

Petition for Exemption to SD2015F
 Department of Atmospheric Sciences (ATMS)
 23 February 2024

1. Executive Summary

The Department of Atmospheric Sciences (ATMS) provides a comprehensive and rigorous course of study that prepares students for careers in weather forecasting, climatology, and broadcast meteorology. The careful design of the weather forecasting and climatology curricula satisfies federal civil service requirements and the new broadcast meteorology curriculum satisfies professional certification requirements, while all concentrations provide students with interdisciplinary skills for their future careers. Peer institution comparisons and graduation data clearly support the assertion that our program requirements remain effective and streamlined.

2. ATMS Curriculum

The vast majority of meteorology/atmospheric sciences programs in the United States, including ATMS, are designed to satisfy the U.S. Office of Personnel Management qualifications for federal employment as a meteorologist. These are commonly referred to as the GS-1340 requirements. Students who do not fulfill the required coursework are ineligible for employment with the National Weather Service (NWS) and related branches of the Department of Commerce. *Providing a curriculum that leaves students without the minimum requirements necessary to work for the biggest employer of meteorologists in the nation would be a fatal development for our department.*

The GS-1340 requirements are published online (<https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/1300/meteorology-series-1340>). Table 1 summarizes these requirements and lists the UNC Asheville courses that satisfy them.

GS-1340 Requirement	Courses That Satisfy Requirement
6 semester hours of atmospheric dynamics	ATMS 305, ATMS 310
6 semester hours of analysis and prediction	ATMS 410, ATMS 411
3 semester hours of physical meteorology	ATMS 455
2 semester hours of remote sensing/instrumentation	ATMS 320
6 semester hours of physics, including at least one lab	PHYS 221, PHYS 222
3 semester hours of differential equations	MATH 394
9 additional semester hours of appropriate courses	ATMS 223, ATMS 230 or ATMS 235 (proposed), ATMS 355, ATMS 405, CHEM 132, CSCI 183, ENVR 338

Table 1: Mapping of ATMS and ancillary courses to GS-1340 requirements.

The direct mapping of courses totals 38 credit hours (note that ATMS 320 is 3 credit hours and the physics courses and corresponding labs are each 4 credit hours, adding 3 credits to the 35 semester-hour total strictly required to meet GS-1340 requirements). Additional courses must be completed either to satisfy prerequisites for the courses listed above or to acquire critical oral and written communication skills:

- ATMS 103 (*Introduction to Meteorology*, 3 credit hours)
- ATMS 203 (*Foundations of Atmospheric Science I*, 2 credit hours)
- ATMS 204 (*Foundations of Atmospheric Science II*, 2 credit hours)
- MATH 191/192/291 (*Calculus I, II, III*; 12 credit hours) – Required for MATH 394
- ATMS 464 (*Scientific Writing*, 3 credit hours) – Upper-level scientific writing and research course

The core ATMS curriculum totals a minimum of 60 credit hours. The remaining credit hours depend on the major concentration selected by the student. Appendix A shows the pathway to graduation for each of the three atmospheric sciences major concentrations.

a. Weather Forecasting Concentration (69 total credit hours)

Students in the weather forecasting concentration typically prepare for careers with the NWS or the private forecasting enterprise. Completion of this concentration requires the following courses:

- ATMS 350 (*Weather Forecasting*, 3 credit hours)
- Two electives chosen from ATMS 223 (*Physical Climatology*), ATMS 355 (*Physical Oceanography*), ATMS 405 (*Meteorological Statistics*), and ENVR 338 (*Principles of Hydrology*) – 6 credit hours
- One additional 300-400 level ATMS elective (3 credit hours)

The two electives chosen from the list of four courses ensure that students fulfill the topical requirements of the GS-1340 policy when combined with a required computer programming course that fulfills the computer competency requirement. The third elective at the 300-400 level is open-ended and intended to give majors some flexibility in choosing a special topical course in meteorology or climatology, such as ATMS 420 (*Applied Climatology*) or ATMS 345 (*Tropical Meteorology*).

b. Climatology Concentration (69 total credit hours)

Students in the climatology concentration are preparing for careers in the climate sector. This sub-discipline of the atmospheric sciences has experienced tremendous growth over the past two decades as climate change has come to the forefront in many areas of the government and the private sector. Historically, many ATMS students in this concentration have continued their education in graduate school.

