

# MATHEMATICS B.S.

## Program Requirements

< Back to Department (<https://catalog.uaf.edu/academic-departments/mathematics-statistics/>)

## Minimum Requirements for Mathematics B.S.: 120 credits

### CONCENTRATIONS: MATHEMATICS (P. 1), STATISTICS (P. 2)

Students must earn a C- grade or better in each course.

Code	Title	Credits
<b>Pre-major Requirement</b>		
Students must be ready to matriculate into MATH F251X before they will be allowed to declare mathematics as their major.		
<b>General University Requirements</b>		
Complete the general university requirements. ( <a href="https://catalog.uaf.edu/bachelors/#gurbachelorsdegreestext">https://catalog.uaf.edu/bachelors/#gurbachelorsdegreestext</a> )		
<b>General Education Requirements</b>		
Complete the general education requirements. ( <a href="https://catalog.uaf.edu/bachelors/#generaleducationrequirementstext">https://catalog.uaf.edu/bachelors/#generaleducationrequirementstext</a> )		36-40
As part of the general education requirements, complete the following:		
MATH F251X	Calculus I	
<b>B.S. Degree Requirements</b>		
Complete the B.S. degree requirements. ( <a href="https://catalog.uaf.edu/bachelors/#bachelorofsciencetext">https://catalog.uaf.edu/bachelors/#bachelorofsciencetext</a> )		16
As part of the B.S. requirements, complete the following:		
MATH F252X	Calculus II	
PHYS F123X	College Physics I	
and PHYS F124X	and College Physics II	
or PHYS F211X	General Physics I	
and PHYS F212X	and General Physics II	
<b>Mathematics Program Requirements</b>		
Complete the following:		
MATH F253X	Calculus III	4
MATH F265	Introduction to Mathematical Proofs	3
MATH F314	Linear Algebra	3
<b>Concentration</b>		
Complete one of the following:		29-30
Mathematics		
Statistics		
<b>Electives</b>		
General Electives		24-29
<b>Total Credits</b>		<b>120</b>

**Note:** All mathematics majors – including double majors – must have an advisor from the Department of Mathematics and Statistics.

**Note:** At least 12 approved mathematics credits at the F300 level or above must be taken while in residence on the Fairbanks campus.

## Concentrations MATHEMATICS

Code	Title	Credits
<b>Mathematics Concentration Requirements</b>		
Complete the following:		
MATH F401	Introduction to Real Analysis	3
MATH F405	Abstract Algebra	3
MATH F490	Senior Seminar <sup>1</sup>	3
Complete at least 21 additional credits of electives. <sup>2</sup>		21
<b>Total Credits</b>		<b>30</b>

<sup>1</sup> Fulfills the baccalaureate capstone requirement.

<sup>2</sup> Acceptable elective courses include any math or statistics course at the F300 level or above and CS F201. At least 15 credits must be math courses. In some cases, courses with strong mathematical content from other disciplines may be used as electives. Such an elective must be approved by an advisor in the Department of Mathematics and Statistics. The requirement that at least 15 credits be math courses still applies.

### Suggested Elective Packages for Mathematics Concentration Pure Mathematics Suggested Electives

Code	Title	Credits
Complete the following:		
MATH F305	Geometry	3
MATH F320	Topics in Combinatorics	3
or MATH F321	Number Theory	
MATH F404	Introduction to Topology	3
MATH F410	Introduction to Complex Analysis	3
Additional 9 elective credits <sup>3</sup>		9
<b>Total Credits</b>		<b>21</b>

<sup>3</sup> Acceptable elective courses include any math or statistics course at the F300 level or above and CS F201. In some cases, courses with strong mathematical content from other disciplines may be used as electives. Such an elective must be approved by an advisor in the Department of Mathematics and Statistics.

