APPLIED MATHEMATICS MAJOR: COMPUTATION OPTION (B.S.)

https://ceps.unh.edu/mathematics-statistics/program/bs/applied-mathematics-computation-option

Description

This degree program prepares students for employment and/or graduate study in a variety of fields and research specializations in which mathematics plays a critical role in the solution of important scientific and technological problems.

Requirements

Degree Requirements

Minimum Credit Requirement: 128 credits

Minimum Residency Requirement: 32 credits must be taken at UNH

Minimum GPA: 2.0 required for conferral*

Core Curriculum Required: Discovery & Writing Program Requirements

Foreign Language Requirement: No

All Major, Option and Elective Requirements as indicated.
**Major GPA requirements as indicated.*

Major Requirements

In all courses used to satisfy the requirements for its major programs, the Department of Mathematics and Statistics requires that a student earn a grade of C- or better and have an overall grade-point average of at least 2.00 in these courses.

Code	Title	Credits
Required Courses		
MATH 425	Calculus I	4
MATH 426	Calculus II	4
MATH 445	Mathematics and Applications with MATLAB	4
or IAM 550	Introduction to Engineering Computing	
MATH 527	Differential Equations with Linear Algebra [1]	4
MATH 528	Multidimensional Calculus [1]	4
MATH 531	Mathematical Proof	4
MATH 644	Statistics for Engineers and Scientists [2]	4
MATH 645	Linear Algebra for Applications [1]	4
MATH 753	Introduction to Numerical Methods I	4
PHYS 407	General Physics I	4
Capstone		
Select one of the following:		4
MATH 797	Senior Seminar	
MATH 798	Senior Project	
MATH 799	Senior Thesis	
Total Credits		**44**

Code	Title	Credits
Computation Option Requirements		
PHYS 408	General Physics II	4
MATH 745	Foundations of Applied Mathematics I	4
CS 415 & CS 416	Introduction to Computer Science I and Introduction to Computer Science II	8
CS 420	Foundations of Programming for Digital Systems	4
CS 515	Data Structures and Introduction to Algorithms	4
CS 659	Introduction to the Theory of Computation	4
CS 758	Algorithms	4
IAM 751	Introduction to High-Performance Computing	4
Select one elective in consultation with academic advisor		4
Total Credits		**40**

1. The full Linearity sequence, MATH 525 and MATH 526, may be used to replace the MATH 527, MATH 528, and MATH 645 requirements. MATH 525 may be used to replace the MATH 645 requirement.
2. Applied Mathematics: Economics Option students must take MATH 539 Introduction to Statistical Analysis.

Degree Plan

Sample Degree Plan

This sample degree plan serves as a general guide; students collaborate with their academic advisor to develop a personalized degree plan to meet their academic goals and program requirements.

First Year		
Fall		**Credits**
MATH 425	Calculus I	4
CS 415	Introduction to Computer Science I	4
Discovery Course		4
Inquiry Course		4
MATH 400	Freshman Seminar	1
	Credits	**17**
Spring		
MATH 426	Calculus II	4
MATH 445 or IAM 550	Mathematics and Applications with MATLAB or Introduction to Engineering Computing	4
CS 416	Introduction to Computer Science II	4
ENGL 401	First-Year Writing	4
	Credits	**16**
Second Year		
Fall		
MATH 528	Multidimensional Calculus	4
MATH 531	Mathematical Proof	4
PHYS 407	General Physics I	4
CS 420	Foundations of Programming for Digital Systems	4
	Credits	**16**
Spring		
MATH 527	Differential Equations with Linear Algebra	4
MATH 644	Statistics for Engineers and Scientists	4
PHYS 408	General Physics II	4
CS 515	Data Structures and Introduction to Algorithms	4
	Credits	**16**

Third Year		
Fall		
MATH 753	Introduction to Numerical Methods I	4
CS 659	Introduction to the Theory of Computation	4
Discovery Course		4
Elective Course		
	Credits	**12**
Spring		
MATH 645	Linear Algebra for Applications	4
IAM 751	Introduction to High-Performance Computing	4
CS 758	Algorithms	4
Discovery Course		4
	Credits	**16**
Fourth Year		
Fall		
MATH 745	Foundations of Applied Mathematics I	4
Discovery Course		4
Discovery Course		4
Writing Intensive Course		4
	Credits	**16**
Spring		
MATH 797 or MATH 798 or MATH 799	Senior Seminar or Senior Project or Senior Thesis	4
Discovery Course		4
Writing Intensive Course		4
Elective Course		4
	Credits	**16**
	Total Credits	**125**

Student Learning Outcomes

Program Learning Outcomes

- Students recognize common mathematical notations and operations used in mathematics, science and engineering.
- Students can recognize and classify a variety of mathematical models including differential equations, linear and nonlinear systems of algebraic equations, and common probability distributions.
- Students have developed a working knowledge (including notation, terminology, foundational principles of the discipline, and standard mathematical models within the discipline) in at least one discipline outside of mathematics.
- Students are able to extract useful knowledge, both quantitative and qualitative, from mathematical models and can apply that knowledge to the relevant discipline.