APPLIED MATHEMATICS MAJOR (B.S.)

Description
This degree prepares students for careers in science, engineering, and industry by giving students broad exposure to both theoretical and computational models of physical systems in the physical, natural, and social sciences.

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 2.0 in these courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Required MATH Courses</td>
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<tr>
<td>MATH 425</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 426</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>MATH 445</td>
<td>Mathematics and Applications with MATLAB or IAM 550</td>
<td>4</td>
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<tr>
<td>MATH 527</td>
<td>Differential Equations with Linear Algebra</td>
<td>4</td>
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<tr>
<td>MATH 528</td>
<td>Multidimensional Calculus</td>
<td>4</td>
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<tr>
<td>MATH 531</td>
<td>Mathematical Proof</td>
<td>4</td>
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<tr>
<td>MATH 545</td>
<td>Introduction to Linear Algebra or MATH 645</td>
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<tr>
<td>MATH 644</td>
<td>Statistics for Engineers and Scientists</td>
<td>4</td>
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<tr>
<td>MATH 647</td>
<td>Complex Analysis for Applications</td>
<td>4</td>
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<tr>
<td>MATH 745</td>
<td>Foundations of Applied Mathematics I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 753</td>
<td>Introduction to Numerical Methods I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 757</td>
<td>Mathematical Optimization for Applications</td>
<td>4</td>
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<td>Capstone: Select one of the following</td>
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<tr>
<td>MATH 797</td>
<td>Senior Seminar</td>
<td>4</td>
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<tr>
<td>MATH 798</td>
<td>Senior Project</td>
<td>4</td>
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<tr>
<td>MATH 799</td>
<td>Senior Thesis</td>
<td>2 or 4</td>
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<tr>
<td>Select TWO of the following electives</td>
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<tr>
<td>MATH 746</td>
<td>Foundations of Applied Mathematics II</td>
<td>4</td>
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<tr>
<td>MATH 747</td>
<td>Introduction to Nonlinear Dynamics and Chaos</td>
<td>4</td>
</tr>
<tr>
<td>MATH 767</td>
<td>One-Dimensional Real Analysis</td>
<td>4</td>
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<tr>
<td>One approved CEPS course at the 700-level, selected in consultation with the academic advisor</td>
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<tr>
<td>Other Required Courses</td>
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<tr>
<td>PHYS 407</td>
<td>General Physics I</td>
<td>4</td>
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</tbody>
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Degree Plan

Course                  Title                                               Credits
First Year
Fall
MATH 425   Calculus I                                          4
CS 415     Introduction to Computer Science I                 4
Inquiry Course                                                4
MATH 400   Freshman Seminar                                   1
Credits                                17

Spring
MATH 426   Calculus II                                         4
CS 416     Introduction to Computer Science II                4
ENGL 401   First-Year Writing                                 4
Discovery Course                                               4
Credits                                16

Second Year
Fall
MATH 445   or MATH 550 Mathematics and Applications with MATLAB or Introduction to Engineering Computing
MATH 527   Differential Equations with Linear Algebra         4
PHYS 407   General Physics I                                   4
Discovery Course                                               4
Credits                                16

Spring
MATH 528   Multidimensional Calculus                          4
MATH 531   Mathematical Proof                                 4
PHYS 408   General Physics II                                 4
Discovery Course                                               4
Credits                                16

Third Year
Fall
MATH 545   or MATH 645 Introduction to Linear Algebra or Linear Algebra for Applications
MATH 644   Statistics for Engineers and Scientists            4
MATH 753   Introduction to Numerical Methods I                4
Discovery Course                                               4
Credits                                16

1 The full Linearity sequence, MATH 525 & MATH 526, may be used to replace the MATH 527, MATH 528, and MATH 545 / MATH 645 requirements.
2 MATH 525 may be used to replace the MATH 545 or MATH 645 requirement.
Spring
MATH 757 Mathematical Optimization for Applications 4
CEPS 700-level elective 4
Discovery Course 4
Elective 4

Credits 16

Fourth Year
Fall
MATH 745 Foundations of Applied Mathematics I 4
Writing Intensive Course 4
Elective 4
Elective 4

Credits 16

Spring
MATH 647 or MATH 788 Complex Analysis for Applications or Complex Analysis 4
MATH 797 or MATH 798 or MATH 799 Senior Seminar or Senior Project or Senior Thesis 4
Writing Intensive Course 4
Elective 4

Credits 16

Total Credits 129

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.