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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 425</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 426</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<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 528</td>
<td>Multidimensional Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 531</td>
<td>Mathematical Proof</td>
<td>4</td>
</tr>
<tr>
<td>MATH 644</td>
<td>Statistics for Engineers and Scientists</td>
<td>4</td>
</tr>
<tr>
<td>MATH 645</td>
<td>Linear Algebra for Applications</td>
<td>4</td>
</tr>
<tr>
<td>MATH 753</td>
<td>Introduction to Numerical Methods I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 407</td>
<td>General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>Capstone: Select one of the following</td>
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<tr>
<td>MATH 797</td>
<td>Senior Seminar</td>
<td>4</td>
</tr>
<tr>
<td>MATH 798</td>
<td>Senior Project</td>
<td>4</td>
</tr>
<tr>
<td>MATH 799</td>
<td>Senior Thesis</td>
<td>2 or 4</td>
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<td>Total Credits</td>
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<td>50-52</td>
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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.

Computation Option Requirements

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHYS 408</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 647</td>
<td>Complex Analysis for Applications</td>
<td>4</td>
</tr>
<tr>
<td>MATH 745</td>
<td>Foundations of Applied Mathematics I</td>
<td>4</td>
</tr>
<tr>
<td>CS 415</td>
<td>Introduction to Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; CS 416</td>
<td>Introduction to Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CS 420</td>
<td>Foundations of Programming for Digital Systems</td>
<td>4</td>
</tr>
<tr>
<td>CS 515</td>
<td>Data Structures and Introduction to Algorithms</td>
<td>4</td>
</tr>
<tr>
<td>CS 659</td>
<td>Introduction to the Theory of Computation</td>
<td>4</td>
</tr>
<tr>
<td>CS 758</td>
<td>Algorithms</td>
<td>4</td>
</tr>
<tr>
<td>IAM 751</td>
<td>Introduction to High-Performance Computing</td>
<td>4</td>
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<td>Total Credits</td>
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<td>40</td>
</tr>
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</table>

Degree Plan

Course  Title  Credits
First Year
Fall
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 647 | Complex Analysis for Applications | 4
MATH 753  Introduction to Numerical Methods I  4
CS 659  Introduction to the Theory of Computation  4
Discovery Course  4

Credits  16

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  4
or Senior Project  4
or Senior Thesis  4
Discovery Course  4
Writing Intensive Course  4
Elective Course  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.