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>
</tr>
<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>
</tr>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 176</td>
<td>Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<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>
</tr>
<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

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 176</td>
<td>Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 183</td>
<td>Introduction to Data Science in Python</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 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

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.
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.

Code    Title                                    Hours
Math Courses
MATH 437  Mathematical Biology                  3
MATH 451  Probability Theory                    3
MATH 453  Stochastic Models                     3
MATH 480  Partial Differential Equations        3
Select one course from the following:          3
    MATH 428  Numerical Methods
    MATH 432  Numerical Linear Algebra
Select three courses from the following:        9
    MATH 420  Complex Variables
    MATH 430  Advanced Linear Algebra
    MATH 438  Mathematical Modeling
    MATH 452  Mathematical Statistics
    MATH 471  Introduction to Analysis I
    MATH 472  Introduction to Analysis II
    MATH 483  Foundations of Machine Learning

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

Supporting Courses
Select one from the following                          3
    CS 120  Computer Science I
    MATH 183  Introduction to Data Science in Python
    STAT 419  Introduction to SAS/R Programming
    STAT 426  SAS Programming
    STAT 427  R Programming

Total Hours                                           36

Courses to total 120 credits for this degree

General Option

Fall Term 1
ENGL 101  Writing and Rhetoric I                   3
MATH 143  College Algebra                          3
COMM 101  Fundamentals of Oral Communication       3
Scientific Ways of Knowing Course                  3
American Diversity Course                          3

Hours                                                16

Spring Term 1
ENGL 102  Writing and Rhetoric II                  3
MATH 144  Precalculus II: Trigonometry              1
MATH 170  Calculus I                               4
Humanistic and Artistic Ways of Knowing Course      3
CS 112 OR CS 120                                   3

Hours                                                14

Fall Term 2
MATH 175  Calculus II                              4
MATH 176  Discrete Mathematics                     3
International Course                               3
Social and Behavioral Ways of Knowing Course        3
Elective Course                                    3

Hours                                                15

Spring Term 2
MATH 215  Proof via Number Theory                  3
MATH 275  Calculus III                             3
MATH 330  Linear Algebra                           3
Social and Behavioral Ways of Knowing Course        3
Scientific Ways of Knowing Course                   3

Hours                                                15

Fall Term 3
STAT 301  Probability and Statistics               3
MATH 310  Ordinary Differential Equations          3
MATH 461  Abstract Algebra I                       3
Elective Course                                    3
Elective Course                                    3

Hours                                                16

Spring Term 3
Mathematics above 310, Major Elective Course        3
Humanistic and Artistic Ways of Knowing Course       3
Elective Course                                    3
Elective Course                                    3
MATH 430 OR MATH 452 OR MATH 453 OR MATH 462 OR MATH 472 OR MATH 476

Hours                                                15

Fall Term 4
MATH 415  Cryptography                             3
MATH 471  Introduction to Analysis I                3
Mathematics above 310, Major Elective Course        3
Elective Course                                    3

Hours                                                15
### Mathematics (B.S.)

<table>
<thead>
<tr>
<th>Term</th>
<th>Hours</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Term 4</td>
<td>15</td>
<td>Mathematics above 310, Major Elective Course</td>
<td>3</td>
</tr>
<tr>
<td>Spring Term 4</td>
<td>15</td>
<td>Mathematics above 310, Major Elective Course</td>
<td>3</td>
</tr>
<tr>
<td>Spring Term 4</td>
<td>15</td>
<td>Elective Course</td>
<td>3</td>
</tr>
<tr>
<td>Spring Term 4</td>
<td>15</td>
<td>Elective Course</td>
<td>3</td>
</tr>
<tr>
<td>Spring Term 4</td>
<td>15</td>
<td>Elective Course</td>
<td>2</td>
</tr>
<tr>
<td>Total Hours</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Applied - Computation Option