Courses required for the climatology concentration include:

- ATMS 223 (*Physical Climatology*, 3 credit hours)
- ATMS 405 (*Meteorological Statistics*, 3 credit hours)
- ATMS 420 (*Applied Climatology*, 3 credit hours)
- One additional 300-400 level ATMS elective (3 credit hours)

The additional 300-400 elective is intended to give majors some flexibility in choosing a related climatology or atmospheric sciences course that is not part of the required curriculum, such as ATMS 315 (*Radar and Satellite Meteorology*), ATMS 316 (*Mesoscale Meteorology*), ATMS 345 (*Tropical Meteorology*), or ATMS 350 (*Weather Forecasting*).

c. Broadcast Meteorology Concentration (72 total credit hours, proposed)

Prior to the creation of the broadcast meteorology concentration in the 2013–14 academic year, ATMS graduated students who navigated toward successful careers as meteorologists with broadcast media companies. ATMS formally created this area of study to provide a more structured preparation for students planning careers in broadcast meteorology. The current curriculum reduces the emphasis on upper-level calculus and adds courses on journalism, video production, and public speaking. This is the most interdisciplinary concentration in the atmospheric sciences program.

The proposed curricular revision to the broadcast meteorology concentration allows our students to meet the American Meteorological Society’s new Certified Broadcast Meteorologist (CBM) program qualifications so that graduates will be better prepared for employment upon completion of the degree. Students who complete the requirements for the *current* broadcast meteorology curriculum will fall short of these qualifications. This is a disservice to our students and a continuation of the current curriculum would likely prevent future students interested in broadcast meteorology from enrolling at UNC Asheville. The proposed curricular revision increases the course load for the broadcast meteorology concentration by only a single credit hour from the most recently approved SD2015F exemption petition in 2019.

CBM Program Qualifications	Courses That Satisfy Requirement
3 semester hours of atmospheric dynamics	ATMS 310
3 semester hours of atmospheric thermodynamics	ATMS 305
3 semester hours of atmospheric physics or physical meteorology	ATMS 455
3 semester hours of synoptic meteorology	ATMS 410, ATMS 411
3 semester hours of mesoscale meteorology	ATMS 316
3 semester hours of atmospheric measurements or remote sensing	ATMS 315, ATMS 320
3 semester hours in applied/specialty meteorology such as: advanced dynamics, agricultural meteorology, air pollution meteorology, applied climatology, aviation meteorology, broadcast meteorology, hydrology or hydrometeorology, physical oceanography, tropical meteorology, and weather forecasting	ATMS 223, ATMS 326, ATMS 328, ATMS 345, ATMS 350, ATMS 355, ENVR 338
3 semester hours of a synthesizing experience such as work experience, internship, capstone course or research project	ATMS 381, ATMS 382, ATMS 383, ATMS 490, ATMS 499
Calculus sequence (3 courses) that includes differential, integral, vector, and multivariable calculus	MATH 191, MATH 192, MATH 291
Probability and applied statistics	ATMS 405
Physics (a calculus-based course with a lab covering fundamentals of mechanics and thermodynamics)	PHYS 221
An appropriate level of coursework or demonstrated competency in computer science in data analysis, modeling, and visualization to allow inferences about the atmosphere; software development; and application of numerical and statistical methods to atmospheric science problems.	ATMS 203, ATMS 204, ATMS 235 (proposed), CSCI 183
An appropriate level of coursework or demonstrated competency in communication to effectively communicate and interact with scientific, technical, and lay audiences using scientific evidence; discuss and interpret current weather and climate events and forecasts through multiple modalities, including social media; and craft a scientific presentation and write a scientific report.	ATMS 201 (proposed), ATMS 328, ATMS 464, DRAM 213, MCOM 201
A course covering Earth’s climate system	ATMS 223

Table 2: Mapping of ATMS and ancillary courses to the American Meteorological Society’s CBM requirements.

