

Computer Science - Master of Computer Science, Master of Science in Computer Science

For information, contact:

Director of Graduate Programs
Department of Computer Science and Software Engineering
262 McVey Data Science Building, 513-529-0340
csGraduate@MiamiOH.edu
<http://www.cse.MiamiOH.edu/csmasters>

Master of Computer Science Introduction

The Master of Computer Science is a coursework-only graduate program. The mission of the Master of Computer Science program is to prepare students for computing professions with foundational and advanced coursework, opportunity to work on industrial projects, and flexible pathways to the degree. Through advanced coursework, students can gain experience in areas such as: artificial intelligence, machine learning, data science, cybersecurity, computer vision, high-performance computing, Internet-of-Things, and software engineering. These courses will be taught by outstanding faculty and researchers in these fields.

Admission and Application Requirements

Applicants for admission into the coursework-only Master of Computer Science program should hold at least the equivalent of a minor in Computer Science or Software Engineering. It is preferred that applicants hold a bachelor's degree in one of these fields or another that is closely related. Specifically, successful applicants to our program should have mastered the following undergraduate topics:

- Imperative and/or functional programming
- Object-oriented programming
- Basic algorithms and/or complexity
- Computer organization and architecture
- Concurrent and/or parallel programming
- Software development methods and tools
- Probability and statistics
- Discrete mathematics or linear algebra

Applicants are expected to meet the following criteria:

- Undergraduate GPA: Equivalent of at least 3.00 on a 4.00 scale
- Proof of English Proficiency Minimum Scores (when required)
 - TOEFL IBT: 80+, 100+ is preferred
 - IELTS Overall \geq 6.5
 - PTE \geq 54
- The GRE is optional but recommended. If submitted, the desired Quantitative score is 60th percentile or higher, the preferred Verbal score is 35th percentile or higher, and the preferred Analytical Writing score is 25th percentile or higher.

Applications must also include two recommendation letters and a résumé.

Combined Bachelor/Master's Program

Undergraduate students may apply to participate in the combined Bachelor/ Master of Computer Science program. This program allows the student to pursue a coursework-only master's degree in an accelerated manner while simultaneously completing a bachelor's degree. Students admitted to the combined degree program may count six to nine credit hours of their graduate coursework towards their bachelor's degree. This enables them to complete their degrees in an accelerated fashion. With an undergraduate major in computer science or software engineering, it is possible for students to complete the combined program in five years.

Admission to the combined program Bachelor/ Master of Computer Science requires a GPA of 3.00 or higher after earning a minimum of 64 credit hours. Please contact the department for more information.

Program Requirements

(30 semester hours)

The total course of instruction includes a minimum of 30 credit hours. Students must complete 24-27 hours of graduate level coursework and 3-6 hours of a culminating experience.

Coursework Requirement (24-27 credit hours)

Students must complete 24-27 hours of graduate-level coursework. All 500 and 600-level CSE courses are acceptable for fulfilling this requirement, with the exception of CSE 566, 600, 601, 610, 611, 630, and 640.

- Students must complete at least three courses (nine hours) that are at or above the 600 level.
- Students must earn a grade of 'C' or higher in all courses taken to meet degree requirements.

Code	Title	Credit Hours
Select 24-27 hours of graduate level coursework:		24-27
CSE 501	Software Quality Assurance and Testing	
CSE 511	Introduction to Model-Driven Software Engineering	
CSE 532	Machine Learning	
CSE 533	Deep Learning	
CSE 534	Generative Artificial Intelligence	
CSE 543	High Performance Computing & Parallel Programming	
CSE 544	Applied Cryptography	
CSE 551	Web Services and Service Oriented Architectures	
CSE 564	Algorithms	
CSE 565	Comparative Programming Languages	
CSE 567	Computer and Network Security	
CSE 570	Special Topics in CSE	
CSE 573	Automata, Formal Languages, and Computability	
CSE 574	Compiler Design	
CSE 580	Special Problems	

CSE 584	Algorithms II
CSE 585	Advanced Database Systems
CSE 586	Introduction to Artificial Intelligence
CSE 587	Game Design and Implementation
CSE 588	Image Processing & Computer Vision
CSE 589	Advanced Graphics and Game Engine Design
At least 9 hours should be at the 600 level or above:	
CSE 616	Simulation of Physical Systems
CSE 617	Advanced Networks
CSE 620	Special Topics in Computer Science Applications
CSE 621	Foundations of Software Engineering
CSE 627	Machine Learning
CSE 650	Special Topics in Computer Science Theory
CSE 664	Advanced Algorithms
CSE 667	Cryptography
CSE 671	Software Quality
CSE 690	Graduate Research

Total Credit Hours **24-27**

Additional Graduate Courses

Graduate level courses chosen in consultation with the Graduate Director may be counted towards the coursework requirements for the degree.

Culminating Experience Requirement (3-6 hours)

Students must complete 3-6 hours of culminating experience, which may take the form of an internship, a non-thesis project, or the CSE 648 culminating experience course.

