



Atmospheric, Oceanic,
and Earth Sciences

Atmospheric Sciences

Weather & Climate

Taking the World
By Storm

aoes.gmu.edu



Ms. Carmen Session

Retention and Advising Coordinator
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To contact your advisors:

- Log in Patriot Connect <https://connect.gmu.edu>
- Send an email to bsatmos@gmu.edu



Academic Programs

- Atmospheric Sciences BS Major (<https://catalog.gmu.edu/colleges-schools/science/atmospheric-oceanic-earth-sciences/atmospheric-sciences-bs/>)
- Atmospheric Science Minor (<https://catalog.gmu.edu/colleges-schools/science/atmospheric-oceanic-earth-sciences/atmospheric-science-minor/>)
- Climate Resilience and Adaptation Minor (ATMS) (<https://catalog.gmu.edu/colleges-schools/science/atmospheric-oceanic-earth-sciences/climate-resilience-adaptation-minor/>)
- Atmospheric Sciences, BS/Climate Science, Accelerated MS, BAMS (<https://catalog.gmu.edu/colleges-schools/science/atmospheric-oceanic-earth-sciences/climate-science-ms/#acceleratedmasterstext>)

Computational Atmospheric Sciences

Use math, science, and
computer programming to
study the atmosphere



Meteorology

Use math and science to study
the atmosphere



Weather, Climate, and Communication

Use science to understand
the atmosphere, and
communication to share it



Student Support and Experiential Opportunities

- The AOES faculty has a variety of expertise in Atmospheric Sciences and related fields (physical oceanography, ocean-land-atmosphere interaction, atmospheric chemistry, air quality).
 - A full list of all AOES department faculty members is at <https://science.gmu.edu/academics/departments-units/atmospheric-oceanic-earth-sciences/faculty-and-staff>
- AOES faculty and the scientists in the Center for Ocean-Land-Atmosphere Studies(COLA) are world leaders in the simulation and prediction of seasonal and longer-term climate.
 - COLA website (<http://cola.gmu.edu/>)
- Students have access to internships and other opportunities due to Mason's proximity to federal facilities such as forecasting at the National Weather Service Baltimore/Washington Weather Forecast Office and National Centers for Environmental Prediction, and Earth monitoring at NASA's Goddard Space Flight Center.
- Undergraduates research opportunities at GMU (<https://science.gmu.edu/academics/departments-units/atmospheric-oceanic-earth-sciences/majors-minors/undergraduate-research>)
- Graduates of the Atmospheric Sciences major can take a range of career paths including research (via graduate school) and operations in meteorology and climate.

Courses <https://catalog.gmu.edu/colleges-schools/science/atmospheric-oceanic-earth-sciences/atmospheric-sciences-bs/#requirementstext>

Banner Code: SC-BS-AOES

Degree Requirements

Total credits: minimum 120

This is a Green Leaf program.

Students should refer to the [Admissions & Policies](#) tab for specific policies related to this program.

Candidates for this degree must complete all core courses with a minimum GPA of 2.30.

Students seeking a bachelor's degree must apply at least 45 credits of upper-level courses (numbered 300 or above) toward graduation requirements.

Atmospheric Sciences Core	8/24
Chemistry	2 (1 lab)/4
Computer Science	1/3-4
Mathematics	3/11
Statistics	1/3
Physics	4 (2 labs)/8
Concentration in Computational Atmospheric Sciences (CAS)	6/18
Concentration in Meteorology (MTEO)	6/18
Concentration in Weather, Climate, and Communication (WCC)	6/18
Mason Core and Elective Credits	48-49

Atmospheric Sciences Core

EXPAND 

CLIM 102	Introduction to Global Climate Change Science (Mason Core)	4
CLIM 111	Introduction to the Fundamentals of Atmospheric Science (Mason Core)	3
CLIM 112	Introduction to the Fundamentals of Atmospheric Science Lab (Mason Core)	1
CLIM 301	Weather Analysis and Prediction	4
CLIM 408	Senior Research (Mason Core) ¹	3
CLIM 411	Atmospheric Dynamics	3
CLIM 429	Atmospheric Thermodynamics	3
PHYS 475	Atmospheric Physics	3
Total Credits		24

¹ Fulfills the writing intensive requirement.