<table>
<thead>
<tr>
<th>Fall Term 1</th>
<th>Hours</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>3</td>
<td>Writing and Rhetoric I</td>
<td></td>
</tr>
<tr>
<td>MATH 143</td>
<td>3</td>
<td>College Algebra</td>
<td></td>
</tr>
<tr>
<td>American Diversity Course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral Communication Course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Ways of Knowing Course</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Term 1</td>
<td>16</td>
<td>Computer Science I</td>
<td></td>
</tr>
<tr>
<td>CS 120</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 102</td>
<td>3</td>
<td>Writing and Rhetoric II</td>
<td></td>
</tr>
<tr>
<td>MATH 144</td>
<td>1</td>
<td>Precalculus II: Trigonometry</td>
<td></td>
</tr>
<tr>
<td>MATH 170</td>
<td>4</td>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>Humanistic and Artistic Ways of Knowing Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Term 2</td>
<td>15</td>
<td>Computer Science II</td>
<td></td>
</tr>
<tr>
<td>CS 121</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 175</td>
<td>4</td>
<td>Calculus II</td>
<td></td>
</tr>
<tr>
<td>MATH 176</td>
<td>3</td>
<td>Discrete Mathematics</td>
<td></td>
</tr>
<tr>
<td>International Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Term 2</td>
<td>15</td>
<td>Proof via Number Theory</td>
<td></td>
</tr>
<tr>
<td>MATH 310</td>
<td>3</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 385</td>
<td>3</td>
<td>Theory of Computation</td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social and Behavioral Ways of Knowing Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Term 3</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 310</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 385</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social and Behavioral Ways of Knowing Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 452 OR STAT 301</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Term 3</td>
<td>15</td>
<td>Analysis of Algorithms</td>
<td></td>
</tr>
<tr>
<td>MATH 395</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humanistic and Artistic Ways of Knowing Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 376 OR MATH 426 OR MATH 432 OR MATH 452 OR MATH 451 OR MATH 452 OR MATH 461 OR MATH 462 OR MATH 476</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Term 4</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 415</td>
<td>3</td>
<td>Cryptography</td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Applied - Modeling and Data Science Option

<table>
<thead>
<tr>
<th>Fall Term 1</th>
<th>Hours</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>3</td>
<td>Writing and Rhetoric I</td>
<td></td>
</tr>
<tr>
<td>MATH 143</td>
<td>3</td>
<td>College Algebra</td>
<td></td>
</tr>
<tr>
<td>American Diversity Course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral Communication Course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Ways of Knowing Course</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Term 1</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 102</td>
<td>3</td>
<td>Writing and Rhetoric II</td>
<td></td>
</tr>
<tr>
<td>MATH 144</td>
<td>1</td>
<td>Precalculus II: Trigonometry</td>
<td></td>
</tr>
<tr>
<td>MATH 170</td>
<td>4</td>
<td>Calculus I</td>
<td></td>
</tr>
<tr>
<td>Humanistic and Artistic Ways of Knowing Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Term 2</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 175</td>
<td>4</td>
<td>Calculus II</td>
<td></td>
</tr>
<tr>
<td>MATH 176</td>
<td>3</td>
<td>Discrete Mathematics</td>
<td></td>
</tr>
<tr>
<td>Social and Behavioral Ways of Knowing Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Term 2</td>
<td>15</td>
<td>Introduction to Data Science in Python</td>
<td></td>
</tr>
<tr>
<td>MATH 183</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 275</td>
<td>3</td>
<td>Calculus III</td>
<td></td>
</tr>
<tr>
<td>MATH 330</td>
<td>3</td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social and Behavioral Ways of Knowing Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Term 3</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 310</td>
<td>3</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 451</td>
<td>3</td>
<td>Probability Theory</td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics, Major Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Term 3</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH elec, or Senior Exp., Major Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modeling, Major Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humanistic and Artistic Ways of Knowing Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 452 OR STAT 301</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Term 4</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modeling, Major Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH elective or Senior Exp., Major Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics, Major Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mathematics (B.S.)

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Term 4</td>
<td>MATH 438 OR MATH 483</td>
<td>Mathematics, Major Elective Course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td></td>
<td>120</td>
</tr>
</tbody>
</table>

Applied - Mathematical Biology Option

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<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>BIOL 114</td>
<td>Organisms and Environments</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>COMM 101</td>
<td>Fundamentals of Oral Communication</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>American Diversity Course</td>
<td>2</td>
</tr>
<tr>
<td>Hours</td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Fall Term 2</td>
<td>MATH 175</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>BIOL 115</td>
<td>Cells and the Evolution of Life</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BIOL 115L</td>
<td>Cells and the Evolution of Life Laboratory</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Social and Behavioral Ways of Knowing Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Fall Term 3</td>
<td>MATH 275</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 330</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanistic and Artistic Ways of Knowing Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UPDV Biology, Major Elective Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STAT 251 OR STAT 301</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Fall Term 4</td>
<td>BIOL 310</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 451</td>
<td>Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elective Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MATH 310 OR MATH 453 OR STAT 431</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Spring Term 3</td>
<td>MATH 437</td>
<td>Mathematical Biology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 452</td>
<td>Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>UPDV Biology, Major Elective Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social and Behavioral Ways of Knowing Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elective Course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Spring Term 4</td>
<td>MATH 428 OR MATH 430 OR MATH 480</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td></td>
<td>120</td>
</tr>
</tbody>
</table>

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.