MASTER's DEGREE PROGRAM IN

Computer Science

**College of Engineering
University of Colorado Denver**

These degree requirements are in effect starting from 2013-2014 Admission.

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, mobile computing, pervasive and mobile systems, 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.
Qualified applicants holding a degree outside Computer Science, Computer Engineering or equivalent fields may need to take additional undergraduate courses before starting the graduate program.

Admission decisions are based on prior academic performance, letters of recommendation, English proficiency if applicable, as well as the applicant's written statement of purpose.

Additional requirements include:
(1) University- level Calculus I and Calculus II (equivalent to two semesters); 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 requirements, whose background is otherwise satisfactory, might be admitted with the understanding that the certain undergraduate courses have to be completed after admission.

Grade Point Average (GPA):

Applicants are expected to have grade point average (GPA) of at least 3.0.

International Students:

Applicants whose native language is not English must take either the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exam and must score above 525 (paper) or 197 (computer) or 71 (internet based) or 6.0 on the IELTS. Applicants whose native language is not English are not required to take the TOEFL test if they have completed a baccalaureate or graduate-level degree program at an English-speaking college or university or have completed at least 2

semesters at a college or university in the United States as a full-time student and obtained a "B" average (3.0 GPA) or higher.

Admission Decision:

Candidates applying for the MS study will be individually evaluated by the Department's Graduate Committee. A letter with a decision will be sent to the applicant by the CSE Chair.

Provisional Admission:

Applicants may be accepted as "provisional degree students." This status is indicated in the acceptance letter along with the conditions that need to be satisfied by a specified deadline in order for the student to obtain regular status.

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. According to the Graduate school rules graduate courses with grades below B- cannot be applied toward the completion of the graduate degree. 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 **Plan I** (thesis), **Plan II** (MS project), or **Plan III** (Course only). Both Plan I and II require successful defense of thesis or project in student's graduating semester.

> **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.
>
> **Plan III – Course Only:**
> Students take 30 hours of graduate course work consisting of a minimum of 4 out of 5 Category A courses, and 4 Category B courses. Independent study course will not be counted toward graduation in this course only option. In the final semester, graduating students must submit a final written research report on a subject specified by a CSE Faculty Committee.

Students are allowed a maximum of 3 credit hours of CS Independent Study (except in Plan III, course only option).

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 CSCI 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, who is in **Plan I** (thesis), and **Plan II** (MS project), 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 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.

Category A ("core")

Take at least three of the following five courses:

CSCI 5446 Theory of Automata
CSCI 5451 Algorithms
CSCI 5582/CSCI 7582 Artificial Intelligence
CSCI 5593 Advanced Computer Architectures
CSCI 5573 Operating Systems

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:

        CSCI 5408 Applied Graph Theory
        CSCI 5409 Graph Theory and Algorithms
        CSCI 5411 Computational Geometry
        CSCI 5551 Parallel and Distributed Systems
        CSCI 5552 Advanced Topics in Parallel Processing
        CSCI 5565 Introduction to Computer Graphics
        CSCI 5574 Advanced Topics in Operating Systems
        CSCI 5585 Advanced Computer Graphics
        CSCI 5595 Computer Animation
        CSCI 5619 Complex Intelligent Systems
        CSCI 5630 Linguistic Geometry
        CSCI 5640 Universal Compiler: Theory and Construction
        CSCI 5690 Knowledge Representation for Intelligent Systems
        CSCI 5765 Computer Networks
        CSCI 5780 Theory of Distributed Computing
        CSCI 5799 Topics in Networked Computing
        CSCI 58xx Special Topics Courses (taught by full-time CSE graduate faculty)
        CSCI 7002 Computer Security
        CSCI 7551 Parallel and Distributed Systems
        CSCI 7552 Advanced Topics in Parallel Processing
        CSCI 7574 Advanced Topics in Operating Systems
        CSCI 7582 Artificial Intelligence
        CSCI 7595 Computer Animation
        CSCI 7654 Algorithms for Communication Networks
        CSCI 7765 Computer Networks
        CSCI 7799 Topics in Networked Computing

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

- A Student in **Plan I** (thesis), and **Plan II** (MS project) 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:

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

Transfer of 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.

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 the 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://cse.ucdenver.edu/~gita/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:

Please contact Ms. Sarah Mandos the CSE Department program assistant for information, appointments, and inquiries:

Mailing Address:
Department of Computer Science and Engineering
Campus Box 109
PO Box 173364
Denver, CO 80217 - 3364

Location:	Lawrence Street Center 8th floor
Telephone:	(303) 315-1408
Fax :	(303) 315-1410
Email:	**ComputerScience@ucdenver.edu**

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

Alaghband, Gita
Ph.D. University of Colorado Boulder
Research areas: parallel and distributed systems, operating systems, computer architecture, simulation
Gita.Alaghband@ucdenver.edu

Altman, Tom
Ph.D. University of Pittsburgh
Research areas: theory, algorithms
Tom.Altman@ucdenver.edu

Chlebus, Bogdan
Ph.D. University of Warsaw, Poland
Research areas: algorithms, distributed computing, communication in networks
Bogdan.Chlebus@ucdenver.edu

Choi, Min-Hyung
Ph.D. University of Iowa
Research areas: computer graphics, virtual reality, human computer interaction
Min.Choi@ucdenver.edu

Gethner, Ellen
Ph.D. University of British Columbia (Computer Science)
Ph.D. Ohio State University (Mathematics)
Research areas: graph theory and graph algorithms, combinatorial, discrete, and computational geometry, discrete mathematics, number theory
Ellen.Gethner@ucdenver.edu

Lewis, Jason
> Ph.D. Clemson University
> Research areas: computer forensics
> jason.r.lewis@ucdenver.edu

Ra, Ilkyeun
> Ph.D. Syracuse University
> Research areas: high performance distributed computing and computer communication network.
> Ilkyeun.Ra@ucdenver.edu

Stilman, Boris
> Ph.D. National Research Institute for Electrical Engineering, Moscow, USSR
> Research areas: artificial intelligence, linguistic geometry
> Boris.Stilman@ucdenver.edu

Trobaugh, Will, Senior Instructor
> MS University of Colorado Denver
> Will.Trobaugh@ucdenver.edu

Vu, Tam
> Ph.D. Rutgers University
> Research areas: mobile computing, pervasive and mobile systems
> Tam.Vu@ucdenver.edu