Concentration in Computational Atmospheric Sciences (CAS)

EXPAND

The concentration gives students preparation in computational science, mathematics, and numerical modeling to support quantitative research and industry applications in professional or graduate contexts.

CLIM 319	Air Pollution	3
CLIM 470	Numerical Weather Prediction	3
CDS 251	Introduction to Scientific Programming	3
or CDS 301	Scientific Information and Data Visualization	
or CDS 302	Scientific Data and Databases (Mason Core)	
or CDS 303	Scientific Data Mining	
GGS 311	Geographic Information Systems	3
Select 6 credits from the following:		6
CLIM 312	Physical Climatology	
CLIM 401	Midlatitude Synoptic Meteorology	
CLIM 409	Research Internship	
CLIM 412	Physical Oceanography	
CLIM 425	Unlocking Past Climate: Models Proxies	
CLIM 438	Atmospheric Chemistry	
CLIM 440	Climate Dynamics	
CLIM 456	Introduction to Atmospheric Radiation	
GEOL 420	Earth Science and Policy (Mason Core)	
MATH 214	Elementary Differential Equations	
Total Credits		18

Concentration in Meteorology (MTEO)

EXPAND

This concentration is designed for students who are primarily interested in weather and weather forecasting. The required classes in this option emphasize atmospheric phenomena and operational prediction.

CLIM 314	Severe and Extreme Weather	3
CLIM 456	Introduction to Atmospheric Radiation	3
GGS 379	Remote Sensing	3
MATH 214	Elementary Differential Equations	3
Select 6 credits from the following:		6
CLIM 312	Physical Climatology	
CLIM 319	Air Pollution	
CLIM 401	Midlatitude Synoptic Meteorology	
CLIM 409	Research Internship	
CLIM 412	Physical Oceanography	
CLIM 425	Unlocking Past Climate: Models Proxies	
CLIM 438	Atmospheric Chemistry	
CLIM 440	Climate Dynamics	
CLIM 470	Numerical Weather Prediction	
GEOL 420	Earth Science and Policy (Mason Core)	
Total Credits		18

Concentration in Weather, Climate, and Communication (WCC)

EXPAND

The concentration is recommended for students interested in pursuing a career in broadcast meteorology or climate communications. It combines learning about the science of the atmosphere, climate, and weather, with experience in modern communication techniques.

CLIM 312	Physical Climatology	3
CLIM 314	Severe and Extreme Weather	3
COMM 208	Introduction to Media Production	3
or COMM 210	Voice and Articulation	
COMM 320	Digital Innovations in Professional Communication (Mason Core)	3
or COMM 356	Performance for Digital Production	
Select 6 credits from the following:		6
CLIM 319	Air Pollution	
CLIM 401	Midlatitude Synoptic Meteorology	
CLIM 409	Research Internship	
CLIM 412	Physical Oceanography	
CLIM 425	Unlocking Past Climate: Models Proxies	
CLIM 438	Atmospheric Chemistry	
CLIM 440	Climate Dynamics	
CLIM 456	Introduction to Atmospheric Radiation	
CLIM 470	Numerical Weather Prediction	
GEOL 420	Earth Science and Policy (Mason Core)	
Total Credits		18

MASON CORE Requirements

Foundation (12 credits)

- Written Communication (3 credits, ENGH 101)
- Oral Communication (3 credits, COMM 101)
- Quantitative Reasoning (3 credits, MATH 113)
- Information Technology and Computing (3 credits, CDS 130 or CS 112)

Exploration (22 credits)

- Arts (3 credits)
- Global Contexts (3 credits)
- Global History (3 credits, HIST 125)
- Literature (3 credits)
- Natural Science (7 credits, fulfilled by major requirement courses)
- Social and Behavioral Sciences (3 credits)
- Just Society (optional)

Integration (9 credits)

- Written Communication (3 credits, ENGH 302 with pre-requisite)
- Writing Intensive (3 credits, CLIM 408)
- Mason Apex (3 credits, GEOL 420)

Bachelor of Science in Atmospheric Sciences

Meteorology (MTEO) Concentration

Atmospheric Science Core (36 credits)

