Mathematics (B.S.)

Required course work includes the university requirements (see regulation J-3 (https://catalog.uidaho.edu/general-requirements-academic-procedures/j-general-requirements-baccalaureate-degrees/)) and:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 170</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 175</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 275</td>
<td>Calculus III</td>
<td>3</td>
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<tr>
<td>MATH 310</td>
<td>Ordinary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 330</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Options

Select one of the following options: 36-54

- General (p. 1)
- Applied - Computation (p. 1)
- Applied - Modeling and Data Science (p. 1)
- Applied - Mathematical Biology (p. 2)

Total Hours 53-71

A. General Option

This is the traditional curriculum in mathematics. It is more mathematically rigorous than the other options. It is especially good for secondary education majors and students intending to go to graduate school in mathematics or other sciences.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MATH 176</td>
<td>Discrete Mathematics</td>
<td>3</td>
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<td>MATH 215</td>
<td>Proof via Number Theory</td>
<td>3</td>
</tr>
<tr>
<td>MATH 385</td>
<td>Theory of Computation</td>
<td>3</td>
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<tr>
<td>MATH 395</td>
<td>Analysis of Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>MATH 415</td>
<td>Cryptography</td>
<td>3</td>
</tr>
<tr>
<td>MATH 428</td>
<td>Numerical Methods</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 432</td>
<td>Numerical Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 452</td>
<td>Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>or STAT 301</td>
<td>Probability and Statistics</td>
<td></td>
</tr>
</tbody>
</table>

Select two additional courses from the following: 6

- MATH 376 | Discrete Mathematics II          |       |
- MATH 426 | Discrete Optimization            |       |
- MATH 430 | Advanced Linear Algebra          |       |
- MATH 432 | Numerical Linear Algebra         |       |
- MATH 451 | Probability Theory               |       |
- MATH 452 | Mathematical Statistics          |       |
- MATH 461 | Abstract Algebra I               |       |
- MATH 462 | Abstract Algebra II              |       |
- MATH 476 | Combinatorics                    |       |

Supporting Courses

- CS 120 | Computer Science I               | 4     |
- CS 121 | Computer Science II              | 3     |

Total Hours 34

Courses to total 120 credits for this degree

B. Applied - Computation Option

The emphasis is on the mathematics related to computer science and technology. With a major or minor in computer sciences, this is a good preparation for work in the computer industry.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>MATH 183</td>
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<td>3</td>
</tr>
<tr>
<td>MATH 428</td>
<td>Numerical Methods</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 432</td>
<td>Numerical Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 451</td>
<td>Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>MATH 483</td>
<td>Foundations of Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 438</td>
<td>Mathematical Modeling</td>
<td></td>
</tr>
<tr>
<td>STAT 301</td>
<td>Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 452</td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
</tbody>
</table>

Select four additional courses from the following: 12

- CS 360 | Database Systems                |       |
- CS/MATH 385 | Theory of Computation    |       |
- CS/MATH 395 | Analysis of Algorithms      |       |
- CS 411 | Parallel Programming           |       |
- CS 415 | Computational Biology: Sequence Analysis |   |
- CS 420 | Data Communication Systems     |       |

C. Applied - Modeling and Data Science Option

The emphasis is on the mathematics used to model phenomena in engineering, science, business and economics. With a second major in one of these disciplines, this provides ideal preparation for graduate school.

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<th>Title</th>
<th>Hours</th>
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<td>MATH 176</td>
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<td>3</td>
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<tr>
<td>MATH 428</td>
<td>Numerical Methods</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 432</td>
<td>Numerical Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 451</td>
<td>Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>MATH 483</td>
<td>Foundations of Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 438</td>
<td>Mathematical Modeling</td>
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</tr>
<tr>
<td>STAT 301</td>
<td>Probability and Statistics</td>
<td>3</td>
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<tr>
<td>or MATH 452</td>
<td>Mathematical Statistics</td>
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Select four additional courses from the following: 12

- CS 360 | Database Systems                |       |
- CS/MATH 385 | Theory of Computation    |       |
- CS/MATH 395 | Analysis of Algorithms      |       |
- CS 411 | Parallel Programming           |       |
- CS 415 | Computational Biology: Sequence Analysis |   |
- CS 420 | Data Communication Systems     |       |
Mathematics (B.S.)

