

COMPUTER SCIENCE, MS (ONLINE)

More Information: <https://onlineprograms.case.edu/mscs/>

Degree: Master of Science (MS)

Field of Study: Computer Science

Program Overview

The Department of Computer and Data Sciences offers a fully online Master of Science in Computer Science degree program.

Graduate Policies

For graduate policies and procedures, please review the School of Graduate Studies section of the General Bulletin.

Program Requirements

Pathway and Course-Focused Tracks

The Pathway Project-Focused track requires completion of 34.5 credit hours coursework credit and 6 credit hours of approved coursework. project (CSDS 695). The Course-Focused MS degree program requirements consist of the completion of 30 credit hours of approved coursework. coursework, satisfactory completion of a comprehensive exam, i.e., passing the course ENGR 600 with a grade of "P". Both Pathway and Course-Focused tracks require satisfactory completion of a comprehensive exam, i.e., passing the course ENGR 600 with a grade of "P". ENGR 600 is satisfactorily completed by achieving a grade of B or higher in each one of three courses in the student's depth area.

Project and Thesis Tracks

The Project-Focused track requires 24 credit hours of coursework credit and 6 credit hours of project (CSDS 695).

ENGR 600 consists of Comprehensive Exam questions that are administered in CSDS 410, CSDS 425, CSDS 440, CSDS 444, and CSDS 493. Students must take and pass questions in at least two of these classes. Students who fail one exam in a course may retake that exam one more time but are not required to retake the associated course. The Project-Focused track requires 24 credit hours of coursework credit and 6 credit hours of project (CSDS 695). The Thesis-Focused track requires 18 credit hours of coursework credit and 12 credit hours of thesis (CSDS 651). A BS/MS student is required to choose the thesis-focused track initially.

Both the Thesis-Focused and the Project-Focused track require a formal written report, as well as a final oral examination by a committee of at least three faculty members, two of whom must be primarily affiliated with the CS program. The academic advisor is normally one of the committee members. For Project-Focused track students, the oral examination fulfills the Comprehensive Examination requirement of the School of Graduate Studies.

Track Transfer

If a student wishes to switch from one track to another, the following requirements apply:

- **Deadline.** In each semester, students must request to switch track one week before the date at which Drop/Add ends, as stated in the academic calendar.
- **Pathway, Course-only, Course-only or Project to Thesis.** A course-only student may request to switch to the thesis track only if they (1) have already taken at least 9 credit hours of letter graded CSDS courses and (2) have a GPA of 3.5 or higher and (3) have a TOEFL score of 90 or higher and (4) have the recommendation of a CDS advisor or (co)advisor.
- **Pathway or Course-only to Project.** A course-only student may request to switch to the project thesis track only if they (1) have a TOEFL score of 90 or higher and (2) have the recommendation of a CDS advisor or (co)advisor.
- **Thesis to Project, or Thesis or Project to Course-only.** Such a transfer needs approval from the student's advisor and the department chair.
- **Petition.** If a student fails to satisfy the transfer requirements, a petition may be submitted by a CDS advisor or (co)advisor to the department chair. In no case, petitions may be submitted by non-CDS faculty members or by students.

Students should consult with their academic advisor and/or department to determine the detailed requirements within this framework.

Course Requirements

For all four three tracks, at least 18 credit hours of coursework must be at the 400-level or above.

Students in the pathway track are required to take and pass CSDS 410 in their first semester, and to pass:

- By the end of the second semester, CSDS 401
- By the end of the first academic year or before 18 credit hours of coursework
 - CSDS 410
 - Any one course that is either listed as an undergraduate Computer Science Breadth Requirement or subsumes a computer science breadth course

Students failing the conditions above will be separated from further study in Computer Science. CSDS 401 cannot be counted toward the Course-focused, Project, or Thesis tracks.

All students are required to have specialized knowledge in at least one of the following depth areas, by taking at least three graduate-level classes from that area. The list of acceptable classes is shown below. For research or project-focused tracks, the chosen area should correspond to the student's thesis research area or project in general. CSDS 600 classes will also qualify in this category with approval from the student's advisor. The remaining classes can be (i) any other class from the classes listed below, or (ii) any letter graded CSDS class (see note below), or (iii) at most two graduate-level classes other than those in category (i) and (ii) (such as non-letter-graded graduate CSDS classes or graduate classes in other departments).

(Note: The Graduate School and the School of Engineering limit the number of undergraduate courses that can be taken for credit by Master students.)

Students should discuss their courses with their advisor every semester prior to registration. Students must achieve a grade point average of 3.0 or higher; it is computed for all of the letter-graded courses on the student's academic program.

List of Depth Areas and Corresponding Courses

Code	Title	Credit Hours
1. Algorithms & Theory		
CSDS 410	Analysis of Algorithms	3
CSDS 440	Machine Learning	3
CSDS 455	Applied Graph Theory	3
CSDS 456	Data Privacy	3
CSDS 477	Advanced Algorithms	3
MATH 408	Introduction to Cryptology	3
2. Artificial Intelligence		
CSDS 440	Machine Learning	3
CSDS 442	Causal Learning from Data	3
CSDS 455	Applied Graph Theory	3
CSDS 465	Computer Vision	3
CSDS 491	Artificial Intelligence: Probabilistic Graphical Models	3
CSDS 496	Artificial Intelligence: Sequential Decision Making	3
CSDS 497	Artificial Intelligence: Statistical Natural Language Processing	3
CSDS 499	Algorithmic Robotics	3
ECSE 484	Computational Intelligence I: Basic Principles	3
3. Bioinformatics		
CSDS 410	Analysis of Algorithms	3
CSDS 435	Data Mining	3
CSDS 440	Machine Learning	3
CSDS 456	Data Privacy	3
CSDS 458	Introduction to Bioinformatics	3
CSDS 459	Bioinformatics for Systems Biology	3
SYBB 412	Survey of Bioinformatics: Programming for Bioinformatics	3
4. Computer Networks & Systems		
CSDS 425	Computer Networks I	3
CSDS 427	Internet Security and Privacy	3
CSDS 428	Computer Communications Networks II	3
CSDS 438	High Performance Data and Computing	3
CSDS 444	Computer Security	3
ECSE 414	Wireless Communications	3
5. Databases & Data Mining		
CSDS 433	Database Systems	3
CSDS 435	Data Mining	3
CSDS 440	Machine Learning	3
STAT 426	Multivariate Analysis and Data Mining	3
PQHS 471	Machine Learning & Data Mining	3
6. Security & Privacy		
CSDS 427	Internet Security and Privacy	3
CSDS 444	Computer Security	3
CSDS 448	Smartphone Security	3
CSDS 456	Data Privacy	3
CSDS 493	Software Engineering	3
MATH 408	Introduction to Cryptology	3
7. Software Engineering		
CSDS 425	Computer Networks I	3

CSDS 433	Database Systems	3
CSDS 438	High Performance Data and Computing	3
CSDS 442	Causal Learning from Data	3
CSDS 444	Computer Security	3
CSDS 448	Smartphone Security	3
CSDS 493	Software Engineering	3