Bachelor of Science in Mathematics

The Bachelor of Science (BS) in Mathematics prepares students for careers in academia, technology, business and the sciences. In addition to a strong mathematics core curriculum, this degree offers the opportunity to explore how mathematics is applied through concentrations in statistics, finance, physics, computer science, pre-data science, or another approved discipline as a bridge to a future career.

Admission Requirements

- Complete the Admission Requirements for Baccalaureate Degrees (https://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/undergraduate/).

Graduation Requirements

- Complete the General University Requirements for Baccalaureate Degrees (http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/).
- Complete the General Education Requirements for Baccalaureate Degrees (http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/gers/).
- Take a standardized test of knowledge of mathematics approved by the mathematics faculty for the purpose of evaluating program effectiveness. There is no minimum score required for graduation. This test will normally be taken during the senior year.
- Complete a portfolio demonstrating their mathematics knowledge. There is no grade for this requirement. The portfolio will normally be submitted in the semester of graduation.
- Complete the following major requirements:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH A251</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH A252</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH A253</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH A264</td>
<td>Introduction to the Mathematics Major</td>
<td>1</td>
</tr>
<tr>
<td>MATH A265</td>
<td>Fundamentals of Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH A306</td>
<td>Discrete Methods</td>
<td>3</td>
</tr>
<tr>
<td>MATH A314</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH A401</td>
<td>Introduction to Real Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH A405</td>
<td>Introduction to Abstract Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Analysis and Topology

Select one of the following:

- MATH A410 Introduction to Complex Analysis
- MATH A430 Concepts of Topology
- MATH A431 Introduction to Differential Geometry

Applied Math

Select one of the following:

- MATH A302 Ordinary Differential Equations
- MATH A432 Partial Differential Equations
- MATH A426 Numerical Analysis
- PHYS A456 Nonlinear Dynamics and Chaos

Statistics

Select one of the following:

- MATH A371 Stochastic Processes
- MATH A407 Mathematical Statistics
- STAT A307 Probability and Statistics
- STAT A308 Intermediate Statistics for the Sciences
- STAT A402 Scientific Sampling
- STAT A403 Regression Analysis
- STAT A404 Analysis of Variance
- STAT A407 Time Series Analysis
- STAT A408 Multivariate Statistics
- STAT A410 Statistical Methods

Other Mathematics Course

Select one of the following:

- MATH A305 Introduction to Geometries
- MATH A309 Introduction to Number Theory
- MATH A420 Historical Mathematics
- MATH A490 Selected Topics in Mathematics

Select 6 additional credits from the four categories above.

Select from one of the following options:

Option 1: Statistics (12 credits)
Complete 12 additional credits not already selected from the statistics list above

Option 2: Physics (14 credits)

- PHYS A211 General Physics I
- PHYS A211L General Physics I Laboratory
- PHYS A212 General Physics II
- PHYS A212L General Physics II Laboratory

Complete 6 additional credits of PHYS courses at the 300-level or higher

Option 3: Computer Science (16 credits)

- CSCE A101 Introduction to Computer Science
- CSCE A201 Computer Programming I

Complete 9 additional credits of CSCE courses at the 200-level or higher

Option 4: Finance (18 credits)

- BA A325 Corporate Finance
- CIS A110 Computer Concepts in Business
- ECON A227 Introductory Statistics for Economics and Business

Complete 9 credits of upper-division finance courses from the list below:
Bachelor of Science in Mathematics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA A380</td>
<td>Investment Management</td>
</tr>
<tr>
<td>BA A385</td>
<td>Intermediate Financial Management</td>
</tr>
<tr>
<td>BA A427</td>
<td>International Finance</td>
</tr>
<tr>
<td>BA A451</td>
<td>Advanced Investment Strategies</td>
</tr>
<tr>
<td>BA A452</td>
<td>Financial Derivatives</td>
</tr>
</tbody>
</table>

**Option 5: Pre-Data Science (20 credits)**

- CSCE A101 Introduction to Computer Science
- CSCE A201 Computer Programming I
- CSCE A211 Computer Programming II
- CSCE A311 Data Structures and Algorithms
- CSCE A360 Database Systems

Complete one of the following courses not already selected from a list above:

- CSCE A415 Machine Learning
- CSCE A462 Data Mining
- STAT A407 Time Series Analysis
- STAT A408 Multivariate Statistics

**Option 6: Concentration in another discipline involving mathematics (15 credits)**

Complete 15 credits from a departmentally-approved list, of which 6 credits must be upper-division.

**Mathematics Capstone Experience**

Select from one of the following options.

- MATH A495A Mathematics Practicum
- MATH A495B Mathematics or Statistics Internship
- MATH A496 Advanced Readings in Mathematics
- MATH A498 Individual Research

Total 59-68

---

1. A maximum of 6 credits of MATH A490, MATH A495A, MATH A495B, MATH A496 and MATH A498 may be applied to the degree requirements.

2. If completing Option 5 (Pre-Data Science), STAT A307 is required to complete the Statistics degree requirement, STAT A308 is required to complete the "Other Mathematics Course" requirement (this course is not listed above because it is not a choice for students pursuing other Options), and STAT A402 and STAT A403 are required to complete the 6 additional credits requirement.

3. Completion of Option 6 requires consultation with an advisor and a proposal for the choice of discipline and courses that is subject to approval by the Department of Mathematics & Statistics. Students considering Option 6 should be aware that additional prerequisites for courses that are accepted for Option 6 may result in a total credit count that exceeds 15 credits.

---

Honors in Mathematics

The Bachelor of Science (BS) in Mathematics recognizes distinguished achievement by conferring programmatic honors in mathematics. In order to receive honors in mathematics, a student must meet the following requirements:

- Meet the requirements for Graduation with Honors (http://catalog.uaa.alaska.edu/academicpoliciesprocesses/academicstandardsregulations/graduation/) as outlined in the catalog;
- Meet the requirements for a BS in Mathematics;
- Earn a minimum cumulative GPA of 3.50 in the major requirements;
- Complete a minimum of 12 upper-division credits required for the major in residence.

A minimum of 120 credits is required for the degree, of which 39 credits must be upper-division.