Introduction to Global Climate Change Science	CLIM 102 (4)
Introduction to the Fundamentals of Atmospheric Science	CLIM 111 (3)
Introduction to the Fundamentals of Atmospheric Science Lab	CLIM 112 (1)
Weather Analysis and Prediction	CLIM 301 (4)
Senior Research	CLIM 408 (3)
Atmospheric Dynamics	CLIM 411 (3)
Atmospheric Thermodynamics	CLIM 429 (3)
Atmospheric Physics	PHYS 475 (3)
Severe and Extreme Weather	CLIM 314 (3) equivalent to GGS 314
Introduction to Atmospheric Radiation	CLIM 456 (3)
Remote Sensing	GIS 379 (3)
Elementary Differential Equations	MATH 214 (3)

Concentration Electives (6 credits)

6 credits from the following

Physical Climatology	CLIM 312 (3) equivalent to GGS 312
Air Pollution	CLIM 319 (3)
Midlatitude Synoptic Meteorology	CLIM 401 (3)
Research Internship	CLIM 409 (3)
Physical Oceanography	CLIM 412 (3)
Unlocking Past Climate: Models Proxies	CLIM 425 (3)
Atmospheric Chemistry	CLIM 438 (3) equivalent to CHEM 438
Midlatitude synoptic meteorology	CLIM 401 (3)
Climate Dynamics	CLIM 440 (3)
Numerical Weather Prediction	CLIM 470 (3)
Earth Science and Policy	GEOL 420 (Mason Core)

Chemistry (4 credits)

General Chemistry I	CHEM 211(3)	General Chemistry Laboratory I	CHEM 213 (1)
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Computer Science (3-4 credits)

Computing for Scientists	CDS 130 (3) or
Introduction to Computer Programing	CS112 (4)

Mathematics (11 credits)

Analytic Geometry and Calculus I	MATH 113 (4)
Analytic Geometry and Calculus II	MATH 114 (4)
Analytic Geometry and Calculus III	MATH 213 (4)

Statistics (3 credits)

Introductory Statistics I	STAT 250 (3)
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Physics (8 credits)

University Physics I	PHYS 160 (3)	University Physics I Lab	PHYS 161(1)
University Physics II	PHYS 260 (3)	University Physics II Lab	PHYS 261(1)

Mason Core and Electives (48 – 49 Credits)

In order to meet a minimum of 120 credits, this degree requires an additional 48 – 49 credits (dependent upon the course chosen for the Computer Science requirement), which may be applied towards any remaining Mason Core requirements, required for bachelor's degree, and elective courses.

Bachelor of Science in Atmospheric Sciences

Weather, Climate, and Communication (WCC) Concentration

Atmospheric Science Core (36 credits)

Introduction to Global Climate Change Science	CLIM 102 (4)
Introduction to the Fundamentals of Atmospheric Science	CLIM 111 (3)
Introduction to the Fundamentals of Atmospheric Science Lab	CLIM 112 (1)
Weather Analysis and Prediction	CLIM 301 (4)
Senior Research	CLIM 408 (3)
Atmospheric Dynamics	CLIM 411 (3)
Atmospheric Thermodynamics	CLIM 429 (3)
Atmospheric Physics	PHYS 475 (3)
Physical Climatology	CLIM 312 (3) equivalent to GGS 312
Severe and Extreme Weather	CLIM 314 (3)
Introduction to Media Production	COMM 208 (3) or
Voice and Articulation	COMM 210 (3)
Digital Innovations in Professional Communications	COMM 320 (3) or
Performance in Digital Production	COMM 356 (3)

Concentration Electives (6 credits)

6 credits from the following

Air Pollution	CLIM 319 (3)
Midlatitude Synoptic Meteorology	CLIM 401 (3)
Research Internship	CLIM 409 (3)
Physical Oceanography	CLIM 412 (3)
Unlocking Past Climate: Models Proxies	CLIM 425 (3)
Atmospheric Chemistry	CLIM 438 (3) equivalent to CHEM 438
Climate Dynamics	CLIM 440 (3)
Introduction to Atmospheric Radiation	CLIM 456 (3)
Numerical Weather Prediction	CLIM 470 (3)
Earth Science and Policy	GEOL 420 (3)

Chemistry (4 credits)

General Chemistry I	CHEM 211 (3)	General Chemistry Laboratory I	CHEM 213 (1)
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Computer Science (3-4 credits)

