, and 3.0 Written. The other option is to take four CSE undergraduate courses in computer science, to be taken at UCD, as a non-degree student and receive at least a B in all of them; the student must contact CSE Graduate Advisor to learn which courses are applicable.

TOEFL Exam

International students must take TOEFL English proficiency exam and score at least 500 on the paper based exam, 173 on the computer based exam (CBT), or 61 on the Internet based exam (IBT).

Transfer Credit

A maximum of nine semester hours of graduate course work may be transferred into the program based on department approval. In principle, core courses must be taken from the CSE department at UCD.

Notes:

- Candidates applying for the MS study will be evaluated by the Department's Graduate Committee using the above specified rules and requirements.
- A letter with a decision will be sent to the applicant by the CSE Chair.

MS in Computer Science Degree Requirements

Master's degree candidates are required to complete a program of study consisting of at least 30 semester hours of graduate level computer science courses while maintaining a grade point average of at least 3.0. Graduate school rules do not allow grades of C- or lower to be applied to the completion of the graduate program. With prior approval by the Graduate Committee a student may substitute up to nine semester hours by graduate mathematics or other engineering courses.

Students need to submit an approved Plan of Study to the Department during the first semester of their admission. An academic advisor will consult students to develop a Plan of Study.

Students may choose either **Plan I** (thesis) or **Plan II** (MS project), and both require successful defense.

Plan I – Thesis:

Students take 24 hours of graduate course work, and additionally write and defend a thesis, which counts for 6 hours of graduate thesis work.

Plan II – MS Project:

Students take 27 hours of graduate course work, and additionally write and defend a MS project report, which counts for 3 hours of graduate MS project work.

Students are allowed a maximum of 3 credit hours of CS Independent Study.

Students may only take graduate Engineering or graduate Mathematics courses that are offered towards an MS degree in a degree granting department, while at least 21 hours must be CS. It is advisable that students get prior approval of a graduate CS advisor before taking any course that does not have a C SC prefix. For example, courses offered through Continuing Education are not counted toward an MS degree in Computer Science.

The only exception for a student to take a graduate course from any other department is when the course satisfies all of the following conditions:

1. It appears in a graduate program.
2. It is taken instead of 3 hours of CS Independent Study.
3. It is approved by the CS Graduate Committee.

No more than 6 hours may be in the form of on-line courses.

Notes:

- A student will need to choose a CSE full time faculty member with a graduate faculty appointment as a permanent Thesis/MS Project Advisor. The Thesis/MS Project Advisor will chair the Thesis/MS Project Committee. The Thesis/MS Project Committee will consist of at least three members, two of whom must be CSE graduate faculty members.
- Thesis/MS Project and Independent Study supervision:
 1. Tenured/tenure-track CSE faculty who are members of UCD Graduate School may supervise thesis, MS Project, and graduate independent studies.
 2. Tenured/tenure-track faculty from outside of CSE department may co-advise MS thesis, MS Project, and graduate independent studies, along with the approval of the designated CSE faculty advisor.
 3. Part-time CSE faculty, e.g., lecturers, honoraria, graduate students, may not supervise thesis and MS Project. They may, however, serve as informal supervisors of graduate independent studies, sponsored by a full-time tenured/tenure-track CSE faculty who is a member of the UCD Graduate School faculty serves as the supervisor- of-record.
- Students in thesis plan have priority in obtaining departmental assistantships.

CSE Graduate Course Areas in Computer Science

MS students will take graduate CS courses in three categories.

Only courses passed with at least a B are counted towards satisfying the mandatory requirement of at least three courses in the “core” category.

Category A ("core")

Take at least three of the following five courses:

CSC 5446 Theory of Automata
CSC 5451 Algorithms
CSC 5582 Artificial Intelligence
CSC 5593 Advanced Computer Architectures
CSC 5573 Operating Systems (Prerequisite: CSC 3412 & CSC 3415) **or**
CSC 5574 Advanced Topics in Operating Systems (Prerequisite: CSC3453 or CSC 5573)
Note students may take and apply only one of CSC 5573 or CSC5574 toward satisfying
Category A. The second operating systems course may be applied toward satisfying Category B.

Courses taken in this category, in excess of the required three, may be counted in category below.

Category B ("breadth")

Take at least three additional graduate CS courses, taught by regular full-time CSE faculty members.
The courses available may vary from semester to semester, but currently will be a subset of:

CSC 5217 Information Theory
CSC 5257 Data Compression
CSC 5408 Applied Graph Theory
CSC 5409 Graph Theory and Algorithms
CSC 5494 Cellular Automata and Complexity
CSC 5551 Parallel and Distributed Systems
CSC 5552 Advanced Topics in Parallel Processing
CSC 5565 Introduction to Computer Graphics
CSC 5585 Advanced Computer Graphics
CSC 5559 Databases
CSC 5619 Complex Intelligent Systems
CSC 5630 Linguistic Geometry
CSC 5640 Universal Compiler: Theory and Construction
CSC 5690 Knowledge Representation for Intelligent Systems
CSC 5728 Software Engineering
CSC 5761 Introduction to Computer Networks
CSC 5780 Theory of Distributed Computing
CSC 5799 High Performance Network-Based Computing
CSC 58xx Special Topics Courses (taught by full-time CSE graduate faculty)
CSC 7002 Computer Security
CSC 7654 Algorithms for Communication Networks

Note that courses taught by other than regular full-time CSE faculty, possibly including some courses listed here, are explicitly excluded from this category but may fall in category C below.

Category C

- Students must select either MS thesis (6 credit hours maximum) or MS project (3 credit hours maximum).
- Graduate Independent study is optional and allows up to 3 credit hours maximum.

Remaining courses may be any other graduate courses consistent with CSE, College of Engineering, and Graduate School rules. Examples include, but are not limited to:

- CSC 6950 MS Thesis, CSC 6960 MS Project, CSC 6840 Independent study, and appropriate graduate Mathematics and Engineering courses.

Students' Responsibilities and Steps to Follow:

Failure to follow these steps may prolong or stop your graduation. All students are responsible to adhere to the Academic Calendar, and Graduate School dates and deadlines published every semester.

1. All new students must attend an orientation that is held 11:00 to 1:00 Thursday of the week before start of every semester
2. New students must prepare a plan of study and receive approval from an advisor, within the first month of their first semester. Forms will be available on the CSE web-site.
3. Students must receive a graduate advisor's approval for any change to their initial plan of study.
4. **Graduation check** (required for all students intending to graduate):
 - a. Students must submit a Diploma Card online.
 - b. Students apply for admission to candidacy by completing the required forms. The form is on-line located on the Computer Science web-site. The form must be completed at the beginning of the semester the student intends to graduate (deadlines are published by the Graduate School every semester). Students must make an appointment and meet with a graduate advisor to have their application for candidacy approved.

For answers to frequently asked questions, please refer to:

<http://carbon.cudenver.edu/~galagha/GradFAQs.html>

Adequate Progress toward MS in Computer Science Degree

- Students are expected to finish the MS degree program within 5 years. Candidates for the MS degree may not get credit for a course taken longer than five years before the date on which the degree is to be granted.
- Students who do not enroll for any course work in the graduate program in a Fall or Spring semester need to notify the Computer Science and Engineering Department in writing. Students who are not enrolled for three consecutive Fall or Spring semesters might be removed from the program

Contact Information

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Petitions are submitted online and then need to be printed and signed in the Department's Office. Advising may be scheduled either online or directly through the Department's Office.

Faculty

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