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<td>Data Science</td>
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<tr>
<td>MATH 371</td>
<td>Mathematical Physics</td>
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<td>MATH 376</td>
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<tr>
<td>MATH 420</td>
<td>Complex Variables</td>
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<td>MATH 428</td>
<td>Numerical Methods</td>
<td></td>
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<tr>
<td>MATH 432</td>
<td>Numerical Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 437</td>
<td>Mathematical Biology</td>
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<td>MATH 438</td>
<td>Mathematical Modeling</td>
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<tr>
<td>MATH 452</td>
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<tr>
<td>MATH 453</td>
<td>Stochastic Models</td>
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<td>MATH 476</td>
<td>Combinatorics</td>
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<tr>
<td>MATH 480</td>
<td>Partial Differential Equations</td>
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<td>MATH 483</td>
<td>Foundations of Machine Learning</td>
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<td>MIS 453</td>
<td>Database Design</td>
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<td>MIS 455</td>
<td>Data Management for Big Data</td>
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<td>ME 313</td>
<td>Dynamic Modeling of Engineering Systems</td>
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<td>SOC 417</td>
<td>Social Data Analysis</td>
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<tr>
<td>STAT 431</td>
<td>Statistical Analysis</td>
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Quantitative Electives
Select 6 credits of advisor-approved quantitative electives in Science, Engineering, Business, Economics, etc. These electives can be drawn from the above list, as long as they are not used to fulfill the elective requirement.

Total Hours 36

Courses to total 120 credits for this degree

D. Applied - Mathematical Biology Option

This option offers training across mathematics and biology and provides the background to pursue a career in technical industries and to obtain graduate degrees in biomathematics, biostatistics, and bioinformatics.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MATH 437</td>
<td>Mathematical Biology</td>
<td>3</td>
</tr>
<tr>
<td>MATH 451</td>
<td>Probability Theory</td>
<td>3</td>
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<tr>
<td>MATH 453</td>
<td>Stochastic Models</td>
<td>3</td>
</tr>
<tr>
<td>MATH 480</td>
<td>Partial Differential Equations</td>
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Select one course from the following:

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<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>MATH 428</td>
<td>Numerical Methods</td>
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<td>MATH 432</td>
<td>Numerical Linear Algebra</td>
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</table>

Select three courses from the following:

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<tr>
<td>MATH 420</td>
<td>Complex Variables</td>
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<td>MATH 430</td>
<td>Advanced Linear Algebra</td>
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<td>MATH 438</td>
<td>Mathematical Modeling</td>
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</tr>
<tr>
<td>MATH 452</td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 471</td>
<td>Introduction to Analysis I</td>
<td></td>
</tr>
<tr>
<td>MATH 472</td>
<td>Introduction to Analysis II</td>
<td></td>
</tr>
<tr>
<td>MATH 483</td>
<td>Foundations of Machine Learning</td>
<td></td>
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</table>

Biology Courses
Select 9 credits of advisor-approved electives in the biological sciences

Supporting Courses

Select one from the following

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CS 120</td>
<td>Computer Science I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 183</td>
<td>Introduction to Data Science in Python</td>
<td></td>
</tr>
<tr>
<td>STAT 419</td>
<td>Introduction to SAS/R Programming</td>
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</tr>
<tr>
<td>STAT 426</td>
<td>SAS Programming</td>
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<tr>
<td>STAT 427</td>
<td>R Programming</td>
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Total Hours 36