Computing for Scientists	CDS 130 (3) or
Introduction to Computer Programing	CS 112 (4)

Mathematics (11 credits)

Analytic Geometry and Calculus I	MATH 113 (4)
Analytic Geometry and Calculus II	MATH 114 (4)
Analytic Geometry and Calculus III	MATH 213 (4)

Statistics (3 credits)

Introductory Statistics I	STAT 250 (3)
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Physics (8 credits)

University Physics I	PHYS 160 (3)	University Physics I Lab	PHYS 161(1)
University Physics II	PHYS 260 (3)	University Physics II Lab	PHYS 261(1)

Mason Core and Electives (48 – 49 Credits)

In order to meet a minimum of 120 credits, this degree requires an additional 48 – 49 credits (dependent upon the course chosen for the Computer Science requirement), which may be applied towards any remaining Mason Core requirements, required for bachelor's degree, and elective courses.

Bachelor of Science in Atmospheric Sciences

Computational Atmospheric Sciences (CAS) Concentration

Atmospheric Science Core (36 credits)

Introduction to Global Climate Change Science	CLIM 102 (4)
Introduction to the Fundamentals of Atmospheric Science	CLIM 111 (3)
Introduction to the Fundamentals of Atmospheric Science Lab	CLIM 112 (1)
Weather Analysis and Prediction	CLIM 301 (4)
Senior Research	CLIM 408 (3)
Atmospheric Dynamics	CLIM 411 (3)
Atmospheric Thermodynamics	CLIM 429 (3)
Atmospheric Physics	PHYS 475 (3)
Air Pollution	CLIM 319 (3)
Numerical Weather Prediction	CLIM 470 (3)
Introduction to Scientific Programming	CDS 251 (3) or
Scientific Information and Data Visualization	CDS 301 (3) or
Scientific Data and Databases	CDS 302 (3) or
Scientific Data Mining	CDS 303 (3)
Geographic Information Systems	GIS 311 (3)

Concentration Electives (6 credits)

6 credits from the following

Physical Climatology	CLIM 312 (3) equivalent to GGS 312
Midlatitude Synoptic Meteorology	CLIM 401 (3)
Research Internship	CLIM 409 (3)
Physical Oceanography	CLIM 412 (3)
Unlocking Past Climate: Models Proxies	CLIM 425 (3)
Atmospheric Chemistry	CLIM 438 (3) equivalent to CHEM 438
Climate Dynamics	CLIM 440 (3)
Earth Science and Policy	GEOL 420 (3)
Elementary Differential Equations	MATH 214 (3)

Chemistry (4 credits)

General Chemistry I	CHEM 211 (3)	General Chemistry Laboratory I	CHEM 213 (1)
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Computer Science (3-4 credits)

Computing for Scientists	CDS 130 (3) or
Introduction to Computer Programing	CS 112 (4)

Mathematics (11 credits)

Analytic Geometry and Calculus I	MATH 113 (4)
Analytic Geometry and Calculus II	MATH 114 (4)
Analytic Geometry and Calculus III	MATH 213 (4)

Statistics (3 credits)

Introductory Statistics I	STAT 250 (3)
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Physics (8 credits)

University Physics I	PHYS 160 (3)	University Physics I Lab	PHYS 161(1)
University Physics II	PHYS 260 (3)	University Physics II Lab	PHYS 261(1)

Mason Core and Electives (48 – 49 Credits)

In order to meet a minimum of 120 credits, this degree requires an additional 48 – 49 credits (dependent upon the course chosen for the Computer Science requirement), which may be applied towards any remaining Mason Core requirements, required for bachelor's degree, and elective courses.

Sample Plan of Study

Computational Atmospheric Sciences Concentration

1st Year – Freshman Year

Fall Semester		Spring Semester	
MATH 113 Analytic Geom & Calc I ¹	4	MATH 114 Analytic Geom & Calc II	4
CLIM 111 Intro Fund Atmos Sci*	3	CS 112 Intro Comp Program or CDS 130 Computing for Scientists	3-4
CLIM 112 Intro Fund Atmos Sci Lab*	1	CLIM 102 Intro Global Clim Change Sci*	4
COMM 101 Interpersonal & Group Interact. ²	3	ENGH 101 Composition ⁴	3
Exploration Requirements ³	3		
UNIV 100 Introduction to Mason	2		
Total Credits	16		14-15