Code	Title	Credit Hours
CSE 640 or CSE 704 or CSE 648	Internship Non-Thesis Project Professional Computing Experience	3-6
Total Credit Hours		3-6

Master of Science in Computer Science

Introduction

The mission of the Master of Science in Computer Science program is to prepare students for computing professions that require research, invention, and advanced or specialized knowledge. This includes possible pursuit of a PhD in computer science. Students (who are expected to hold a bachelor's degree in computer science or a closely related field) shall complete and document work on independent research with a faculty advisor and study advanced topics in computer science. The advanced coursework and experience in research and invention prepares students for work at the cutting edge of computer science.

Admission and Application Requirements

Applicants for admission into the thesis-based Master of Science in Computer Science program should hold at least the equivalent of a minor in Computer Science or Software Engineering. It is preferred

that applicants hold a bachelor's degree in one of these fields or another that is closely related. Specifically, successful applicants to our program should have mastered the following undergraduate topics:

- Imperative and/or functional programming
- Object-oriented programming
- Basic algorithms and/or complexity
- Computer organization and architecture
- Concurrent and/or parallel programming
- Software development methods and tools
- Differential and integral calculus
- Probability and statistics
- Discrete mathematics or linear algebra

Applicants are expected to meet the following criteria:

- Undergraduate GPA: Equivalent of at least 3.00 on a 4.00 scale
- Proof of English Proficiency Minimum Scores (when required)
 - TOEFL IBT: 80+, 100+ is preferred
 - IELTS Overall ≥ 6.5
 - PTE ≥ 54
- The GRE test is optional, but recommended. The expected Quantitative score is 60th percentile or higher. The preferred Verbal score is 35th percentile or higher and Analytical writing score 25th percentile or higher.

Applicants are ranked for admission based on these criteria as well as recommendation letters, a statement of purpose, and interview results.

Combined Bachelor/Master's Program

Undergraduate students may apply to participate in the combined Bachelor/ Master of Science in Computer Science program. This program allows the student to pursue a thesis-based master's degree in an accelerated manner while simultaneously completing a bachelor's degree. Students admitted to the combined degree program may count six to nine credit hours of their graduate coursework towards their bachelor's degree. This enables them to complete their degrees in an accelerated fashion. With an undergraduate major in computer science or software engineering, it is possible for students to complete the combined program in five years.

Admission to the combined Bachelor/ Master of Science in Computer Science program requires a GPA of 3.25 or higher after earning a minimum of 64 credit hours. Please contact the department for more information.

Program Requirements

(31 semester hours)

The total course of instruction includes a minimum of 31 credit hours. Students must complete both research and advanced coursework requirements. The research requirement includes four hours of formal coursework related to research and a minimum of nine hours of thesis research. The coursework requirement includes 18 hours of graduate level coursework. All students in the program are expected to attend thesis proposal and defense presentations as well as other research presentations while enrolled in the program.

Research Requirement (13 credit hours minimum)

The research requirement includes four hours of structured preparation of students to conduct, evaluate, and document Computer Science research followed by a minimum of nine credit hours of thesis research. All students must write and successfully defend a Master's Thesis in order to graduate from the program.

- CSE 601 Computer Science Research Methods (3)
- CSE 602 Emerging Topics in Computer Science (1)
- Nine credit hours of CSE 700 Research for Master's Thesis (9)

Students must be successful in formally proposing and presenting a research problem in order to pass CSE 602.

Code	Title	Credit Hours
CSE 601	Computer Science Research Methods	3
CSE 602	Emerging Topics in Computer Science (Emerging Topics in Computer Science)	1
CSE 700	Research for Master's Thesis	9
Total Credit Hours		13

Coursework Requirement (18 credit hours)

Students must complete 18 hours of graduate-level course work. All 500 and 600-level CSE courses are acceptable for fulfilling this requirement, with the exception of CSE 566, 600, 601, 609, 610, 611, 630, and 640.

- Students must complete at least three courses (nine hours) that are at or above the 600 level.
- Students must earn a grade of 'C' or higher in all courses taken to meet degree requirements.

Code	Title	Credit Hours
Select 18 hours of graduate level coursework:		18
CSE 501	Software Quality Assurance and Testing	
CSE 511	Introduction to Model-Driven Software Engineering	
CSE 532	Machine Learning	
CSE 543	High Performance Computing & Parallel Programming	
CSE 551	Web Services and Service Oriented Architectures	
CSE 564	Algorithms	
CSE 565	Comparative Programming Languages	
CSE 567	Computer and Network Security	
CSE 570	Special Topics in CSE	
CSE 573	Automata, Formal Languages, and Computability	
CSE 574	Compiler Design	
CSE 584	Algorithms II	
CSE 585	Advanced Database Systems	
CSE 586	Introduction to Artificial Intelligence	
CSE 587	Game Design and Implementation	
CSE 588	Image Processing & Computer Vision	
CSE 589	Advanced Graphics and Game Engine Design	

At least 9 hours should be at the 600 level or above:

CSE 616	Simulation of Physical Systems
CSE 617	Advanced Networks
CSE 618	
CSE 620	Special Topics in Computer Science Applications
CSE 621	Foundations of Software Engineering
CSE 627	Machine Learning
CSE 650	Special Topics in Computer Science Theory
CSE 664	Advanced Algorithms
CSE 667	Cryptography
CSE 671	Software Quality
CSE 690	Graduate Research

Total Credit Hours **18**

Additional Graduate Courses

Graduate level courses chosen in consultation with the student's research advisor may be counted towards the coursework requirements for the degree if approved by the department Graduate Director.