

APPLIED MATHEMATICS MAJOR: DYNAMICS AND CONTROL OPTION (B.S.)

<https://ceps.unh.edu/mathematics-statistics/program/bs/applied-mathematics-dynamics-control-option>

Description

Beginning in the 2022/23 academic year, the Applied Mathematics Major: Dynamics and Control option will no longer be accepting new students. Current students will continue to have access to the same high-quality education and resources until they graduate.

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
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	4
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		
MATH 797	Senior Seminar	4
MATH 798	Senior Project	4
MATH 799	Senior Thesis	2 or 4
Total Credits		50-52

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.

Dynamics and Control Option Requirements

Code	Title	Credits
PHYS 408	General Physics II	4
MATH 647	Complex Analysis for Applications	4
MATH 747	Introduction to Nonlinear Dynamics and Chaos	4
ME 525	Statics	3
or CEE 500	Statics for Civil Engineers	
ME 627	Dynamics	3
ECE 633	Signals and Systems I	3
ECE 634	Signals and Systems II	3
ECE 772	Control Systems	4
One approved elective at the 600-700 level, selected in consultation with the academic advisor		4
Total Credits		32

Degree Plan

First Year

Fall		Credits
MATH 425	Calculus I	4
PHYS 407	General Physics I	4
Discovery Course		4
Inquiry Course		4
MATH 400	Freshman Seminar	1
Credits		17

Spring

MATH 426	Calculus II	4
MATH 445	Mathematics and Applications with MATLAB	4
or IAM 550	Introduction to Engineering Computing	
PHYS 408	General Physics II	4
ENGL 401	First-Year Writing	4
Credits		16

Second Year

Fall		
MATH 528	Multidimensional Calculus	4
MATH 644	Statistics for Engineers and Scientists	4
ME 525	Statics	4
Discovery Course		4
	Credits	16
Spring		
MATH 527	Differential Equations with Linear Algebra	4
MATH 531	Mathematical Proof	4
MATH 645	Linear Algebra for Applications	4
Discovery Course		4
	Credits	16

Third Year**Fall**

MATH 647	Complex Analysis for Applications	4
ME 627	Dynamics	3
ECE 633	Signals and Systems I	3
Discovery Course		4
Elective Course		4
Credits		18

Spring

MATH 747	Introduction to Nonlinear Dynamics and Chaos	4
ECE 634	Signals and Systems II	3
600/700-level Elective Course		4
Discovery Course		4
Credits		15

Fourth Year**Fall**

MATH 753	Introduction to Numerical Methods I	4
Discovery Course		4
Writing Intensive Course		4
Elective Course		4
Credits		16

Spring

MATH 797 or MATH 798 or MATH 799	Senior Seminar or Senior Project or Senior Thesis	4
ECE 772	Control Systems	4
Writing Intensive Course		4
Elective Course		4
Credits		16
Total Credits		130

Student 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.