COMPUTER SCIENCE MINOR

College of Computer, Mathematical and Physical Sciences
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The purpose of the minor in Computer Science is not only to give students a strong foundation in and understanding of algorithmic reasoning, problem solving methods involving computers and computation, as well as a solid base to help students adapt to future changes in technology, but to complement and enhance any student's major program of study.

The Computer Science minor is selective, and students must meet the same entrance requirements as the Computer Science major. Information on how to apply for the minor can be found at https://undergrad.cs.umd.edu/computer-science-minor (https://undergrad.cs.umd.edu/computer-science-minor/).

REQUIREMENTS

The minor in Computer Science consists of 15-24 credits; all courses must be completed with a grade of "C-" or better. MATH140 and CMSC131 are pre-requisites for entrance into the curriculum for the minor.

Course	Title	Credits
Requirements		
CMSC132	Object-Oriented Programming II [1]	4
CMSC216	Introduction to Computer Systems [1]	4
CMSC250	Discrete Structures [1]	4
CMSC330	Organization of Programming Languages	3
CMSC351	Algorithms	3
Select two of the following: [2]		6
CMSC411	Computer Systems Architecture	
CMSC412	Operating Systems	
CMSC414	Computer and Network Security	
CMSC416	Introduction to Parallel Computing	
CMSC417	Computer Networks	
CMSC420	Advanced Data Structures	
CMSC421	Introduction to Artificial Intelligence	
CMSC422	Introduction to Machine Learning	
CMSC423	Bioinformatic Algorithms, Databases, and Tools	
CMSC424	Database Design	
CMSC426	Computer Vision	
CMSC427	Computer Graphics	
CMSC430	Introduction to Compilers	
CMSC433	Programming Language Technologies and Paradigms	
CMSC434	Introduction to Human-Computer Interaction	
CMSC435	Software Engineering	
CMSC436	Programming Handheld Systems	
CMSC451	Design and Analysis of Computer Algorithms	
CMSC452	Elementary Theory of Computation	
CMSC454	Algorithms for Data Science	
CMSC456	Cryptography	
CMSC457	Introduction to Quantum Computing	
CMSC460	Computational Methods	
CMSC466	Introduction to Numerical Analysis I	
CMSC470	Introduction to Natural Language Processing	
CMSC471	Introduction to Data Visualization	
CMSC472	Introduction to Deep Learning	
CMSC474	Introduction to Computational Game Theory	
Total Credits		**24**

[1] Or acceptable score on the CMSC exemption exam.
[2] Note: some of these classes variously have MATH240 or MATH241 as prerequisites.

Notes:

- Students who satisfy all three of CMSC132, CMSC216 and CMSC250 by exemption exam shall take one additional 400 level class from the approved list. This obligation is in addition to all other minor requirements.
- With prior permission of the Undergraduate Director, and at his/her discretion, at most one section (3 credits) of CMSC498, Independent Study, may substitute for one of the two core CS classes at the 400 level. This provision is intended to allow students to pursue unexpected opportunities for study of interdisciplinary topics having a substantial computational component complementing their major.
- Course combinations:
  - Students may not use more than one of CMSC460 or CMSC466 toward the minor.