Graduate Minor in
Computer Science

Computing has become the key enabler of fabulously rapid advances across nearly all disciplines of the academy and throughout all segments of society. In order to conduct state-of the-art research in nearly any discipline, students now must contribute to—or even design and develop by themselves—sophisticated discipline specific software systems. Moreover, looking at problems through the lens of "computational thinking" can bring new insights even when discipline-specific software is not involved. The ***Graduate Minor in Computer Science***, administered by the OSU Department of Computer Science and Engineering (CSE), is designed to provide such knowledge and skill. It educates existing graduate students in conceptual aspects of computing and/or state-of-the-practice industrial-strength software technologies that will help them better carry out their primary graduate work.

Impact for the Student

Completion of the program leads to a transcript designation that can and should be advertised to prospective employers. Candidates with not only discipline-specific knowledge but also a clear conception of computational thinking and the knowledge and skill to contribute to advanced software systems in their discipline are increasingly valuable across academia and industry. Prospective employees who distinguish themselves with the knowledge and skill to communicate clearly with professional software developers, and to help develop discipline-specific software systems, are very attractive to most employers.

Curriculum

The Computer Science Graduate Minor consists of a total of 10 graduate cr-hrs selected in consultation with the program coordinator, including at most 1 cr-hr of CSE 425x.

Prerequisites

Due to demand, we currently restrict admission to existing PhD students in their second year of their program.

Some courses are academically accessible to interested graduate students throughout the university with modest prerequisites: mathematical maturity and some prior programming experience. Graduate students in Engineering, Mathematics, Physical Sciences, and Biological Sciences are likely to have the required background from their undergraduate studies, as are many students from other disciplines where the Computer Science Graduate Minor could be most useful (e.g., Social and Behavioral Sciences such as Economics, Geography, Linguistics, and Psychology). Some courses require specific undergraduate prerequisite background in mathematics or programming beyond the generic competencies described above. While courses providing such background may be taken by non-CSE graduate students here at OSU, they generally do not count for graduate credit (and do not count as part of the minor).

Getting Started

Prospective students should begin by contacting the program coordinator, obtaining advice and approval for their planned program, and completing paperwork with course selections. Contact information for program coordinators:

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Suggested tracks and courses listed below.

COMPUTER SCIENCE GRAD MINOR PROGRAM REQUIREMENTS

Complete 10 graduate cr-hrs in CSE, including at most 1 cr-hr of CSE 425x, in a coherent individualized program **worked out with the CS Grad Minor program coordinator. Some *suggested* coherent tracks are** shown **below.**

Software Engineering Track	Course#	Cr-hrs
Software II: Software Development and Design	CSE 5023	3
Software Engineering Techniques	CSE 5231	2
Software Requirements Analysis	CSE 5232	2
Distributed Enterprise Computing	CSE 5234	3
Applied Enterprise Architectures and Services	CSE 5235	3
Mobile Application Development	CSE 5236	3
Principles of Programming Languages	CSE 5341	2
Intermediate Studies in Software Engineering	CSE 5239	2
Capstone Design: Software Applications	CSE 5911	4
Total Software Engineering Track (>=10)		

Artificial Intelligence Track	Course#	Cr-hrs
Survey of Artificial Intelligence for Non-Majors	CSE 5052	3
Machine Learning and Statistical Pattern Recognition	CSE 5523	3
Computer Vision for Human-Computer Interaction	CSE 5524	3
Foundations of Speech and Language Processing	CSE 5525	3
Introduction to Neural Networks	CSE 5526	3
Intermediate Studies in Artificial Intelligence	CSE 5539	2
Capstone Design: Knowledge-Based Systems	CSE 5914	4
Foundations of Applied Artificial Intelligence for Non-Majors	CSE 6520	3
Artificial Intelligence	CSE 6521	3
Total Artificial Intelligence Track (>=10)		

Computer Graphics Track	Course#	Cr-hrs
Computer Game and Animation Techniques	CSE 5541	2
Real-Time Rendering	CSE 5542	3
Geometric Modeling	CSE 5543	3
Intermediate Studies in Computer Graphics	CSE 5559	2
Capstone Design: Game Design and Development	CSE 5912	4
Capstone Design: Computer Animation	CSE 5913	4
Total Computer Graphics Track (>=10)		

Information Security Track	Course#	Cr-hrs
Computer Networking and Internet Technologies	CSE 5461	2
Network Programming	CSE 5462	3
Introduction to Wireless Networking	CSE 5463	3
Intermediate Studies in Computer Networking	CSE 5469	2
Network Security	CSE 5473	3
Distributed Algorithms	CSE 6333	3
Computer Communication Networks	CSE 6461	3
Total Information Security Track (>=10)		

Computer Systems Track	Course#	Cr-hrs
Introduction to Computer Architecture	CSE 5421	2
Systems II: Introduction to Operating Systems	CSE 5431	2
Operating Systems Laboratory	CSE 5433	3
Introduction to Parallel Computing	CSE 5441	3
Computer Architecture	CSE 6421	3
Advanced Operating Systems	CSE 6431	3
Intermediate Studies in Computer Architecture	CSE 5429	2
Intermediate Studies in Operating Systems	CSE 5439	2
Intermediate Studies in Parallel Computing	CSE 5449	2
Total Computer Systems Track (>=10)		

Information Security Track	Course#	Cr-hrs
Information Security	CSE 4471	3
Introduction to Cryptography	CSE 5351	3
Intermediate Studies in Cryptography	CSE 5359	2
Computer Networking and Internet Technologies	CSE 5461	2
Information Security Projects	CSE 5472	3
Network Security	CSE 5473	3
Social, Ethical, and Professional Issues in Computing	CSE 5501	1
Intermediate Studies in Computer Security	CSE 5479	2
Total Information Security Track (>=10)		

Database Track	Course#	Cr-hrs
Introduction to Database Systems	CSE 5241	2
Advanced Database Management Systems	CSE 5242	3
Introduction to Data Mining	CSE 5243	3
Intermediate Studies in Databases	CSE 5249	2
Capstone Design: Information Systems	CSE 5915	4
Total Database Track (>=10)		

Foundations/Theory Track	Course#	Cr-hrs
Automata and Formal Languages	CSE 5321	2
Foundations II: Data Structures and Algorithms	CSE 5331	2
Principles of Programming Languages	CSE 5341	2
Introduction to Cryptography	CSE 5351	3
Numerical Methods	CSE 5361	3
Computability and Complexity	CSE 6321	3
Algorithms	CSE 6331	3
Advanced Algorithms	CSE 6332	3
Distributed Algorithms	CSE 6333	3
Foundations of Programming Languages	CSE 6341	3
Intermediate Studies in Computation Theory	CSE 5329	2
Intermediate Studies in Algorithms	CSE 5339	2
Intermediate Studies in Programming Languages	CSE 5349	2
Intermediate Studies in Cryptography	CSE 5359	2
Total Foundations/Theory Track (>=10)		

Computational Science Track	Course#	Cr-hrs
Numerical Methods	CSE 5361	3
Introduction to Computer Architecture	CSE 5421	2
Systems II: Introduction to Operating Systems	CSE 5431	2
Introduction to Parallel Computing	CSE 5441	3
Parallel Computing	CSE 6441	3
Intermediate Studies in Parallel Computing	CSE 5449	2
Total Computational Science Track (>=10)		