The CBM program qualifications appear online (<https://www.ametsoc.org/index.cfm/ams/education-careers/careers/ams-professional-certification-programs/certified-broadcast-meteorologist-program-cbm>). Table 2 summarizes these requirements and lists the UNC Asheville courses that satisfy them.

The broadcast meteorology course requirements necessarily differ somewhat from the traditional ATMS curriculum because of the specialized CBM qualifications and courses needed for career preparation. MATH 394 (*Differential Equations*) is not necessary and the specific mix of electives differs from the core ATMS curriculum. The prerequisite and computer science requirements remain consistent across all concentrations. Specific courses required for the broadcast meteorology concentration include:

- DRAM 213 (*Public Speaking/Presentations*, 3 credit hours)
- MCOM 201 (*Basic Journalism*, 4 credit hours)
- ATMS 223 (*Applied Climatology*, 3 credit hours)
- ATMS 316 (*Mesoscale Meteorology*, 3 credit hours)
- ATMS 328 (*Broadcast Meteorology*, 3 credit hours)
- ATMS 350 (*Weather Forecasting*, 3 credit hours)
- ATMS 405 (*Meteorological Statistics*, 3 credit hours)
- A choice of either ATMS 315 (*Radar and Satellite Meteorology*, 3 credit hours) or ATMS 320 (*Meteorological Instruments*, 3 credit hours)
- ATMS 381, 382, 383, 490, or 499 (*Cooperative Education, Professional and Technical Internship, or Undergraduate Research in Atmospheric Sciences*, 3 credit hours)

As with the weather forecasting and climatology concentrations, several additional courses provide prerequisites for the courses necessary to meet CBM requirements, including ATMS 103 (*Introduction to Meteorology*), ATMS 203 (*Foundations of Atmospheric Science I*), and ATMS 204 (*Foundations of Atmospheric Science II*). Eligibility for the CBM certification program alone requires 66 credit hours of coursework and associated prerequisites. Outside courses DRAM 213 (*Public Speaking/Presentations*) and MCOM 201 (*Basic Journalism*), both of which are part of the current curriculum, teach critical skills for a career in broadcast meteorology. While these courses are not specifically required for CBM eligibility, DRAM 213 contributes toward “an appropriate level of coursework in communication” and the faculty in the Department of Atmospheric Sciences agree that it remains important to keep both of these courses in the revised curriculum in order for our graduates to build a strong foundation for success. We also agree that ATMS 411 (*Synoptic Meteorology II*) completes the two-course synoptic meteorology sequence and covers topics that should not be left out of any accredited atmospheric sciences degree program. While not specifically required for CBM eligibility, we have therefore chosen to keep ATMS 411 in the list of required courses. Combined with the current PHYS 222 (*Physics II*) and VMP 205 (*Basic Video Production*) courses that are part of the current curriculum, this brings the potential credit hours for the major up to 80, which is too high. In conversations with professional broadcast meteorologists, we have determined that knowledge of video production techniques, while useful, is not a requirement for employment and can be learned on the job. We have therefore opted to remove VMP 205 (*Basic Video Production*) from the list of required courses in the current curriculum and listed it instead as a recommendation. In addition, PHYS 222 is not required for CBM eligibility and has been removed from the list of required ATMS core courses. The total required number of credit hours for the proposed broadcast meteorology concentration further reduces to 72. This is the lowest possible number of credit hours that will meet CBM requirements and give our students the necessary background for a successful career in broadcast meteorology.

3. Selection of Peer Institutions

In preparation for a previous petition for exemption to SD2015F in 2019, the Department of Atmospheric Sciences provided a list of undergraduate-only institutions that offer a degree in meteorology or a related field to Dr. Marietta Cameron during her time as chair of the Academic Policies Committee. Dr. Cameron in turn provided a list of 23 institutions for the department to consider as UNC Asheville peer institutions for comparison. There are no schools that appear on both lists. Dr. Cameron suggested that the department provide a comparison of six institutions from the meteorology list, including four or more that meet NWS requirements for employment and two that do not meet those requirements. She also suggested that we include a comparison of liberal arts schools. In response to a draft of the current petition, Dr. Andrew Laughlin, present chair of the Academic Policies Committee, suggested that we also select three additional schools that specifically offer a broadcast meteorology concentration.