### Applied Mathematics Suggested Electives

Code	Title	Credits
Complete the following:		
MATH F302	Differential Equations	3
MATH F410	Introduction to Complex Analysis	3
MATH F432	Introduction to Partial Differential Equations	3
MATH F460	Mathematical Modeling	3
Complete two of the following:		6
MATH F307	Discrete Mathematics	
MATH F426	Numerical Analysis	
STAT F300	Statistics	
Additional 3 elective credits		3
<b>Total Credits</b>		<b>21</b>

**Mathematics Teachers (Grades 7-12) Suggested Electives**<sup>4</sup>

Code	Title	Credits
Complete the following:		
CS F201	Computer Science I	3
MATH F305	Geometry	3
MATH F316	Introduction to the History of Mathematics	3
STAT F300	Statistics	3
or MATH F371	Probability	
or MATH F408	Mathematical Statistics	
Complete one of the following:		3
MATH F307	Discrete Mathematics	
MATH F320	Topics in Combinatorics	
MATH F321	Number Theory	
Complete two of the following:		6
MATH F302	Differential Equations	
MATH F410	Introduction to Complex Analysis	
MATH F426	Numerical Analysis	
MATH F432	Introduction to Partial Differential Equations	
MATH F460	Mathematical Modeling	
<b>Total Credits</b>		<b>21</b>

<sup>4</sup> We strongly recommend that prospective secondary science teachers seek advising from the UAF School of Education early in their undergraduate degree program so that they can be appropriately advised of the State of Alaska requirements for teacher licensure. Students may choose to pursue a double major with education or complete a postbaccalaureate teacher certification program.

**STATISTICS**

Code	Title	Credits
<b>Statistics Concentration Requirements</b>		
Complete the following:		
CS F201	Computer Science I	3
or NRM F338	Introduction to Geographic Information Systems	
ENGL F314	Technical Writing	3
or ENGL F414	Research Writing	
MATH F371	Probability	3
MATH F401	Introduction to Real Analysis	3
or MATH F405	Abstract Algebra	
MATH F408	Mathematical Statistics	3
STAT F300	Statistics	3
STAT F401	Regression and Analysis of Variance	4
STAT F402	Scientific Sampling	3
STAT F454	Statistical Consulting Seminar <sup>1</sup>	1
Additional 3 elective credits at the F300 level or above <sup>3</sup>		3
<b>Total Credits</b>		<b>29</b>

<sup>1</sup> Fulfills the baccalaureate capstone requirement.

<sup>3</sup> Acceptable elective courses include any MATH or STAT course at the F300 level or above. In some cases, courses with strong mathematical content from other disciplines may be used as electives. Such

an elective must be approved by an advisor in the Department of Mathematics and Statistics.

**Road Maps**

< Back to Department (<https://catalog.uaf.edu/academic-departments/mathematics-statistics/>)

Road Maps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Some courses and milestones must be completed in the semester listed to ensure timely graduation. Transfer credit may change the road map.

This road map should be used in conjunction with regular academic advising appointments. All students are encouraged to meet with their advisor or mentor each semester. Requirements, course availability and sequencing are subject to change.

**MATHEMATICS B.S. WITH MATHEMATICS CONCENTRATION**

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MATH F251X	Calculus I	4
GER (Art)		3
GER (Lab Science I)		4
GER (WRTG)		3
Elective		3
<b>Credits</b>		<b>17</b>
<b>Spring</b>		
LS F101X	Library Information and Research	1
MATH F252X	Calculus II	4
MATH F265	Introduction to Mathematical Proofs	3
GER (Social Science I)		3
GER (WRTG)		3
<b>Credits</b>		<b>14</b>
<b>Second Year</b>		
<b>Fall</b>		
MATH F253X	Calculus III	4
MATH F314	Linear Algebra	3
PHYS F211X	General Physics I	4
GER (Humanities)		3
<b>Credits</b>		<b>14</b>
<b>Spring</b>		
PHYS F212X	General Physics II	4
Math Elective		3
Math Elective		3
GER (COM)		3
Elective		3
<b>Credits</b>		<b>16</b>
<b>Third Year</b>		
<b>Fall</b>		
MATH F401	Introduction to Real Analysis	3
Math Elective		3
GER (Social Science I)		3

ANT Course		3
Elective		3
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
MATH F405	Abstract Algebra	3
Math Elective		3
GER (Art/Social Science/Humanities)		3
Ethics Course		3
Elective		3
<b>Credits</b>		<b>15</b>
<b>Fourth Year</b>		
<b>Fall</b>		
Math Elective		3
Math Elective		3
GER (Lab Science II)		4
Elective		3
Elective		3
<b>Credits</b>		<b>16</b>
<b>Spring</b>		
MATH F490	Senior Seminar	3
Math Elective		3
Elective		3
Elective		3
Elective		3
<b>Credits</b>		<b>15</b>
<b>Total Credits</b>		<b>122</b>

