Bachelor of Science in Mathematics

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: 3

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

Applied Math

Select one of the following: 3

- 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: 3

- 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 Courses

Select one of the following: 3

- 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: 12-18

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

Option 2: 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 3: 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 upper-division PHYS courses at the 300-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:

BA A380 Investment Management
BA A385 Intermediate Financial Management
BA A427 International Finance
BA A451 Advanced Investment Strategies
BA A452 Financial Derivatives

Mathematics Capstone Experience 1
Select from one of the following options.

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH A495A</td>
<td>Mathematics Practicum</td>
</tr>
<tr>
<td>MATH A495B</td>
<td>Mathematics or Statistics Internship</td>
</tr>
<tr>
<td>MATH A496</td>
<td>Advanced Readings in Mathematics</td>
</tr>
<tr>
<td>MATH A498</td>
<td>Individual Research</td>
</tr>
</tbody>
</table>

Total 59-66

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

A minimum of 120 credits is required for the degree, of which 42 credits must be upper-division.

**Honors in Mathematics**

The Bachelor of Science 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/).
- Meet the requirements for a BA/BS in Mathematics.
- Earn a cumulative grade point average of 3.50 or above in the major requirements.
- Complete a minimum of 12 upper-division credits required for the major in residence.

**Program Student Learning Outcomes**

Students graduating with a Bachelor of Science in Mathematics will be able to:

- Demonstrate knowledge of the techniques of modern mathematical subjects including all of algebra, analysis, discrete mathematics, and probability and statistics.
- Demonstrate an ability to solve problems using skills such as deductive logic, data analysis, computation, modeling, connections, and other mathematical techniques.
- Demonstrate an ability to create mathematical proofs.
- Demonstrate an ability to read, write, and speak about mathematics.
- Demonstrate cognizance of their mathematical knowledge, of mathematics around them, and of the benefit of continued study of mathematics.
- Demonstrate an understanding of the connections between mathematics and another discipline relying significantly on mathematics and recognize mathematical ideas embedded in other contexts.