

# Climate and Atmospheric Sciences B.S.

## Program Requirements

Catalog Department Overview # (<https://catalog.uaf.edu/academic-departments/atmospheric-sciences/>)

## Minimum Requirements for Climate and Atmospheric Sciences B.S.: 120 credits

### Concentrations: Climate (p. 1), Forecasting (p. 1)

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

	Credits
<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:	
CHEM F105X General Chemistry I	
CHEM F106X General Chemistry II	
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. degree requirements complete:	
MATH F252X Calculus II	
PHYS F211X General Physics I	
PHYS F212X General Physics II	
<b>Atmospheric and Climate Sciences Program Requirements</b>	
Complete the following:	
ATM F101X Weather and Climate of Alaska	4
ATM F311 Instruments in Meteorology	3
ATM F401 Introduction to Atmospheric Sciences	3
ATM F407 Atmospheric Thermodynamics	3
ATM F413 Atmospheric Radiation	3
ATM F415 Cloud Physics	3
ATM F433 Atmospheric Remote Sensing	3
ATM F445 Atmospheric Dynamics	3
ATM F456 Climate and Climate Change	3
MATH F253X Calculus III	4
PHYS F220 Introduction to Computational Physics	4
PHYS F301 Introduction to Mathematical Physics	4
<b>Concentration</b>	
Complete one of the following:	17-20
Climate	
Forecasting	

### Electives

General Electives	4-11
<b>Total Credits</b>	<b>120</b>

## Concentrations

### Climate

	Credits
<b>Climate Concentration Requirements</b>	
Complete six of the following:	18-20
ATM F444 Weather Analysis and Forecasting	
ATM F446 Atmospheric Dynamics II: Climate Dynamics	
ATM F473 Micrometeorology with Focus on Subarctic and Arctic Ecosystems	
ATM F610 Analysis Methods in Meteorology and Climate	
ATM F658 Air-sea Interactions	
BIOL F418 Biogeography	
CE F344 Water Resources Engineering	
CHEM F331 Physical Chemistry I	
CHEM F406 Atmospheric Chemistry	
OCN F419 Ocean Circulation	
OCN F481 The Ocean and Global Change	
STAT F300 Statistics	
STAT F401 Regression and Analysis of Variance	
<b>Total Credits</b>	<b>18-20</b>

### Forecasting

	Credits
<b>Forecasting Concentration Requirements</b>	
Complete the following:	
ATM F443 Atmospheric Structure and Analysis	4
ATM F444 Weather Analysis and Forecasting	3
ATM F444L Weather Analysis and Forecasting Laboratory	1
Complete three of the following:	9-10
ATM F610 Analysis Methods in Meteorology and Climate	
CE F344 Water Resources Engineering	
CHEM F406 Atmospheric Chemistry	
OCN F419 Ocean Circulation	
STAT F300 Statistics	
STAT F401 Regression and Analysis of Variance	
<b>Total Credits</b>	<b>17-18</b>

## Roadmaps

Catalog Department Overview # (<https://catalog.uaf.edu/academic-departments/atmospheric-sciences/>)

Roadmaps provide suggested semester-by-semester study plans for programs and are based on full-time enrollment, unless otherwise specified.

- This roadmap should be used in conjunction with regular academic advising sessions. All students are encouraged to meet with their advisor or mentor each semester.
- Certain courses and milestones must be completed in the specified semester to ensure on-time graduation.
- Transfer credits may affect the roadmap.
- Requirements, course availability, and sequencing may change.
- Courses marked with (\*) are recommended.

## Climate Concentration

### First Year

Fall	Credits Spring	Credits
CHEM F105X <sup>7</sup>	4 ATM F101X <sup>20</sup>	4
MATH F251X <sup>6</sup>	4 CHEM F106X <sup>7</sup>	4
WRTG F111X <sup>1</sup>	3 LS F101X <sup>15</sup>	1
General Education Requirement - Arts	3 MATH F252X <sup>16</sup>	4
General Education Requirement - Humanities	3 Complete one of the following: <sup>1</sup>	3
	COM F121X	
	COM F131X	
	COM F141X(*)	
	<b>17</b>	<b>16</b>

### Second Year

Fall	Credits Spring	Credits
MATH F253X <sup>16,20</sup>	4 ATM F220(*) <sup>23</sup>	1
PHYS F211X <sup>17</sup>	4 MATH F302(*) <sup>23</sup>	3
Degree Requirement - Alaska Native-themed <sup>5</sup>	3 PHYS F212X <sup>17</sup>	4
Degree Requirement - Ethics	3 PHYS F220 <sup>20</sup>	4
Complete one of the following: <sup>1</sup>	3 General Education Requirement - Social Sciences	3
WRTG F211X		
WRTG F212X		
WRTG F213X(*)		
WRTG F214X		
	<b>17</b>	<b>15</b>

### Third Year

Fall	Credits Spring	Credits
ATM F401 <sup>20,25</sup>	3 ATM F415 <sup>20,25</sup>	3
ATM F407 <sup>20,25</sup>	3 PHYS F301 <sup>20,25</sup>	4
ATM F433 <sup>20,25</sup>	3 General Education Requirement - Social Sciences	3
ATM F445 <sup>20,25</sup>	3 Concentration Course <sup>25</sup>	3
Concentration Course <sup>25</sup>	3	
	<b>15</b>	<b>13</b>

