Computer Science & Engineering
Graduate Programs

RESEARCH AREAS

Algorithms
Animation
Big data management & mining
Bioinformatics
Cloud computing
Cognitive battery management
Computer architecture
Computer graphics
Computer networks
Cyber-physical systems
Cybersecurity and defense
Data science
Database systems
Distributed computing
Graph theory
High-performance computing
Human-centric computing
Machine learning
Mobile computing
Mobile healthcare
Operating systems
Parallel processing
Science of security
Simulation
Software engineering
Visualization
Wearable computing

The Department of Computer Science and Engineering at CU Denver offers three graduate degrees: the Master of Science in computer science, a PhD in computer science and information systems and a PhD in engineering and applied science. The department maintains modern research laboratories in the areas of parallel and distributed systems, computer graphics, computer networkings, cyber and infrastructure defense, cyber physical systems, machine learning, mobile and pervasive sensing and big data.

Master of Science

The Master of Science in computer science prepares students for creative work in computer science, including the areas of software and computer engineering, the interrelationship of hardware and software, and the theory and practice of good software design methodologies.

Applicants should hold a bachelor's degree with a minimum GPA of 3.0 and 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, and a written statement of purpose.

Additional requirements include university-level Calculus I and Calculus II (equivalent to two semesters) and at least one math course beyond Calculus.

Transfer Credit

A maximum of 9 semester hours of graduate coursework may be transferred into the program, based on department approval.

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University of Colorado **Denver**

DEGREE REQUIREMENTS

Master's degree candidates are required to complete a minimum of 30 semester hours of graduate-level computer science courses (depending on track) while maintaining a grade point average of at least 3.0. All students are required to complete algorithms, operating systems, theory of automata, and computer architecture. Students choose from three plans of study:

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 and complete a final MS course project based on their interest and approved list of courses during their graduating semester.

Certificate Programs

The Department of Computer Sicence and Engineering offers graduate certificates in **Cyber Security and Defense** and

Software Engineering. Visit **ucdenver.edu/cse** for more information.

CSIS PhD Program

The computer science and information systems (CSIS) PhD at CU Denver is an interdisciplinary program between the College of Engineering, Design and Computing and the CU Denver Business School designed to support innovative and interdisciplinary computing research across all disciplines impacting engineering, sciences, business and health. The program covers a broad spectrum of core fundamentals as well as applied aspects including those of interdisciplinary nature. Students in the program conduct research on real-world technological problems of the modern society.

GENERAL REQUIREMENTS

Hours needed for the PhD program are 30 hours of CSIS courses and 30 hours of dissertation work. The course work provides exposure to advanced CSIS areas, as well as a solid research methodology background and breadth in other areas of CSIS. Students may transfer up to 21 hours to satisfy course requirements based on the recommendation of their PhD advisor and with the consent of the program director.

PROGRAM COMPONENTS

Preliminary Exam:
Each student must select and pass an exam in three of four possible subject areas: Algorithms, Architecture, Computational Theory, and Operating Systems.

Comprehensive Exam
Students will submit a written paper and complete an oral presentation to fulfill the comprehensive exam requirement. The Comprehensive Exam is intended to test student's capability to complete, with guidance, key research in computer science.

Dissertation
Following the approval of the dissertation proposal, a student submits a dissertation. The dissertation is defended in front of the doctoral committee in a public meeting.

Engineering and Applied Science PhD

Computer Science and Engineering is a host department for the interdisciplinary Engineering and Applied Science PhD. Learn more about the EAS PhD, the department, faculty and research at **ucdenver.edu/cse** and select Graduate Programs.

Big Data Science & Engineering

We offer a complete pipeline of core data science and engineering courses at the undergraduate and graduate level that cover a variety of topics including database systems, data mining, data science, parallel data processing, data storage systems, etc. This is complemented by existing scholarship and fellowship opportunities focused on the same topic. These opportunities further expose students to the domain disciplines of data science— health care, geospatial science, business intelligence, and medical science—so that our graduates enter the job market with applicable and interdisciplinary data science and engineering skills.

MS Track: Data Science in Biomedicine

This track requires a minimum of 36 semester hours of graduate-level courses and is available for students who choose Plan I – Thesis. With this track, students will adopt biomedical applications of data science to learn data science methodologies and technologies. VIsit our website for more information.

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