

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 |
| 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.

| Code | Title | Hours |
|------------------------------------|--|-----------|
| Math Courses | | |
| 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 |
| Supporting Courses | | |
| STAT 301 | Probability and Statistics | 3 |
| CS 112 | Computational Thinking and Problem Solving | 3 |
| or CS 120 | Computer Science I | |
| Total Hours | | 33 |

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 |
|---|----------------------------|-----------|
| Math Courses | | |
| 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 | |
| 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

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 |
|--|--|-------|
| Math Courses | | |
| 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 | |

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| 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.

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 |
|--|---------------------------------|-------|
| 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 | | 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 |
| 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 | | 2 |
| 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 | | 4 |
| Hours | | 16 |
| 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 | | 15 |
| 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 | | 3 |
| 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 |

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| Elective Course | 3 |
| Hours | 15 |
| Spring Term 4 | |
| Mathematics above 310, Major Elective Course | 3 |
| Mathematics above 310, Major Elective Course | 3 |
| Elective Course | 3 |
| Elective Course | 3 |
| Elective Course | 2 |
| Hours | 14 |
| Total Hours | 120 |

Applied - Computation Option

| | | |
|--|---------------------------------|--------------|
| Fall Term 1 | | Hours |
| 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 |
| Hours | | 16 |
| Spring Term 1 | | |
| 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 |
| Hours | | 15 |
| Fall Term 2 | | |
| CS 121 | Computer Science II | 3 |
| MATH 175 | Calculus II | 4 |
| MATH 176 | Discrete Mathematics | 3 |
| International Course | | 3 |
| Elective Course | | 2 |
| Hours | | 15 |
| Spring Term 2 | | |
| 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 |
| Hours | | 16 |
| Fall Term 3 | | |
| 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 |
| Hours | | 15 |
| Spring Term 3 | | |
| 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 |
| Hours | | 15 |
| Fall Term 4 | | |
| MATH 415 | Cryptography | 3 |
| Elective Course | | 3 |
| Elective Course | | 3 |
| Elective Course | | 3 |

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

Applied - Modeling and Data Science Option

| | | |
|---|--|--------------|
| Fall Term 1 | | Hours |
| 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 |
| 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 |
| Scientific Ways of Knowing Course | | 4 |
| Hours | | 15 |
| Fall Term 2 | | |
| MATH 175 | Calculus II | 4 |
| MATH 176 | Discrete Mathematics | 3 |
| Social and Behavioral Ways of Knowing Course | | 3 |
| International Course | | 3 |
| Elective Course | | 2 |
| Hours | | 15 |
| Spring Term 2 | | |
| 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 |
| Hours | | 15 |
| Fall Term 3 | | |
| MATH 310 | Ordinary Differential Equations | 3 |
| MATH 451 | Probability Theory | 3 |
| Elective Course | | 3 |
| Elective Course | | 3 |
| Mathematics, Major Elective Course | | 3 |
| Hours | | 15 |
| Spring Term 3 | | |
| 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 |
| Hours | | 15 |
| Fall Term 4 | | |
| Modeling, Major Elective Course | | 3 |
| MATH elective or Senior Exp., Major Elective Course | | 3 |
| Mathematics, Major Elective Course | | 3 |
| Elective Course | | 3 |

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

Applied - Mathematical Biology Option

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|--|--------------|
| Fall Term 1 | Hours |
| 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 |
| Hours | 16 |
| Spring Term 1 | |
| 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 |
| Hours | 15 |
| Fall Term 2 | |
| 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 |
| Hours | 14 |
| Spring Term 2 | |
| 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 |
| Hours | 15 |
| Fall Term 3 | |
| BIOL 310 Genetics | 3 |
| MATH 451 Probability Theory | 3 |
| Elective Course | 3 |
| Elective Course | 3 |
| MATH 310 OR MATH 453 OR STAT 431 | 3 |
| Hours | 15 |
| Spring Term 3 | |
| 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 |
| Hours | 15 |
| Fall Term 4 | |
| BIOL 456 Computer Skills for Biologists | 3 |
| MATH 415 Cryptography | 3 |
| UPDV Biology, Major Elective Course | 3 |
| Elective Course | 3 |

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| MATH 428 OR MATH 430 OR MATH 480 | 3 |
| Hours | 15 |
| Spring Term 4 | |
| 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 |
| Hours | 15 |
| Total Hours | 120 |

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.