The ATMS faculty selected the following institutions for comparison:

Valparaiso University*

St. Cloud State University

SUNY-Oswego

Millersville University

University of Vermont Lyndon* (formerly Lyndon State College or Northern Vermont University–Lyndon)

Northland College*

Metropolitan State University of Denver (MSUD)

Marshall University*

Western Connecticut State University*

Mississippi State

Starred (*) institutions are traditional liberal arts schools. Northland College, Marshall University, and Mississippi State offer at least one meteorology-related program that *does not* satisfy NWS employment criteria. Marshall University, Western Connecticut State University, and Mississippi State all offer graduate programs or certificates. All other schools are primarily undergraduate institutions. Although ATMS believes that this list provides a suitable comparison to our curriculum, the department notes that the comparative results would likely be very similar for any other list of schools with meteorology programs, since most are designed to fulfill GS-1340 requirements.

4. Peer Institution Comparisons

a. Credit hours required for degree

Table 3 shows the number of credit hours required to earn a degree in meteorology at each peer institution for each concentration or course of study. Requirements for each institution were gleaned from their respective websites and have not been verified more formally. The URLs for each program's website appear in Appendix B. The number of credit hours is separated by core department prefixed courses and required classes outside of the major department. Table 3 lists only the minimum number of credit hours in cases where schools specify a range of required credit hours. Please note that the Northland College, Marshall University B.S. in Geography with a weather broadcasting area of emphasis, and Mississippi State University B.S. in Broadcast Meteorology programs do not satisfy GS-1340 requirements.

Figure 1 provides a graphical representation of the same data shown in Table 3. The required number of credit hours for an atmospheric sciences degree at UNC Asheville is comparable to or less than the requirements at peer institutions. Note that the minimum number of credit hours for a degree at Valparaiso University as listed in Table 3 is insufficient to satisfy GS-1340 requirements (a student would need to add a course in physical meteorology and at least two courses outside the major for a minimum of 9 additional credits). **The UNC Asheville atmospheric sciences degree with a concentration in either weather forecasting or climatology therefore completely satisfies the GS-1340 requirements with the lowest number of credit hours of any peer institution.** The mean number of credit hours required by peer institutions—including different concentrations as separate programs and *excluding* UNC Asheville—is 75.8, which exceeds the course load of all three ATMS concentrations by 1 to 2 courses. The median number of credit hours at this collection of peer institutions is 77.5, again excluding the three atmospheric sciences concentrations at UNC Asheville.

Institution	CH (Dept)	CH (Other)	Total CH
Marshall University (B.S. Geography, Weather Broadcasting Area of Emphasis)	46	6	52
Valparaiso University	40	23	63
Northland College	32	35	67
UNC Asheville: Weather Forecasting	43	26	69
UNC Asheville: Climatology	43	26	69
UNC Asheville: Broadcast Meteorology (proposed)	46	26	72
Vermont St. Univ. Lyndon (Atmospheric Science/Graduate)	39	34	73
Vermont St. Univ. Lyndon (Atmospheric Science/Broadcast)	39	36	75
Vermont St. Univ. Lyndon (Atmospheric Science/Climate)	39	37	76
Vermont St. Univ. Lyndon (Atmospheric Science/NWS)	39	37	76
SUNY-Oswego	38	39	77
St. Cloud State University	46	32	78
Mississippi State University (B.S. Professional Meteorology)	50	28	78
Mississippi State University (B.S. Broadcast Meteorology)	51	27	78
MSUD (B.S. Meteorology)	43	37	80
Western Connecticut State Univ. (B.S. Meteorology, General)	36	45	81
Millersville University	38	44	82
Marshall University (B.S. Geography, Meteorology Area of Emphasis)	47	40	87
Western Connecticut State Univ. (B.S. Meteorology, Broadcast Meteorology)	42	48	90

Table 3: Required credit hours for an atmospheric sciences/meteorology degree by institution.

