Duluth Campus

Computer Science M.S.

Computer Science

Swenson College of Science and Engineering

Link to a list of faculty for this program.

Contact Information:
Department of Computer Science, University of Minnesota Duluth, 1114 Kirby Drive, 320 Heller Hall, Duluth, MN 55812 (218-726-7607; fax: 218-726-8240)
Email: cs@d.umn.edu
Website: http://www.d.umn.edu/cs/degrees/grad/

- Program Type: Master's
- Requirements for this program are current for Fall 2021
- Length of program in credits: 30 to 32
- This program does not require summer semesters for timely completion.
- Degree: Master of Science

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

Computer science is a discipline that involves understanding the design of computers and computational processes. Study in the field ranges from the theoretical study of algorithms to the design and implementation of software at the systems and applications levels.

The master of science is a two-year program that provides the necessary foundational studies for graduates planning to pursue either a doctorate in computer science or a career as a computer scientist in business or industry. It is designed for students with undergraduate degrees in computer science or a related field. These students should be able to enroll immediately in 5xxx or 8xxx computer science courses.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission

The preferred undergraduate GPA for admittance to the program is 3.00.

The program is designed for students with undergraduate degrees in computer science or a related field.

Other requirements to be completed before admission:
Students with undergraduate degrees in fields other than computer science or related areas may be considered for admittance if they have completed the following courses or their equivalents: CS 1511-1521 - Computer Science I-II; CS 2511 - Software Analysis and Design; CS 2521 - Computer Organization and Architecture; MATH 3355 - Discrete Mathematics or CS 2531 - Discrete Structures for Computer Science' CS 3531 Automata & Formal Languages; and at least three of CS 4312 - Operating Systems, CS 4332 - Computer Security, CS 4422 - Computer Networks, CS 4122 - Advanced Data Structures and Algorithms, CS 4212 - Computer Graphics, CS 4322 - Database Management Systems. The appropriate math prerequisites, namely MATH 1296 - Calculus I and STAT 3611 - Introduction to Probability and Statistics, are also required.

Applicants must submit their test score(s) from the following:

- GRE

International applicants must submit score(s) from one of the following tests:

- TOEFL
  - Internet Based - Total Score: 79
  - Internet Based - Writing Score: 21
  - Internet Based - Reading Score: 19
- IELTS
  - Total Score: 6.5
- MELAB
  - Final score: 80

The preferred English language test is Test of English as Foreign Language

Key to test abbreviations(GRE, TOEFL, IELTS, MELAB).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements

Plan A: Plan A requires 14 to 20 major credits, 0 to 6 credits outside the major, and 10 thesis credits.The final exam is oral.

Plan B: Plan B requires 18 to 32 major credits and 0 to 8 credits outside the major.The final exam is oral. A capstone project is required.
Capstone Project: 4 project credits are required.

This program may be completed with a minor.

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

A minimum GPA of 3.00 is required for students to remain in good standing.

1. Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser and director of graduate studies approval.

2. A minimum GPA of 3.00 is required for students to remain in good standing.

3. The master of science degree is offered under Plan A (thesis) and Plan B (non-thesis). At least 30 credits are required, including 12 credits from 5xxx courses or higher in computer science, 1 credit of CS 8993 Seminar each year for a total of 2 credits, and 6 credits of electives (either any 5xxx or higher courses).

4. Plan A also requires 10 thesis credits (CS 8777).

5. Plan B also requires at least 8 credits in additional courses, 5xxx or above, as well as 4 project credits (CS 8555). Except in very rare instances, the 8 credits of additional courses for Plan B must be computer science courses.

6. All courses are chosen in consultation with the student's adviser, subject to approval by the director of graduate studies. Because of this, Plan B students may want to consider filling their 6 Electives requirement credits from outside CS.

7. Normally 4xxx computer science courses may not be included in degree programs for the master of science in computer science.

Computer Science requirement (14 cr)
Take 12 or more credit(s) from the following:
- CS 5112 - Advanced Theory of Computation (4.0 cr)
- CS 5122 - Advanced Algorithms and Data Structures (4.0 cr)
- CS 5212 - Computer Graphics (4.0 cr)
- CS 5222 - Artificial Intelligence (4.0 cr)
- CS 5232 - Introduction to Machine Learning and Data Mining (4.0 cr)
- CS 5242 - Natural Language Processing (4.0 cr)
- CS 5312 - Operating Systems (4.0 cr)
- CS 5322 - Database Management Systems (4.0 cr)
- CS 5332 - Computer Security (4.0 cr)
- CS 5342 - Compiler Design (4.0 cr)
- CS 5412 - Computer Architecture (4.0 cr)
- CS 5422 - Computer Networks (4.0 cr)
- CS 5612 *{Inactive}*(4.0 cr)
- CS 5642 - Advanced Natural Language Processing (4.0 cr)
- CS 5652 *{Inactive}*(4.0 cr)
- CS 5732 - Advanced Computer Security (4.0 cr)

Graduate Seminar
Take 2 credits, 1 in first Fall semester and 1 in second fall semester, of graduate seminar.
CS 8993 - Seminar (1.0 cr)

Electives (6 cr)

The purpose of this requirement is to provide coursework that will support your degree program without duplicating or overlapping courses available within the graduate CS curriculum. Such courses may be chosen from any 5xxx or higher courses subject to the approval of the director of graduate studies.

Plan A or Plan B (10 - 12 cr)

Plan A

Students must register for 10 credits.

CS 8777 - Thesis Credits: Master's (1.0 - 24.0 cr)

or **Plan B**

Students must complete an approved Plan B Project through registration of 4 credits of CS 8794 - Project Credits: Master's. Master's Plan B Projects represent a significant programming research project that often will extend a large assignment within a 5xxx-level or higher course. Speak to the instructors of 5xxx-level or higher courses to see if the course supports Master's Projects.

Take 4 or more credit(s) from the following:

- CS 8794 - Project Credits: Master's (1.0 - 4.0 cr)

Any CS 5xxx or higher courses, subject to approval by the director of graduate studies.

Take 8 or more credit(s) from the following:

- CS 5xxx
- CS 8xxx