

# 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:

Code	Title	Hours
MATH 170	Calculus I	4
MATH 175	Calculus II	4
MATH 275	Calculus III	3
MATH 310	Ordinary Differential Equations	3
MATH 330	Linear Algebra	3
<b>Options</b>		
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)		
<b>Total Hours</b>		<b>53-71</b>

## 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.

Code	Title	Hours
<b>Math Courses</b>		
MATH 176	Discrete Mathematics	3
MATH 215	Proof via Number Theory	3
MATH 461	Abstract Algebra I	3
MATH 471	Introduction to Analysis I	3
Select one of the following:		3
MATH 430	Advanced Linear Algebra	
MATH 452	Mathematical Statistics	
MATH 453	Stochastic Models	
MATH 462	Abstract Algebra II	
MATH 472	Introduction to Analysis II	
MATH 476	Combinatorics	
Select four math courses above 310		12
<b>Supporting Courses</b>		
STAT 301	Probability and Statistics	3
CS 112	Computational Thinking and Problem Solving	3
or CS 120	Computer Science I	
<b>Total Hours</b>		<b>33</b>

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.

Code	Title	Hours
<b>Math Courses</b>		
MATH 176	Discrete Mathematics	3
MATH 215	Proof via Number Theory	3
MATH 385	Theory of Computation	3
MATH 395	Analysis of Algorithms	3
MATH 415	Cryptography	3
MATH 428	Numerical Methods	3
or MATH 432	Numerical Linear Algebra	
MATH 452	Mathematical Statistics	3
or STAT 301	Probability and Statistics	
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	
<b>Supporting Courses</b>		
CS 120	Computer Science I	4
CS 121	Computer Science II	3
<b>Total Hours</b>		<b>34</b>

Courses to total 120 credits for this degree

## 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.

Code	Title	Hours
<b>Math Courses</b>		
MATH 176	Discrete Mathematics	3
MATH 183	Introduction to Data Science in Python	3
MATH 428	Numerical Methods	3
or MATH 432	Numerical Linear Algebra	
MATH 451	Probability Theory	3
MATH 483	Foundations of Machine Learning	3
or MATH 438	Mathematical Modeling	
STAT 301	Probability and Statistics	3
or MATH 452	Mathematical Statistics	
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	

CS 470	Artificial Intelligence
CS 479	Data Science
MATH 371	Mathematical Physics
MATH 376	Discrete Mathematics II
MATH 420	Complex Variables
MATH 428	Numerical Methods
MATH 432	Numerical Linear Algebra
MATH 437	Mathematical Biology
MATH 438	Mathematical Modeling
MATH 452	Mathematical Statistics
MATH 453	Stochastic Models
MATH 476	Combinatorics
MATH 480	Partial Differential Equations
MATH 483	Foundations of Machine Learning
MIS 453	Database Design
MIS 455	Data Management for Big Data
ME 313	Dynamic Modeling of Engineering Systems
SOC 417	Social Data Analysis
STAT 431	Statistical Analysis

**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. 6

**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.

Code	Title	Hours
<b>Math Courses</b>		
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 9

**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	Hours	
ENGL 101	Writing and Rhetoric I	3
MATH 143	College Algebra	3
COMM 101	Fundamentals of Oral Communication	3
Scientific Ways of Knowing Course		4
American Diversity Course		3
<b>Hours</b>		<b>16</b>
<b>Spring Term 1</b>		
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
<b>Hours</b>		<b>14</b>
<b>Fall Term 2</b>		
MATH 175	Calculus II	4
MATH 176	Discrete Mathematics	3
International Course		3
Social and Behavioral Ways of Knowing Course		3
Elective Course		2
<b>Hours</b>		<b>15</b>
<b>Spring Term 2</b>		
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		4
<b>Hours</b>		<b>16</b>
<b>Fall Term 3</b>		
STAT 301	Probability and Statistics	3
MATH 310	Ordinary Differential Equations	3
MATH 461	Abstract Algebra I	3
Elective Course		3
Elective Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 3</b>		
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		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
MATH 415	Cryptography	3
MATH 471	Introduction to Analysis I	3
Mathematics above 310, Major Elective Course		3
Elective Course		3

Elective Course	3
<b>Hours</b>	<b>15</b>
<b>Spring Term 4</b>	
Mathematics above 310, Major Elective Course	3
Mathematics above 310, Major Elective Course	3
Elective Course	3
Elective Course	3
Elective Course	2
<b>Hours</b>	<b>14</b>
<b>Total Hours</b>	<b>120</b>