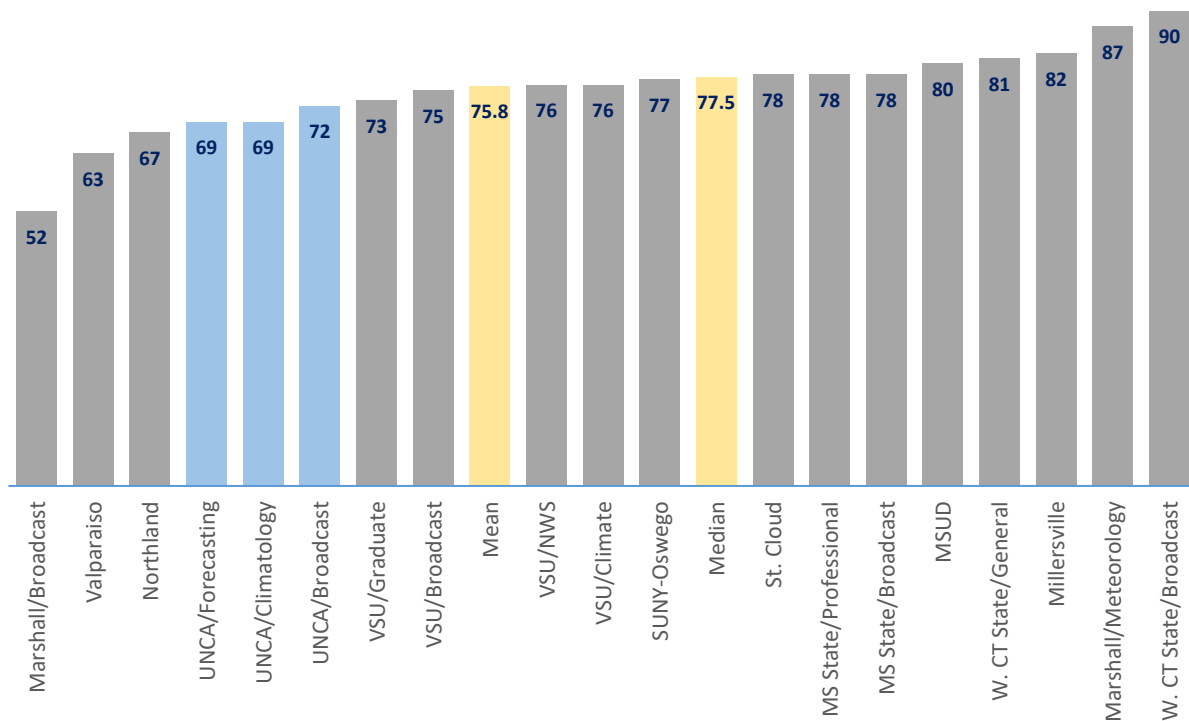


Figure 1: Graphical representation of data presented in Table 3. Note that the ATMS program credit hour requirements are lower than both the peer mean and median.

b. Time to graduation

There are no readily available data to assess the time to graduation for each of the peer institutions. However, despite the academic rigor of the ATMS course of study and the significant requirements of the Liberal Arts Core at UNC Asheville, our students traditionally complete our program in significantly less time than the average of other departments on campus. Despite requiring the second largest number of credit hours of any department at UNC Asheville (behind Engineering/Mechatronics), *the average time to graduation with a degree in atmospheric sciences for traditional undergraduate students according to 2013–2018 institutional data was the lowest of all departments on campus at only 4.1 years*. Compare this with the same 2013–2018 institutional data that show an average time to graduation of 4.4 years for all students at UNC Asheville. Considering the more recent pandemic years 2018 to 2023, the ATMS average time to graduation was 4.2 years compared with 4.2 years at UNC Asheville overall. Clearly, the number of credit hours required of ATMS students does not constitute an unreasonable financial or academic burden.

