**MATHEMATICS MAJOR (B.A.)**

https://ceps.unh.edu/mathematics-statistics/program/ba/mathematics

## Description

The bachelor of arts degree with the mathematics major may offer a broader liberal arts program than the bachelor of science degree programs. By a careful selection of electives, students can shape this major into a preparation for graduate school, business, or industry.

## 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:** Yes

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</td>
<td>4</td>
</tr>
<tr>
<td>or CS 410P</td>
<td>Introduction to Scientific Programming/Python</td>
<td>4</td>
</tr>
<tr>
<td>or CS 410C</td>
<td>Introduction to Scientific Programming/C</td>
<td>4</td>
</tr>
<tr>
<td>MATH 527</td>
<td>Differential Equations with Linear Algebra</td>
<td>4</td>
</tr>
<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 539</td>
<td>Introduction to Statistical Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MATH 545</td>
<td>Introduction to Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 645</td>
<td>Linear Algebra for Applications</td>
<td>4</td>
</tr>
<tr>
<td>MATH 761</td>
<td>Abstract Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MATH 767</td>
<td>One-Dimensional Real Analysis</td>
<td>4</td>
</tr>
<tr>
<td>THREE additional approved MATH courses (selected in consultation with the academic advisor)</td>
<td>12</td>
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</tbody>
</table>

Capstone

Select one of the following:

- MATH 797 Senior Seminar
- MATH 799 Senior Thesis

### Other Required Courses

Foreign language requirement as defined by the University for all B.A. degrees.

Total Credits: 56

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MATH 525 may be used to replace the MATH 545 or MATH 645 requirement.

### Degree Plan

#### First Year

**Fall**

- MATH 425 Calculus I 4
- Language Course 4
- Discovery Course 4
- Inquiry Course 4
- MATH 400 Freshman Seminar 1

**Credits**

17

**Spring**

- MATH 426 Calculus II 4
- MATH 445 or CS 410P Mathematics and Applications with MATLAB 4
- MATH 539 Discovery to Statistical Analysis 4
- Discovery Course 4
- Discovery Course 4

**Credits**

16

#### Second Year

**Fall**

- MATH 528 Multidimensional Calculus 4
- MATH 539 Mathematical Proof 4
- MATH 545 Discovery to Statistical Analysis 4
- Discovery Course 4
- Discovery Course 4

**Credits**

16

**Spring**

- MATH 527 Differential Equations with Linear Algebra 4
- MATH 531 Mathematical Proof 4
- Discovery Course 4
- Discovery Course 4

**Credits**

16

#### Third Year

**Fall**

- MATH 545 or MATH 645 Introduction to Linear Algebra 4
- MATH 761 Abstract Algebra 4
- Discovery Course 4
- Writing Intensive Course 4

**Credits**

16

**Spring**

- MATH 767 One-Dimensional Real Analysis 4
- MATH Elective Course 4
- Discovery Course 4
- Writing Intensive Course 4

**Credits**

16
Mathematics Major (B.A.)

Fourth Year

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 797 Senior Seminar</td>
<td>4</td>
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<tr>
<td>or MATH 799 Senior Thesis</td>
<td></td>
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<tr>
<td>Elective Course</td>
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</tr>
<tr>
<td>Elective Course</td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH Elective Course</td>
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<tr>
<td>Elective Course</td>
<td>4</td>
</tr>
<tr>
<td>Elective Course</td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

Total Credits 129

Student Learning Outcomes

- Students can explain core concepts from a range of different branches of mathematics, including analysis, algebra, calculus and statistics.
- Students can correctly interpret mathematical definitions and construct simple proofs which use definitions and logical arguments to establish properties of mathematical objects.
- Students are aware that mathematical objects may have multiple representations and are able to select representations which clarify problems and simplify calculations.
- Students can recognize valid and invalid mathematical arguments.