### Applied - Computation Option

<b>Fall Term 1</b>		<b>Hours</b>
ENGL 101	Writing and Rhetoric I	3
MATH 143	College Algebra	3
American Diversity Course		3
Oral Communication Course		3
Scientific Ways of Knowing Course		4
<b>Hours</b>		<b>16</b>
<b>Spring Term 1</b>		
CS 120	Computer Science I	4
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
<b>Hours</b>		<b>15</b>
<b>Fall Term 2</b>		
CS 121	Computer Science II	3
MATH 175	Calculus II	4
MATH 176	Discrete Mathematics	3
International Course		3
Elective Course		2
<b>Hours</b>		<b>15</b>
<b>Spring Term 2</b>		
MATH 215	Proof via Number Theory	3
MATH 275	Calculus III	3
MATH 330	Linear Algebra	3
Scientific Ways of Knowing Course		4
Social and Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>16</b>
<b>Fall Term 3</b>		
MATH 310	Ordinary Differential Equations	3
MATH 385	Theory of Computation	3
Elective Course		3
Social and Behavioral Ways of Knowing Course		3
MATH 452 OR STAT 301		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 3</b>		
MATH 395	Analysis of Algorithms	3
Humanistic and Artistic Ways of Knowing Course		3
Elective Course		3
Elective Course		3
MATH 376 OR MATH 426 OR MATH 430 OR MATH 432 OR MATH 451 OR MATH 452 OR MATH 461 OR MATH 462 OR MATH 476		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
MATH 415	Cryptography	3
Elective Course		3
Elective Course		3
Elective Course		3

MATH 376 OR MATH 426 OR MATH 432 OR MATH 451 OR MATH 452 OR MATH 461 OR MATH 462 OR MATH 476	3
<b>Hours</b>	<b>15</b>
<b>Spring Term 4</b>	
Elective Course	3
Elective Course	3
Elective Course	3
1 credit Elective Course	1
MATH 428 OR MATH 432	3
<b>Hours</b>	<b>13</b>
<b>Total Hours</b>	<b>120</b>

### Applied - Modeling and Data Science Option

<b>Fall Term 1</b>		<b>Hours</b>
ENGL 101	Writing and Rhetoric I	3
MATH 143	College Algebra	3
American Diversity Course		3
Oral Communication Course		3
Scientific Ways of Knowing Course		4
<b>Hours</b>		<b>16</b>
<b>Spring Term 1</b>		
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
Scientific Ways of Knowing Course		4
<b>Hours</b>		<b>15</b>
<b>Fall Term 2</b>		
MATH 175	Calculus II	4
MATH 176	Discrete Mathematics	3
Social and Behavioral Ways of Knowing Course		3
International Course		3
Elective Course		2
<b>Hours</b>		<b>15</b>
<b>Spring Term 2</b>		
MATH 183	Introduction to Data Science in Python	3
MATH 275	Calculus III	3
MATH 330	Linear Algebra	3
Elective Course		3
Social and Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 3</b>		
MATH 310	Ordinary Differential Equations	3
MATH 451	Probability Theory	3
Elective Course		3
Elective Course		3
Mathematics, Major Elective Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 3</b>		
MATH elec, or Senior Exp., Major Elective Course		3
Modeling, Major Elective Course		3
Humanistic and Artistic Ways of Knowing Course		3
Elective Course		3
MATH 452 OR STAT 301		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
Modeling, Major Elective Course		3
MATH elective or Senior Exp., Major Elective Course		3
Mathematics, Major Elective Course		3
Elective Course		3

MATH 438 OR MATH 483	3
<b>Hours</b>	<b>15</b>
<b>Spring Term 4</b>	
Mathematics, Major Elective Course	3
Mathematics, Major Elective Course	3
Elective Course	3
Elective Course	2
MATH 428 OR MATH 432	3
<b>Hours</b>	<b>14</b>
<b>Total Hours</b>	<b>120</b>

MATH 428 OR MATH 430 OR MATH 480	3
<b>Hours</b>	<b>15</b>
<b>Spring Term 4</b>	
UPDV Biology, Elective Course	3
Elective Course	3
Elective Course	3
MATH 310 OR MATH 453 OR STAT 431	3
MATH 428 OR MATH 430 OR MATH 480	3
<b>Hours</b>	<b>15</b>
<b>Total Hours</b>	<b>120</b>

## Applied - Mathematical Biology Option

<b>Fall Term 1</b>		<b>Hours</b>
ENGL 101	Writing and Rhetoric I	3
MATH 143	College Algebra	3
BIOL 114	Organisms and Environments	4
COMM 101	Fundamentals of Oral Communication	3
American Diversity Course		3
<b>Hours</b>		<b>16</b>
<b>Spring Term 1</b>		
ENGL 102	Writing and Rhetoric II	3
MATH 144	Precalculus II: Trigonometry	1
MATH 170	Calculus I	4
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Laboratory	1
Humanistic and Artistic Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 2</b>		
MATH 175	Calculus II	4
BIOL 115	Cells and the Evolution of Life	3
BIOL 115L	Cells and the Evolution of Life Laboratory	1
Social and Behavioral Ways of Knowing Course		3
International Course		3
<b>Hours</b>		<b>14</b>
<b>Spring Term 2</b>		
MATH 275	Calculus III	3
MATH 330	Linear Algebra	3
Humanistic and Artistic Ways of Knowing Course		3
UPDV Biology, Major Elective Course		3
STAT 251 OR STAT 301		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 3</b>		
BIOL 310	Genetics	3
MATH 451	Probability Theory	3
Elective Course		3
Elective Course		3
MATH 310 OR MATH 453 OR STAT 431		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 3</b>		
MATH 437	Mathematical Biology	3
MATH 452	Mathematical Statistics	3
UPDV Biology, Major Elective Course		3
Social and Behavioral Ways of Knowing Course		3
Elective Course		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
BIOL 456	Computer Skills for Biologists	3
MATH 415	Cryptography	3
UPDV Biology, Major Elective Course		3
Elective Course		3

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.