5. Four-Year Curriculum Plan

Table 4 shows a tentative four-year semester-by-semester plan of course offerings and instructors. Historically, ATMS has used very few adjunct instructors to cover its curriculum, even with professional development and family leave among the faculty (Hennon in 2014, Huang in 2017, and Godfrey in 2018–2019). Please note that half of the four current faculty members are new to the Department of Atmospheric Sciences as of Fall 2023 and the department has not yet assigned them specific courses, so

many of these course assignments may change depending on faculty preferences and student needs. In addition, Dr. Couzo very recently announced that he is leaving UNC Asheville, so the schedule shown in Table 4 represents the courses that the department can offer with only three faculty members. While Dr.

Fall 2024		Spring 2025		Fall 2025		Spring 2026	
ATMS 103	Miller	ATMS 103	Miller	ATMS 103	Miller	ATMS 103	Miller
ATMS 103	Miller	ATMS 103	Crossett	ATMS 103	Crossett	ATMS 103	Crossett
ATMS 103	Crossett	ATMS 201	Godfrey	ATMS 103	Crossett	ATMS 201	Godfrey
ATMS 111	Miller	ATMS 204	Crossett	ATMS 111	Miller	ATMS 204	Godfrey
ATMS 201	Godfrey	ATMS 310	Miller	ATMS 201	Godfrey	ATMS 310	Miller
ATMS 203	Godfrey	ATMS 325	Crossett	ATMS 203	Godfrey	ATMS 316	Miller
ATMS 235	Couzo*	ATMS 350	Godfrey	ATMS 223	Crossett	ATMS 328	Adjunct
ATMS 305	Godfrey	ATMS 405	Godfrey	ATMS 235	Miller	ATMS 350	Godfrey
ATMS 320	Godfrey	ATMS 411	Miller	ATMS 305	Godfrey	ATMS 355	Crossett
ATMS 326	Couzo*	ATMS 455	Godfrey	ATMS 315	Crossett	ATMS 411	Miller
ATMS 345	Crossett	Elective	Miller	ATMS 320	Godfrey	ATMS 420	Crossett
ATMS 383	Crossett	Elective	Crossett	ATMS 410	Miller	ATMS 455	Godfrey
ATMS 410	Miller	ATMS 499	Various	ATMS 464	Adjunct	Elective	Crossett
ATMS 464	Crossett			ATMS 499	Various	ATMS 499	Various
ATMS 499	Various**						
FYS 178	Couzo*						

* Dr. Couzo is leaving UNC Asheville after Fall 2024. The department can absorb the loss in ATMS teaching load by rebalancing contributions to electives and first-year seminars in the short term.

** ATMS 499 is the undergraduate research section. Each faculty member mentors research students.

Fall 2026		Spring 2027		Fall 2027		Spring 2028	
ATMS 103	Miller	ATMS 103	Miller	ATMS 103	Miller	ATMS 103	Miller
ATMS 103	Crossett	ATMS 103	Crossett	ATMS 103	Crossett	ATMS 103	Crossett
ATMS 111	Miller	ATMS 201	Godfrey	ATMS 103	Crossett	ATMS 201	Godfrey
ATMS 201	Godfrey	ATMS 204	Crossett	ATMS 111	Miller	ATMS 204	Godfrey
ATMS 203	Godfrey	ATMS 310	Miller	ATMS 201	Godfrey	ATMS 310	Miller
ATMS 235	Crossett	ATMS 325	Crossett	ATMS 203	Godfrey	ATMS 316	Miller
ATMS 305	Godfrey	ATMS 350	Godfrey	ATMS 223	Crossett	ATMS 328	Adjunct
ATMS 320	Godfrey	ATMS 405	Godfrey	ATMS 235	Miller	ATMS 350	Godfrey
ATMS 345	Crossett	ATMS 411	Miller	ATMS 305	Godfrey	ATMS 355	Crossett
ATMS 410	Miller	ATMS 455	Godfrey	ATMS 315	Crossett	ATMS 411	Miller
ATMS 464	Adjunct	Elective	Miller	ATMS 320	Godfrey	ATMS 420	Crossett
Elective	Miller	Elective	Crossett	ATMS 410	Miller	ATMS 455	Godfrey
Elective	Crossett	ATMS 499	Various	ATMS 464	Adjunct	Elective	Crossett
ATMS 499	Various**			ATMS 499	Various	ATMS 499	Various