*Atmospheric Sciences Core

¹A placement test is required (visit http://math.gmu.edu/placement_test.php)

²Foundation Requirements: Oral Communication

³One from the following categories: Arts, Global Contexts, Global History, Literature

⁴Foundation Requirements: Written Communication ([lower-level](#))

2nd Year - Sophomore Year

Fall Semester		Spring Semester	
MATH 213 Analytic Geom and Calc. III	3	CHEM 211 General Chemistry I and CHEM 213 General Chemistry I Lab	4
PHYS 160 University Physics I	3	PHYS 260 University Physics II	3
PHYS 161 University Physics I Lab	1	PHYS 261 University Physics II Lab	1
CLIM 301 Weather Analysis and Pred*	4	STAT 250 Introductory Statistics	3
CLIM 319 Air Pollution**	3	ENGH 302 Advanced Composition ⁵	3
Exploration Requirements ³	3	Exploration Requirements ³	3
Total Credits	17	Total Credits	17

**Concentration Requirement

⁵Integration Requirements: Written Communication ([upper-level](#))

3rd Year - Junior Year

Fall Semester		Spring Semester	
CLIM 429 Atmospheric Thermodynamics*	3	CLIM 411 Atmospheric Dynamics*	3
CLIM 470 Numerical Weather Prediction**	3	Exploration Requirements ³	3
CLIM Elective ⁷	3	GGG 311 Geographic Information Sys. **	3
Exploration Requirements ³	3	CDS XXX Computing requirement** ⁸	3
Total Credits	12	Total Credits	12

⁶Offered every other year on even calendar years

⁷One of the following: CLIM 312 Physical Climatology, CLIM 401 Synoptic Meteorology, CLIM 409 Research Internship, CLIM 412 Physical Oceanography, CLIM 425 Unlocking Past Climates: Models and Proxies, CLIM 456 Introduction to atmospheric Radiation, MATH 214 Elementary Differential Equations

⁸One of the following: CDS 251 Introduction to Scientific Programming, CDS 301 Scientific Information and Data Visualization, CDS 302 Scientific Data and Database, CLIM 303 Scientific Data Mining

4th Year - Senior Year

Fall Semester		Spring Semester	
GEOL 420 Earth Science and Policy ⁹	3	PHYS 475 Atmospheric Physics*	3
CLIM Elective ⁷	3 - 6	CLIM 408 Senior Research ¹⁰	3
Global Contexts Requirement	3 - 6	CLIM elective ¹¹	3-6
Total Credits	12-15	Total Credits	9-12

⁹Mason Integration Requirements: Mason Apex

¹⁰ Integration Requirements: Writing Intensive (WI) course in the major

¹¹One of the following: CLIM 409 Research Internship, CLIM 438 Atmospheric Chemistry, CLIM 440 Climate Dynamics

Notes:

MINIMUM CREDITS TO GRADUATE: 120 credits

UPPER DIVISION CREDITS: Minimum 45 credits at upper level (course number 300 and above).

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The University Catalog is the official reference for program requirements.

Sample Plan of Study

Meteorology Concentration

1st Year – Freshman Year

Fall Semester		Spring Semester	
MATH 113 Analytic Geom & Calc I ¹	4	MATH 114 Analytic Geom & Calc II	4
CLIM 111 Intro Fund Atmos Sci*	3	CS 112 Intro Comp Program or CDS 130 Computing for Scientists	3-4
CLIM 112 Intro Fund Atmos Sci Lab*	1	CLIM 102 Intro Global Clim Change Sci*	4
COMM 101 Interpersonal & Group Interact. ²	3	ENGH 101 Composition ⁴	3
Exploration Requirements ³	3		
UNIV 100 Introduction to Mason	2		
Total Credits	16		14-15

*Atmospheric Sciences Core

¹A placement test is required (visit http://math.gmu.edu/placement_test.php)

²Foundation Requirements: Oral Communication

³One from the following categories: Arts, Global Contexts, Global History, Literature

⁴Foundation Requirements: Written Communication ([lower-level](#))