**MATHEMATICS B.S. WITH STATISTICS CONCENTRATION - ODD YEAR START**

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MATH F251X	Calculus I	4
GER (Art)		3
GER (Lab Science I)		4
GER (WRTG)		3
<b>Credits</b>		<b>14</b>
<b>Spring</b>		
MATH F252X	Calculus II	4
MATH F265	Introduction to Mathematical Proofs	3
GER (Social Science I)		3
GER (WRTG)		3
<b>Credits</b>		<b>13</b>
<b>Second Year</b>		
<b>Fall</b>		
MATH F253X	Calculus III	4
MATH F314	Linear Algebra	3
PHYS F211X	General Physics I	4
GER (Humanities)		3
<b>Credits</b>		<b>14</b>

<b>Spring</b>		
CS F201 or NRM F338	Computer Science I or Introduction to Geographic Information Systems	3
PHYS F212X	General Physics II	4
STAT F300	Statistics	3
GER (COM)		3
<b>Credits</b>		<b>13</b>

<b>Third Year</b>		
<b>Fall</b>		
MATH F371	Probability	3
STAT F402	Scientific Sampling	3
GER (Social Science I)		3
ANT Course		3
<b>Credits</b>		<b>12</b>

<b>Spring</b>		
MATH F408	Mathematical Statistics	3
STAT F401	Regression and Analysis of Variance	4
GER (Art/Social Science/Humanities)		3
Ethics Course		3
<b>Credits</b>		<b>13</b>

<b>Fourth Year</b>		
<b>Fall</b>		
ENGL F314 or ENGL F414	Technical Writing or Research Writing	3
MATH F401	Introduction to Real Analysis	3
GER (Lab Science II)		4
<b>Credits</b>		<b>10</b>

<b>Spring</b>		
LS F101X	Library Information and Research	1
STAT F454	Statistical Consulting Seminar	1
Stat or Math Elective		3
<b>Credits</b>		<b>5</b>
<b>Total Credits</b>		<b>94</b>

**MATHEMATICS B.S. WITH STATISTICS CONCENTRATION - EVEN YEAR START**

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MATH F251X	Calculus I	4
GER (Art)		3
GER (Lab Science I)		4
GER (WRTG)		3
<b>Credits</b>		<b>14</b>
<b>Spring</b>		
MATH F252X	Calculus II	4
MATH F265	Introduction to Mathematical Proofs	3
GER (Social Science I)		3
GER (WRTG)		3
<b>Credits</b>		<b>13</b>

**Second Year****Fall**

MATH F253X	Calculus III	4
MATH F314	Linear Algebra	3
PHYS F211X	General Physics I	4
GER (Humanities)		3

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<b>Credits</b>	<b>14</b>
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**Spring**

CS F201 or NRM F338	Computer Science I or Introduction to Geographic Information Systems	3
PHYS F212X	General Physics II	4
STAT F300	Statistics	3
GER (COM)		3

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<b>Credits</b>	<b>13</b>
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**Third Year****Fall**

MATH F401	Introduction to Real Analysis	3
STAT F402	Scientific Sampling	3
GER (Social Science I)		3
ANT Course		3

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<b>Credits</b>	<b>12</b>
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**Spring**

STAT F401	Regression and Analysis of Variance	4
GER (Art/Social Science/Humanities)		3
GER (Lab Science II)		4
Ethics Course		3

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<b>Credits</b>	<b>14</b>
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**Fourth Year****Fall**

ENGL F314 or ENGL F414	Technical Writing or Research Writing	3
MATH F371	Probability	3
Stat or Math Elective		3

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<b>Credits</b>	<b>9</b>
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**Spring**

LS F101X	Library Information and Research	1
MATH F408	Mathematical Statistics	3
STAT F454	Statistical Consulting Seminar	1

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<b>Credits</b>	<b>5</b>
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<b>Total Credits</b>	<b>94</b>
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