

# APPLIED MATHEMATICS MAJOR: FLUID DYNAMICS OPTION (B.S.)

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

## Description

*Beginning in the 2022/23 academic year, the Applied Mathematics Major: Fluid Dynamics 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 <sup>1</sup>	4
MATH 528	Multidimensional Calculus <sup>1</sup>	4
MATH 531	Mathematical Proof	4
MATH 644	Statistics for Engineers and Scientists <sup>2</sup>	4
MATH 645	Linear Algebra for Applications <sup>1</sup>	4
MATH 753	Introduction to Numerical Methods I	4
PHYS 407	General Physics I	4
<b>Capstone: Select one of the following</b>		
MATH 797	Senior Seminar	4
MATH 798	Senior Project	4
MATH 799	Senior Thesis	2 or 4
<b>Total Credits</b>		<b>50-52</b>

<sup>1</sup> 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.

<sup>2</sup> Applied Mathematics: Economics Option students must take MATH 539 Introduction to Statistical Analysis.

## Fluid Dynamics 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 503	Thermodynamics	3
ME 525	Statics	3
or CEE 500	Statics for Civil Engineers	
ME 608	Fluid Dynamics	3
ME 627	Dynamics	3
<b>Select TWO of the following courses</b>		<b>6-8</b>
ME 707	Analytical Fluid Dynamics	
ME 709	Computational Fluid Dynamics	
ME 712	Waves in Fluids	
One approved 700-level elective, selected in consultation with the academic advisor		
<b>Total Credits</b>		<b>30-32</b>

## 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
<b>Credits</b>		<b>17</b>

### 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
<b>Credits</b>		<b>16</b>

### Second Year

Fall		
MATH 528	Multidimensional Calculus	4
MATH 644	Statistics for Engineers and Scientists	4
ME 525	Statics	4
Discovery Course		4
<b>Credits</b>		<b>16</b>

### Spring

MATH 527	Differential Equations with Linear Algebra	4
MATH 531	Mathematical Proof	4
MATH 645	Linear Algebra for Applications	4
ME 503	Thermodynamics	3
<b>Credits</b>		<b>15</b>

**Third Year****Fall**

MATH 647	Complex Analysis for Applications	4
MATH 745	Foundations of Applied Mathematics I	4
Discovery Course		4
Discovery Course		4
<b>Credits</b>		<b>16</b>

**Spring**

ME 608	Fluid Dynamics	3
ME 627	Dynamics	3
Discovery Course		4
Discovery Course		4
Writing Intensive Course		4
<b>Credits</b>		<b>18</b>

**Fourth Year****Fall**

MATH 753	Introduction to Numerical Methods I	4
ME 707	Analytical Fluid Dynamics	4
Writing Intensive Course		4
Elective Course		4
<b>Credits</b>		<b>16</b>

**Spring**

MATH 797 or MATH 798 or MATH 799	Senior Seminar or Senior Project or Senior Thesis	4
700-level ME Elective Course		4
Elective Course		4
Elective Course		4
<b>Credits</b>		<b>16</b>
<b>Total Credits</b>		<b>130</b>

## 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.