2nd Year - Sophomore Year

Fall Semester		Spring Semester	
MATH 213 Analytic Geom and Calc. III	3	CHEM 211 General Chemistry I and CHEM 213 General Chemistry I Lab	4
PHYS 160 University Physics I	3	PHYS 260 University Physics II	3
PHYS 161 University Physics I Lab	1	PHYS 261 University Physics II Lab	1
CLIM 301 Weather Analysis and Pred*	4	CLIM 314 Severe & Extreme Weather**	3
ENGH 302 Advanced Composition ⁵	3	STAT 250 Introductory Statistics	3
Exploration Requirements ³	3	Exploration Requirements ³	3
Total Credits	17	Total Credits	17

**Concentration Requirement

⁵Integration Requirements: Written Communication ([upper-level](#))

3rd Year - Junior Year

Fall Semester		Spring Semester	
CLIM 429 Atmospheric Thermodynamics*	3	CLIM 411 Atmospheric Dynamics*	3
CLIM 456 Introduction to Atm Radiation* ⁶ or CLIM Elective ⁷	3	Exploration Requirements ³	3
CLIM Elective ⁷	3	GGG 379**	3
Exploration Requirements ³	3-6	MATH 214**	3
Total Credits	12-15	Total Credits	12

⁶Offered every other year on even calendar years

⁷One of the following: CLIM 312 Physical Climatology, CLIM 319 Air Pollution, CLIM 401 Synoptic Meteorology, CLIM 409 Research Internship, CLIM 412 Physical Oceanography, CLIM 425 Unlocking Past Climates: Models and Proxies, CLIM 470 Numerical Weather Prediction

4th Year - Senior Year

Fall Semester		Spring Semester	
GEOL 420 Earth Science and Policy ⁸	3	PHYS 475 Atmospheric Physics*	3
CLIM 456 Introduction to Atm Radiation* ⁶ or CLIM Elective ⁷	3	CLIM 408 Senior Research ⁹	3
CLIM Elective ⁷	3	CLIM elective ¹⁰	3-6
Global Contexts Requirement	3		
Total Credits	12	Total Credits	9-12

⁸Mason Integration Requirements: Mason Apex

⁹Integration Requirements: Writing Intensive (WI) course in the major

¹⁰One of the following: CLIM 409 Research Internship, CLIM 438 Atmospheric Chemistry, CLIM 440 Climate Dynamics

Notes:

MINIMUM CREDITS TO GRADUATE: 120 credits

UPPER DIVISION CREDITS: Minimum 45 credits at upper level (course number 300 and above).

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Sample Plan of Study

Weather, Climate and Communication Concentration

1st Year – Freshman Year

Fall Semester		Spring Semester	
MATH 113 Analytic Geom & Calc I ¹	4	MATH 114 Analytic Geom & Calc II	4
CLIM 111 Intro Fund Atmos Sci*	3	CS 112 Intro Comp Program or CDS 130 Computing for Scientists	3-4
CLIM 112 Intro Fund Atmos Sci Lab*	1	CLIM 102 Intro Global Clim Change Sci*	4
COMM 101 Interpersonal & Group Interact. ²	3	ENGH 101 Composition ⁴	3
Exploration Requirements ³	3		
UNIV 100 Introduction to Mason	2		
Total Credits	16		14-15

*Atmospheric Sciences Core

¹A placement test is required (visit http://math.gmu.edu/placement_test.php)

²Foundation Requirements: Oral Communication

³One from the following categories: Arts, Global Contexts, Global History, Literature

⁴Foundation Requirements: Written Communication ([lower-level](#))

2nd Year - Sophomore Year

Fall Semester		Spring Semester	
MATH 213 Analytic Geom and Calc. III	3	CHEM 211 General Chemistry I and CHEM 213 General Chemistry I Lab	4
PHYS 160 University Physics I	3	PHYS 260 University Physics II	3
PHYS 161 University Physics I Lab	1	PHYS 261 University Physics II Lab	1
CLIM 301 Weather Analysis and Pred*	4	STAT 250 Introductory Statistics	3
COMM 208 Intro to Comm Media Prod** or COMM 210 Voice and Articulation**	3	ENGH 302 Advanced Composition ⁵	3
Exploration Requirements ³	3	Exploration Requirements ³	3
Total Credits	17	Total Credits	17

**Concentration Requirement

⁵Integration Requirements: Written Communication ([upper-level](#))