### Fourth Year

Fall	Credits Spring	Credits
ATM F311 <sup>20,25</sup>	3 Concentration Course	3
ATM F413 <sup>20,25</sup>	3 Concentration Course	3

ATM F456 <sup>20,25</sup>	3 General Elective	3
Concentration Course <sup>25</sup>	3 General Elective	3
Concentration Course <sup>25</sup>	3	
	<b>15</b>	<b>12</b>

### Total Credits 120

### Footnote Definitions

General Education Requirements	Degree Requirements	Program & Other Requirements
1—Communication	8—Alaska Native-themed	20—Program Requirement
2—Arts	9—Communication	21—Capstone Requirement
3—Humanities	10—Computation	22—Concentration Course
4—Social Sciences	11—Ethics	23—General Elective
5—Additional Arts, Humanities or Social Sciences	12—Humanities	24—Minor Course
6—Mathematics	13—Human Relations	25—Upper Division
7—Natural Sciences	14—Humanities or Social Sciences	26—Program Elective
	15—Library & Information Research	
	16—Mathematics	
	17—Natural Sciences	
	18—Other	
	19—Social Sciences	

## Forecasting Concentration

### First Year

Fall	Credits Spring	Credits
CHEM F105X <sup>7</sup>	4 ATM F101X <sup>20</sup>	4
MATH F251X <sup>6</sup>	4 CHEM F106X <sup>7</sup>	4
WRTG F111X <sup>1</sup>	3 LS F101X <sup>15</sup>	1
General Education Requirement - Arts	3 MATH F252X <sup>16</sup>	4
General Education Requirement - Humanities	3 Complete one of the following: <sup>1</sup>	3
	COM F121X	
	COM F131X	
	COM F141X(*)	
	<b>17</b>	<b>16</b>

### Second Year

Fall	Credits Spring	Credits
MATH F253X <sup>16,20</sup>	4 ATM F220(*) <sup>23</sup>	1
PHYS F211X <sup>17</sup>	4 MATH F302(*) <sup>23</sup>	3
Degree Requirement - Alaska Native-themed <sup>5</sup>	3 PHYS F212X <sup>17</sup>	4
Degree Requirement - Ethics	3 PHYS F220 <sup>20</sup>	4
Complete one of the following: <sup>1</sup>	3 General Education Requirement - Social Sciences	3

WRTG F211X		
WRTG F212X		
WRTG F213X (*)		
WRTG F214X		
	<b>17</b>	<b>15</b>
<b>Third Year</b>		
<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
ATM F401 <sup>20,25</sup>	3 ATM F415 <sup>20,25</sup>	3
ATM F407 <sup>20,25</sup>	3 ATM F610, CE F344, CHEM F406, OCN F419, STAT F300, or STAT F401 <sup>22,25</sup>	3
ATM F413 <sup>20,25</sup>	3 PHYS F301 <sup>20,25</sup>	4
ATM F433 <sup>20,25</sup>	3 General Elective	2
General Education Requirement - Social Sciences	3	
	<b>15</b>	<b>12</b>
<b>Fourth Year</b>		
<b>Fall</b>	<b>Credits Spring</b>	<b>Credits</b>
ATM F311 <sup>20,25</sup>	3 ATM F444 <sup>22,25</sup>	3
ATM F443 <sup>22,25</sup>	4 ATM F444L <sup>22,25</sup>	1
ATM F445 <sup>20,25</sup>	3 ATM F610, CE F344, CHEM F406, OCN F419, STAT F300, or STAT F401 <sup>22</sup>	3
ATM F456 <sup>20,25</sup>	3 General Elective	3
ATM F610, CE F344, CHEM F406, OCN F419, STAT F300, or STAT F401 <sup>22</sup>	3 General Elective	2
	<b>16</b>	<b>12</b>
<b>Total Credits 120</b>		

### Footnote Definitions

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1—Communication	8—Alaska Native-themed	20—Program Requirement
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6—Mathematics	13—Human Relations	25—Upper Division
7—Natural Sciences	14—Humanities or Social Sciences	26—Program Elective
	15—Library & Information Research	
	16—Mathematics	
	17—Natural Sciences	
	18—Other	
	19—Social Sciences	

## Learning Outcomes

Catalog Department Overview # (<https://catalog.uaf.edu/academic-departments/atmospheric-sciences/>)

Learning Outcomes are specific, measurable statements that define the knowledge and skills students will gain by the end of the program.

Graduates of this program will be able to:

- Demonstrate technical knowledge: Fundamental understanding of the components (dynamics, thermodynamics, radiation, cloud processes, and climate variations) of the Earth's atmosphere. Concentration-focused skills: 1) Forecasting concentration graduates will be able to develop forecasts of the atmosphere at various time and space scales and 2) Climate concentration graduates will be able to analyze climate data and information to understand climate variability and change.
- Demonstrate ethical knowledge: Ethical guidelines are followed for all data collected and produced and for intellectual property
- Demonstrate problem solving: Ability to engage in analytical thinking, problem solving and demonstrate subject expertise
- Demonstrate written communication: Students should be able to compose clear text consisting of cogent arguments aimed at multiple audiences: professional and general audiences. Demonstrate oral communication: Students should be able to deliver a clear professional presentation for varied audiences (professional and general audiences) and field questions related to presentation with confidence and poise.