Twin Cities Campus

Computer Science Minor

CLA Dean's Office

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Spring 2019
- Required credits in this minor: 17 to 20

The computer science minor is for students who want to take a basic core of computer science courses to enhance or supplement their major programs. Knowledge of computing is useful for students majoring in engineering, the physical, biological and social sciences, business, design and the visual arts, just to name a few. The minor increases job opportunities and provides a base for more advanced studies and independent learning.

The minor teaches problem solving and computational thinking skills, as well as fundamental programming concepts, practical knowledge of computer programming languages, data structures, and algorithmic development techniques that are essential to modern computing. Students have flexibility in choosing courses to meet the minor requirements. Advanced courses provide detailed knowledge in specific topics, such as data bases, networks, internet programming, or game design.

To succeed, students in the minor must have solid analytical and abstraction skills. Students who are not planning on taking calculus should plan to take at least one other math course before starting the minor, such as MATH 1031 or MATH 1051.

Program Delivery

This program is available:

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

Minor Requirements

Students who wish to complete the minor should consult with the computer science advisor in 4-192 Keller Hall to discuss course choices and finalize the declaration process.

Students may earn no more than one undergraduate degree in computer science: a BA or a BS or a minor. Additionally, students who earn a B.Comp.E. in computer engineering may not minor in computer science.

Other coursework may be accepted with prior advisor approval.

The computer science minor consists of 5 three- or four-credit, advisor-approved CSCI courses.

Computer Science Introductory Core

Option 1 is the recommended sequence. Sequences cannot be mixed and matched. Students who have AP credit in computer science will receive credit for CSCI 1103 and must take CSCI 1913 (Option 2).

Take exactly 2 course(s) totaling exactly 8 credit(s) from the following:

Option 1

CSCI 1133 - Introduction to Computing and Programming Concepts (4.0 cr)
or CSCI 1133H - Honors Introduction to Computing and Programming Concepts (4.0 cr)
CSCI 1933 - Introduction to Algorithms and Data Structures (4.0 cr)

•Option 2

CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
CSCI 1913 - Introduction to Algorithms, Data Structures, and Program Development (4.0 cr)

Electives

Any CSCI 2xxx, 4xxx, 5xxx may count towards this requirement, except CSCI 2980 & 4921. No CSCI 3xxx courses count towards this requirement. CSCI 49xx & 59xx courses may be accepted, but only with prior advisor approval.

Take exactly 3 course(s) from the following:

Lower-Division Electives

Take 0 - 2 course(s) from the following:

- •CSCI 2021 - Machine Architecture and Organization (4.0 cr)
- •CSCI 2033 - Elementary Computational Linear Algebra (4.0 cr)
- •CSCI 2041 - Advanced Programming Principles (4.0 cr)
- •CSCI 2011 - Discrete Structures of Computer Science (4.0 cr)

or CSCI 2011H - Honors Discrete Structures of Computer Science (4.0 cr)

•Upper-Division Electives

Take 1 - 3 course(s) from the following:

- CSCI 4011 - Formal Languages and Automata Theory (4.0 cr)
- CSCI 4061 - Introduction to Operating Systems (4.0 cr)
- CSCI 4131 - Internet Programming (3.0 cr)
- CSCI 4611 - Programming Interactive Computer Graphics and Games (3.0 cr)
- CSCI 5103 - Operating Systems (3.0 cr)
- CSCI 5105 - Introduction to Distributed Systems (3.0 cr)
- CSCI 5106 - Programming Languages (3.0 cr)
- CSCI 5115 - User Interface Design, Implementation and Evaluation (3.0 cr)
- CSCI 5117 - Developing the Interactive Web (3.0 cr)
- CSCI 5125 - Collaborative and Social Computing (3.0 cr)
- CSCI 5127W - Embodied Computing: Design & Prototyping [WI] (3.0 cr)
- CSCI 5143 - Real-Time and Embedded Systems (3.0 cr)
- CSCI 5161 - Introduction to Compilers (3.0 cr)
- CSCI 5221 - Foundations of Advanced Networking (3.0 cr)
- CSCI 5231 *{Inactive}*(3.0 cr)
- CSCI 5271 - Introduction to Computer Security (3.0 cr)
- CSCI 5302 - Analysis of Numerical Algorithms (3.0 cr)
- CSCI 5304 - Computational Aspects of Matrix Theory (3.0 cr)
- CSCI 5403 *{Inactive}*(3.0 cr)
- CSCI 5421 - Advanced Algorithms and Data Structures (3.0 cr)
- CSCI 5451 - Introduction to Parallel Computing: Architectures, Algorithms, and Programming (3.0 cr)
- CSCI 5461 - Functional Genomics, Systems Biology, and Bioinformatics (3.0 cr)
- CSCI 5471 - Modern Cryptography (3.0 cr)
- CSCI 5481 - Computational Techniques for Genomics (3.0 cr)
- CSCI 5512 - Artificial Intelligence II (3.0 cr)
- CSCI 5521 - Machine Learning Fundamentals (3.0 cr)
- CSCI 5523 - Introduction to Data Mining (3.0 cr)
- CSCI 5525 - Machine Learning: Analysis and Methods (3.0 cr)
- CSCI 5551 - Introduction to Intelligent Robotic Systems (3.0 cr)
- CSCI 5552 - Sensing and Estimation in Robotics (3.0 cr)
- CSCI 5561 - Computer Vision (3.0 cr)
- CSCI 5607 - Fundamentals of Computer Graphics 1 (3.0 cr)
- CSCI 5608 - Fundamentals of Computer Graphics II (3.0 cr)
- CSCI 5609 - Visualization (3.0 cr)
- CSCI 5611 - Animation & Planning in Games (3.0 cr)
- CSCI 5619 - Virtual Reality and 3D Interaction (3.0 cr)
- CSCI 5708 - Architecture and Implementation of Database Management Systems (3.0 cr)
- CSCI 5715 - From GPS, Google Maps, and Uber to Spatial Data Science (3.0 cr)
- CSCI 5801 - Software Engineering I (3.0 cr)
- CSCI 5802 - Software Engineering II (3.0 cr)
- CSCI 4041 - Algorithms and Data Structures (4.0 cr)

  or CSCI 4041H *{Inactive}*(4.0 cr)
- CSCI 4203 - Computer Architecture (4.0 cr)

  or EE 4363 - Computer Architecture and Machine Organization (4.0 cr)
- CSCI 4211 - Introduction to Computer Networks (3.0 cr)

  or CSCI 5211 - Data Communications and Computer Networks (3.0 cr)
- CSCI 4511W - Introduction to Artificial Intelligence [WI] (4.0 cr)

  or CSCI 5511 - Artificial Intelligence I (3.0 cr)
- CSCI 4707 - Practice of Database Systems (3.0 cr)

  or CSCI 5707 - Principles of Database Systems (3.0 cr)
- CSCI 5204 - Advanced Computer Architecture (3.0 cr)

  or EE 5364 - Advanced Computer Architecture (3.0 cr)