Courses to total 120 credits for this degree

General Option

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<th>Term</th>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Fall Term 1</td>
<td>ENGL 101</td>
<td>Writing and Rhetoric I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 143</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>COMM 101</td>
<td>Fundamentals of Oral Communication</td>
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<td></td>
<td></td>
<td>Scientific Ways of Knowing Course</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>American Diversity Course</td>
<td>3</td>
</tr>
<tr>
<td>Spring Term 1</td>
<td>ENGL 102</td>
<td>Writing and Rhetoric II</td>
<td>3</td>
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<tr>
<td></td>
<td>MATH 144</td>
<td>Precalculus II: Trigonometry</td>
<td>1</td>
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<tr>
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<td>MATH 170</td>
<td>Calculus I</td>
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<td>Humanistic and Artistic Ways of Knowing Course</td>
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<td></td>
<td></td>
<td>CS 112 OR CS 120</td>
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<tr>
<th>Term</th>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Fall Term 2</td>
<td>MATH 175</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
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<td>MATH 176</td>
<td>Discrete Mathematics</td>
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<td></td>
<td></td>
<td>International Course</td>
<td>3</td>
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<td>Social and Behavioral Ways of Knowing Course</td>
<td>3</td>
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<td></td>
<td></td>
<td>Elective Course</td>
<td>3</td>
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<tr>
<td>Spring Term 2</td>
<td>MATH 215</td>
<td>Proof via Number Theory</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 275</td>
<td>Calculus III</td>
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<td>MATH 330</td>
<td>Linear Algebra</td>
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<td>Social and Behavioral Ways of Knowing Course</td>
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<td>Scientific Ways of Knowing Course</td>
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<th>Hours</th>
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<tbody>
<tr>
<td>Fall Term 3</td>
<td>STAT 301</td>
<td>Probability and Statistics</td>
<td>3</td>
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<tr>
<td></td>
<td>MATH 310</td>
<td>Ordinary Differential Equations</td>
<td>3</td>
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<td></td>
<td>MATH 461</td>
<td>Abstract Algebra I</td>
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<td></td>
<td></td>
<td>Elective Course</td>
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<td></td>
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<td>Elective Course</td>
<td>3</td>
</tr>
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<td>Spring Term 3</td>
<td>MATH 430</td>
<td>Mathematics above 310, Major Elective Course</td>
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<td></td>
<td>MATH 452</td>
<td>Humanistic and Artistic Ways of Knowing Course</td>
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<td>MATH 453</td>
<td>Elective Course</td>
<td>3</td>
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<tr>
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<td>MATH 462</td>
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<tr>
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<td>MATH 476</td>
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<tr>
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<th>Hours</th>
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<tbody>
<tr>
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<td>3</td>
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<td></td>
<td>Mathematics above 310, Major Elective Course</td>
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**Mathematics (B.S.)**

<table>
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<tr>
<th>Term</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Fall Term 1</strong></td>
<td>16</td>
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<tr>
<td>ENGL 101</td>
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<td>Oral Communication Course</td>
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<td>Scientific Ways of Knowing Course</td>
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<td><strong>Spring Term 1</strong></td>
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<tr>
<td>CS 120</td>
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<td>ENGL 102</td>
<td>Writing and Rhetoric II</td>
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<tr>
<td>MATH 144</td>
<td>Precalculus II: Trigonometry</td>
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<tr>
<td>MATH 170</td>
<td>Calculus I</td>
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<td>Humanistic and Artistic Ways of Knowing Course</td>
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<td><strong>Fall Term 2</strong></td>
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<td>Elective Course</td>
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<tbody>
<tr>
<td><strong>Spring Term 2</strong></td>
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<tr>
<td>MATH 215</td>
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<td>4</td>
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<td>Social and Behavioral Ways of Knowing Course</td>
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<td><strong>Fall Term 3</strong></td>
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<tr>
<td>MATH 310</td>
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<td>Social and Behavioral Ways of Knowing Course</td>
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<td>MATH 395</td>
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**Total Hours** 120

**Applied - Computation Option**

<table>
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<tbody>
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<tr>
<td>ENGL 101</td>
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<td>American Diversity Course</td>
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<tr>
<td>Oral Communication Course</td>
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<td>Scientific Ways of Knowing Course</td>
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<td>Precalculus II: Trigonometry</td>
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<td>MATH 170</td>
<td>Calculus I</td>
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**Total Hours** 120

**Applied - Modeling and Data Science Option**

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Mathematics (B.S.)

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The degree map is a guide for the timely completion of your curricular requirements. Your academic advisor or department may be contacted for assistance in interpreting this map. This map is not reflective of your academic history or transcript and it is not official notification of completion of degree or certificate requirements. Please contact the Registrar’s Office regarding your official degree/certificate completion status.

1. Students should be able to think critically, apply problem solving strategies, and be able to construct and defend mathematical proofs.
2. Students should be able to use mathematical structures and the language of mathematics to formulate models for real-world problems.
3. Students should be able to effectively communicate their work and should gain experience working in collaborative settings.
4. Students should be able to interpret and extract relevant information from data using appropriate modeling techniques.