Table 4: ATMS four-year course offering and staffing plan. The tentative schedules for Fall 2026 to Spring 2028 repeat those shown for Fall 2024 to Spring 2026 since the department presently anticipates no major changes to course offerings.

Couzo's absence will not impact the department's ability to deliver the core curriculum with the help of an adjunct instructor on occasion, a strong and national-recognized atmospheric sciences department should have more than three faculty members. The department expects to request a future fourth faculty position as resources allow to provide students with additional elective options each semester. Titles and descriptions for all courses except the proposed ATMS 235 (*Python for Atmospheric Scientists*) appear on the ATMS website at <https://atms.unca.edu/academics/courses-and-syllabi>.

Table 4 does not list ATMS 381, ATMS 382, ATMS 383, or ATMS 490. These are internship courses that carry various credit hours. Typically, one faculty member will be listed as the instructor for all of these courses.

Appendix A

Pathways to graduation for each UNC Asheville atmospheric sciences major concentration

**Pathway to Graduation: Bachelor of Science in Atmospheric Sciences
(Weather Forecasting Concentration)**

Year One			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 103 (Intro. to Met.)	3	• CHEM 132 (Gen. Chemistry)	3
• MATH 191 (Calculus I)	4	• MATH 192 (Calculus II)	4
• LANG 120 (Academic Writing)	4	• HUM 124	4
• FYS 178 (First-year seminar)	3	• Foreign Language 1 (or placement)	4
Total credit hours	14	Total credit hours	15
Year Two			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 203 (Fnd. of Atmos. Sci. I)	2	• ATMS 204 (Fnd. of Atmos. Sci. II)	2
• MATH 291 (Calculus III)	4	• HUM 214	4
• PHYS 221 (Physics I)	4	• MATH 394 (Differential Eqs.)	3
• ATMS 230 / CSCI 183 / Python	3	• PHYS 222 (Physics II)	4
• Foreign Language 2	4	• Elective	3
Total credit hours	17	Total credit hours	16
Year Three			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 305 (Atmos. Thermo.)	3	• ATMS 310 (Atmos. Dynamics)	3
• ATMS 320 (Met. Instruments)	3	• ATMS 350 (Weather Forecasting)	3
• ATMS 464 (Sci. Writing)	3	• LA 378 (DI-R)	4
• ATMS Wx Fcst Elective	3	• Elective or Social Science	3
• Diversity Intensive	3		
Total credit hours	15	Total credit hours	13
Year Four			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 410 (Synoptic I)	3	• ATMS 411 (Synoptic II)	3
• ATMS Elective	3	• ATMS 455 (Physical Met.)	3
• Arts and Ideas	3	• ATMS Wx Fcst Elective	3
• Elective or Social Science	3	• Elective	3
• HUM 414 / LA 478	4	• Elective	2
Total credit hours	16	Total credit hours	14

NOTES:

- Students in the weather forecasting concentration must choose two of the following elective courses: ATMS 223, ATMS 355, ATMS 405, or ENVR 338.
- Consult the list of approved courses to satisfy the social science, arts and ideas, and diversity intensive Liberal Arts Core requirements. Many students choose either ENVR 324 or a designated course with an ATMS prefix to satisfy the diversity intensive requirement.
- Refer to the current catalog for the frequency of elective course offerings (some courses are offered every other year or on a Fall/Spring rotation) and specific prerequisite requirements for each course. While you may use the above as a planning tool, please work with your academic advisor to create a customized plan to meet your needs and graduation timeline.
- LA 378 satisfies *both* the DI-R and the HUM 324 Liberal Arts Core requirements. Students who choose to enroll in HUM 324 must also complete a separate DI-R course in place of an elective.
- Students who wish to enroll in MATH 191 must either have college credit for pre-calculus (MATH 167) *or* take the math placement exam via OnePort.
- If possible, general electives can be taken at any time in consultation with your academic advisor. One of the electives can be a 2-hour or a 3-hour course. Thus, the total hours to degree could vary from 120 to 121.

