



Morris Campus

Computer Science B.A.

Division of Science & Mathematics - Adm

Division of Science and Mathematics

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2015
- Required credits to graduate with this degree: 120
- Required credits within the major: 53
- Degree: Bachelor of Arts

The computer science curriculum is designed to not only provide a solid background in fundamentals, but also to continuously respond to rapid changes in the field of computing by equipping our students with modern tools, approaches, and cutting-edge concepts and technologies. Coursework in computer science spans three core areas of computing, including theory, software development, and systems. Beginning computer science courses are open to non-majors and satisfy the mathematical and symbolic reasoning component of the general education requirements. All computer science majors must complete a senior seminar capstone experience, and the discipline prides itself on the high quality of students' papers and presentations in this course. The program also includes mathematics or statistics in the required coursework.

Computer science majors develop software, explore hardware systems, and apply theoretical concepts. Reflecting the collaborative nature of today's world, team work is heavily integrated into computer science coursework. Students are encouraged to use and supplement their formal education through research opportunities, internship experiences, programming and robotics competitions, and student and professional organizations. Many students take advantage of the opportunity to collaborate with computer science faculty on research projects, presenting the results at international, national, and regional conferences, as well as at UMM's Undergraduate Research Symposium.

Study in computer science is required for management and math majors at UMM, as well as for students pursuing a variety of pre-engineering programs. Many UMM computer science majors enter the job market upon graduation, primarily in the computing industry. Others pursue postgraduate work toward a masters or doctoral degree in computing, business, library science, or a variety of other fields.

Objectives--the computer science discipline is designed to:

- * serve students from other disciplines requiring knowledge of computer science;
- * advance student learning in computer science at a depth and breadth appropriate to undergraduates;
- * advance student competence in research in computer science;
- * advance student writing and presentation skills appropriate for the field;
- * advance student teamwork and collaboration skills; and
- * prepare students for careers in industrial settings and/or postgraduate work in computing.

Program Delivery

This program is available:

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

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements. For more information, see the [general education requirements](#).

Program Requirements

Students are required to take 2 semester(s) of any second language.

Grades of D or D+ in CSCI 1201, 1301, 1302, and 2101 may not be used to meet the major requirements.

No more than one course with a grade of D or D+, offset by an equivalent number of credits of A or B grades, may be used to meet the requirements for a computer science major.

Courses may not be taken S-N unless offered S-N only. A minimum GPA of 2.00 is required in the major to graduate. The GPA includes all, and only, University of Minnesota coursework. Grades of "F" are included in GPA calculation until they are replaced.

Elective courses: computer science major electives are divided into three areas: systems courses (CSCI 44xx), theory courses (CSCI 45xx), and programming and languages courses (CSCI 46xx). The discipline offers an array of courses in each area. The courses listed are representative of the courses offered. New courses are continually developed and added to keep up with changes in the field.

Required Courses

- CSCI 1302 - Foundations of Computer Science [M/SR] (4.0 cr)
 - CSCI 2101 - Data Structures [M/SR] (5.0 cr)
 - CSCI 3413 - Computing Systems: Concepts (3.0 cr)
 - CSCI 3412 - Computing Systems: Practicum (2.0 cr)
 - CSCI 3501 - Algorithms and Computability (5.0 cr)
 - CSCI 3601 - Software Design and Development (5.0 cr)
 - CSCI 4901 - Senior Seminar (2.0 cr)
 - IS 1091W - Ethical and Social Implications of Technology [E/CR] (2.0 cr)
- Take one of the following:
- CSCI 1201 *{Inactive}* [M/SR] (4.0 cr)
 - or CSCI 1301 - Problem Solving and Algorithm Development [M/SR] (4.0 cr)

Elective Courses

Take 10 or more credit(s) including exactly 3 sub-requirements(s) from the following:

Computing Systems Courses (44xx):

Take 2 - 4 credit(s) from the following:

- CSCI 4403 - Systems: Data Mining (4.0 cr)
- CSCI 4406 *{Inactive}* (2.0 cr)
- CSCI 4409 - Systems: Programming for Parallel Architecture (2.0 cr)
- CSCI 4451 *{Inactive}* (4.0 cr)
- CSCI 4452 *{Inactive}* (4.0 cr)
- CSCI 4453 - Systems: Database Systems (4.0 cr)
- CSCI 4454 - Systems: Robotics (4.0 cr)
- CSCI 4456 *{Inactive}* (4.0 cr)
- CSCI 4457 - Systems: Ubiquitous Computing (4.0 cr)
- CSCI 4458 - Systems: Bioinformatic Systems (4.0 cr)
- CSCI 4459 *{Inactive}* (4.0 cr)

Theory Courses (45xx):

Take 2 - 4 credit(s) from the following:

- CSCI 4506 - Theory: Fuzzy Logic and Fuzzy Sets (2.0 cr)
- CSCI 4507 *{Inactive}* (2.0 cr)
- CSCI 4508 *{Inactive}* (2.0 cr)
- CSCI 4511 *{Inactive}* (2.0 cr)
- CSCI 4552 *{Inactive}* (4.0 cr)
- CSCI 4553 - Theory: Evolutionary Computation and Artificial Intelligence (4.0 cr)
- CSCI 4554 - Theory: Cryptography (4.0 cr)
- CSCI 4555 - Theory: Neural Networks and Machine Learning (4.0 cr)
- CSCI 4556 *{Inactive}* (4.0 cr)
- CSCI 4557 - Theory: Quantum Computing (4.0 cr)

Processes, Programming, and Languages Courses (46xx):

Take 2 - 4 credit(s) from the following:

- CSCI 4604 - Processes, Programming, and Languages: Graphical User Interfaces (2.0 cr)
- CSCI 4605 - Processes, Programming, and Languages: Refactoring (2.0 cr)
- CSCI 4651 - Processes, Programming, and Languages: Programming Languages (4.0 cr)
- CSCI 4652 *{Inactive}* (4.0 cr)
- CSCI 4653 *{Inactive}* (4.0 cr)
- CSCI 4654 - Processes, Programming, and Languages: Modern Functional Programming (4.0 cr)
- CSCI 4655 *{Inactive}* (4.0 cr)
- CSCI 4656 - Processes, Programming, and Languages: Human-Computer Interaction and Interface Design (4.0 cr)
- CSCI 4657 - Processes, Programming, and Languages: Programming Languages for Client-Server Systems (4.0 cr)
- CSCI 4658 - Processes, Programming, and Languages: Usability, Design, and Mobile Technologies (4.0 cr)

Math and Statistics Electives

MATH 1101 and above, excluding MATH 2211, or STAT 2xxx and above.

Take 12 or more credit(s) from the following:

- CSCI 2701 - Introduction to Data Science [M/SR] (4.0 cr)
- MATH 1101 - Calculus I [M/SR] (5.0 cr)



- [MATH 1102](#) - Calculus II [M/SR] (5.0 cr)
- [MATH 2101](#) - Calculus III [M/SR] (4.0 cr)
- [MATH 3111](#) - Linear Algebra (4.0 cr)
- [MATH 2202](#) - Mathematical Perspectives [M/SR] (4.0 cr)
- [MATH 2401W](#) - Differential Equations [M/SR] (4.0 cr)
- [MATH 2501](#) - Probability and Stochastic Processes [M/SR] (4.0 cr)
- MATH 3xxx
- MATH 4xxx
- STAT 2xxx
- STAT 3xxx
- STAT 4xxx