# APPLIED MATHEMATICS MAJOR: SOLID MECHANICS AND VIBRATIONS OPTION (B.S.)

https://ceps.unh.edu/mathematics-statistics/program/bs/applied-mathematics-solid-mechanics-vibrations-option

## Description

***Beginning in the 2022/23 academic year, the Applied Mathematics Major: Solid Mechanics and Vibrations 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 | |
| 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.

## Solid Mechanics and Vibrations Option Requirements

| Code | Title | Credits |
|---|---|---|
| PHYS 408 | General Physics II | 4 |
| MATH 647 | Complex Analysis for Applications | 4 |
| MATH 745 | Foundations of Applied Mathematics I | 4 |
| ME 525 | Statics | 3 |
| or CEE 500 | Statics for Civil Engineers | |
| ME 526 | Mechanics of Materials | 3 |
| or CEE 501 | Strength of Materials | |
| ME 561 | Introduction to Materials Science | 4 |
| ME 627 | Dynamics | 3 |
| **Select TWO from the following:** | | **8** |
| ME 727 | Advanced Mechanics of Solids | |
| ME #730 | Mechanical Behavior of Materials | |
| | 700-level elective, selected in consultation with the academic advisor | |
| **Total Credits** | | **33** |

## 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 or IAM 550 | Mathematics and Applications with MATLAB or Introduction to Engineering Computing | 4 |
| 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 |
| ME 526 | Mechanics of Materials | 3 |
| | **Credits** | **15** |
| **Third Year** | | |
| **Fall** | | |
| MATH 647 | Complex Analysis for Applications | 4 |
| MATH 745 | Foundations of Applied Mathematics I | 4 |
| ME 627 | Dynamics | 3 |
| Discovery Course | | 4 |
| Discovery Course | | 4 |
| | **Credits** | **19** |
| **Spring** | | |
| ME 561 | Introduction to Materials Science | 4 |
| Elective Course | | 4 |
| Discovery Course | | 4 |
| Writing Intensive Course | | 4 |
| | **Credits** | **16** |
| **Fourth Year** | | |
| **Fall** | | |
| MATH 753 | Introduction to Numerical Methods I | 4 |
| Elective Course | | 4 |
| Discovery Course | | 4 |
| Writing Intensive Course | | 4 |
| | **Credits** | **16** |
| **Spring** | | |
| MATH 797<br>  or MATH 798<br>  or MATH 799 | Senior Seminar<br>  or Senior Project<br>  or Senior Thesis | 4 |
| Elective Course | | 4 |
| Elective Course | | 4 |
| Elective Course | | 4 |
| | **Credits** | **16** |
| | **Total Credits** | **131** |

# 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.