3rd Year - Junior Year

Fall Semester		Spring Semester	
CLIM 429 Atmospheric Thermodynamics*	3	CLIM 411 Atmospheric Dynamics*	3
CLIM 312 Physical Climatology**	3	Exploration Requirements ³	3
CLIM Elective ⁷	3	CLIM 314 Severe & Extreme Weather **	3
Exploration Requirements ³	3	COMM 320 Digital Innov in Professional Comm** or COMM 335 Organizational Communications**	3
Total Credits	12	Total Credits	12

⁶Offered every other year on even calendar years

⁷One of the following: CLIM 319 Air Pollution, CLIM 401 Synoptic Meteorology, CLIM 409 Research Internship, CLIM 412 Physical Oceanography, CLIM 425 Unlocking Past Climates: Models and Proxies, CLIM 456 Introduction to atmospheric Radiation, CLIM 470 Numerical Weather Prediction

4th Year - Senior Year

Fall Semester		Spring Semester	
GEOL 420 Earth Science and Policy ⁹	3	PHYS 475 Atmospheric Physics*	3
CLIM Elective ⁷	3 - 6	CLIM 408 Senior Research ¹⁰	3
Global Contexts Requirement	3 - 6	CLIM elective ¹¹	3-6
Total Credits	12-15	Total Credits	9-12

⁹Mason Integration Requirements: Mason Apex

¹⁰ Integration Requirements: Writing Intensive (WI) course in the major

¹¹One of the following: CLIM 409 Research Internship, CLIM 438 Atmospheric Chemistry, CLIM 440 Climate Dynamics

Notes:

MINIMUM CREDITS TO GRADUATE: 120 credits

UPPER DIVISION CREDITS: Minimum 45 credits at upper level (course number 300 and above).

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CLIM Course Schedule

Semester /Year	Even Calendar Years	Odd Calendar Years
Fall Semester, Every year	CLIM 101, Global Warming: Weather, Climate and Society CLIM 111/PHYS 111, Introduction to the Fundamentals of Atmospheric Science CLIM 112/PHYS 112, Introduction to the Fundamentals of Atmospheric Science Laboratory	CLIM 101, Global Warming: Weather, Climate and Society CLIM 111/PHYS 111, Introduction to the Fundamentals of Atmospheric Science CLIM 112/PHYS 112, Introduction to the Fundamentals of Atmospheric Science Laboratory
	CLIM 301, Weather Analysis and Prediction CLIM 312/GGS 312, Physical Climatology CLIM 319/GGS 319, Air Pollution CLIM 408, Senior Research Project CLIM 412/512/GEOL 412, Physical Oceanography CLIM 429, Atmospheric Thermodynamics CLIM 470, Numerical Weather Prediction	CLIM 301, Weather Analysis and Prediction CLIM 312/GGS 312, Physical Climatology CLIM 319/GGS 319, Air Pollution CLIM 408, Senior Research Project CLIM 412/512/GEOL 412, Physical Oceanography CLIM 429, Atmospheric Thermodynamics CLIM 470, Numerical Weather Prediction
Fall Semester, Every other year	CLIM 680, Climate Data CLIM 690, Scientific Basis of Climate Change CLIM 711, Introduction to Atmospheric Dynamics CLIM 712, Physical and Dynamical Oceanography CLIM 751, Predictability and Prediction of Weather and Climate	CLIM 680, Climate Data CLIM 690, Scientific Basis of Climate Change CLIM 711, Introduction to Atmospheric Dynamics CLIM 712, Physical/Dynamical Oceanography CLIM 751, Predictability and Prediction of Weather and Climate
	CLIM 456, Introduction to Atmospheric Radiation CLIM 753, General Circulation of the Atmosphere CLIM 636, Atmospheric Aerosols	CLIM 625, Paleoclimate Models and Proxies CLIM 750, Geophysical Fluid Dynamics CLIM 763, Advanced Statistical Methods in Climate Research
Spring Semester, Every year	CLIM 102, Introduction to Global Climate Change	CLIM 102, Introduction to Global Climate Change
	CLIM 314/GGS 314, Severe and Extreme Weather CLIM 401/601, Synoptic Meteorology CLIM 408, Senior Research Project CLIM 411/511, Atmospheric Dynamics CLIM 438/CHEM 438, Atmospheric Chemistry CLIM 440, Climate Dynamics	CLIM 314/GGS 314, Severe and Extreme Weather CLIM 401/601, Synoptic Meteorology CLIM 408, Senior Research Project CLIM 411/511, Atmospheric Dynamics CLIM 438/CHEM 438, Atmospheric Chemistry CLIM 440, Climate Dynamics
Spring Semester, Every other year	CLIM 610, Introduction to the Physical Climate System CLIM 614, Land-Climate Interactions CLIM 762, Statistical Methods in Climate Research CLIM 997, Doctoral Qualification	CLIM 610, Introduction to the Physical Climate System CLIM 614, Land-Climate Interactions CLIM 762, Statistical Methods in Climate Research CLIM 997, Doctoral Qualification
	CLIM 713, Atmosphere-Ocean Interaction CLIM 715, Numerical Simulation in Weather and Climate CLIM 759, Atmospheric Convection	CLIM 631, Urban Climate* CLIM 670, Earth System Modeling CLIM 752, Ocean General Circulation CLIM 754, Elements of Tropical Climate System

Suggested Courses to meet the NOAA Meteorologist Requirement (Meteorology Series 1340)

The following is a guidance for the recommended courses that can be used to meet the NOAA meteorologist (Meteorology Series 1340, <https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/1300/meteorology-series-1340/>). In the following text, the NOAA requirements are in black, and the corresponding courses are in blue.

Meteorology Series, 1340

Individual Occupational Requirements

Basic Requirements:

A. Degree: meteorology, atmospheric science, or other natural science major that included:

1. At least 24 semester (36 quarter) hours of credit in meteorology/atmospheric science including a minimum of:

1a. Six semester hours of atmospheric dynamics and thermodynamics;*

[CLIM411 \(Atmospheric Dynamics, 3 credits\)](#)

[CLIM429 \(Atmospheric Thermodynamics, 3 credits\)](#)

1b. Six semester hours of analysis and prediction of weather systems (synoptic/mesoscale);

[CLIM 301 \(Weather Analysis and Prediction, 4 credits, with lab\)](#)

[CLIM 314 \(Severe and Extreme Weather, 3 credits\)](#)

[CLIM 401 \(Midlatitude synoptic meteorology, 3 credits\)](#)

1c. Three semester hours of physical meteorology;

[PHYS 475 \(Atmospheric Physics, 3 credits\)](#)

1d. Two semester hours of remote sensing of the atmosphere and/or instrumentation.

[GGS 379 \(Remote Sensing, 3 credits\)](#)

2. Six semester hours of physics, with at least one course that includes laboratory sessions.*

[PHYS 160 \(University Physics I, 3 credits\)](#)

[PHYS 161 \(University Physics I Laboratory, 1 credit\)](#)

[PHYS 260 \(University Physics II, 3 credits\)](#)

[PHYS 261 \(University Physics II Laboratory, 1 credit\)](#)

3. Three semester hours of ordinary differential equations.*

[MATH 214 \(Elementary Differential Equations, 3 credits\)](#)

4. At least nine semester hours of course work appropriate for a physical science major in any combination of three or more of the following: physical hydrology, statistics, chemistry, physical oceanography, physical climatology, radiative transfer, aeronomy, advanced thermodynamics, advanced electricity and magnetism, light and optics, and computer science.

Recommended courses:

[STAT 250 \(Introductory Statistics I, 3 credits\)](#)

[CHEM 211 \(General Chemistry I, 3 credits\)](#)

[CHEM 213 \(General Chemistry Laboratory, 1 credit\)](#)

[CLIM 312 \(Physical Climatology, 3 credits\)](#)

[CLIM 412 \(Physical Oceanography, 3 credits\)](#)

[CLIM 438 \(Atmospheric Chemistry, 3 credits\)](#)

[CLIM 456 \(Introduction to Atmospheric Radiation, 3 credits\)](#)

as well as other relevant courses on the list of required electives.

* There is a prerequisite or corequisite of calculus for course work in atmospheric dynamics and thermodynamics, physics, and differential equations. Calculus courses must be appropriate for a physical science major.

or

B. Combination of education and experience -- course work as shown in A above, plus appropriate experience or additional education.