Degree Requirements:

- Credits in the major and correlate courses: 69 HOURS
- Required major/correlate courses that also fulfill LAC requirements: 11 HOURS

**Pathway to Graduation: Bachelor of Science in Atmospheric Sciences
(Climatology Concentration)**

Year One			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 103 (Intro. to Met.)	3	• CHEM 132 (Gen. Chemistry)	3
• MATH 191 (Calculus I)	4	• MATH 192 (Calculus II)	4
• LANG 120 (Academic Writing)	4	• HUM 124	4
• FYS 178 (First-year seminar)	3	• Foreign Language 1 (or placement)	4
Total credit hours	14	Total credit hours	15
Year Two			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 203 (Fnd. of Atmos. Sci. I)	2	• ATMS 204 (Fnd. of Atmos. Sci. II)	2
• ATMS 230 / CSCI 183 / Python	3	• HUM 214	4
• MATH 291 (Calculus III)	4	• MATH 394 (Differential Eqs.)	3
• PHYS 221 (Physics I)	4	• PHYS 222 (Physics II)	4
• Foreign Language 2	4	• Elective	3
Total credit hours	17	Total credit hours	16
Year Three			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 305 (Atmos. Thermo.)	3	• ATMS 310 (Atmos. Dynamics)	3
• ATMS 320 (Met. Instruments)	3	• Elective or Social Science	3
• ATMS 464 (Sci. Writing)	3	• ATMS 405 (Met. Statistics)	3
• ATMS 223 (Phys. Climatol.)	3	• LA 378 (DI-R)	4
• Diversity Intensive	3		
Total credit hours	15	Total credit hours	13
Year Four			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 410 (Synoptic I)	3	• ATMS 411 (Synoptic II)	3
• ATMS Elective	3	• ATMS 420 (Applied Climatol.)	3
• Arts and Ideas	3	• ATMS 455 (Physical Met.)	3
• Elective or Social Science	3	• Elective	3
• HUM 414 / LA 478	4	• Elective	2
Total credit hours	16	Total credit hours	14

NOTES:

- Consult the list of approved courses to satisfy the social science, arts and ideas, and diversity intensive Liberal Arts Core requirements. Many students choose either ENVR 324 or a designated course with an ATMS prefix to satisfy the diversity intensive requirement.
- Refer to the current catalog for the frequency of elective course offerings (some courses are offered every other year or on a Fall/Spring rotation) and specific prerequisite requirements for each course. While you may use the above as a planning tool, please work with your academic advisor to create a customized plan to meet your needs and graduation timeline.
- LA 378 satisfies *both* the DI-R and the HUM 324 Liberal Arts Core requirements. Students who choose to enroll in HUM 324 must also complete a separate DI-R course in place of an elective.
- Students who wish to enroll in MATH 191 must either have college credit for pre-calculus (MATH 167) *or* take the math placement exam via OnePort.
- If possible, general electives can be taken at any time in consultation with your academic advisor. One of the electives can be a 2-hour or a 3-hour course. Thus, the total hours to degree could vary from 120 to 121.

Degree Requirements:

- Credits in the major and correlate courses: 69 HOURS
- Required major/correlate courses that also fulfill LAC requirements: 11 HOURS

**Pathway to Graduation: Bachelor of Science in Atmospheric Sciences
(Broadcast Meteorology Concentration)**

Year One			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 103 (Intro. to Met.)	3	• DRAM 213 (Public Speaking)	3
• MATH 191 (Calculus I)	4	• MATH 192 (Calculus II)	4
• LANG 120 (Academic Writing)	4	• HUM 124	4
• FYS 178 (First-year seminar)	3	• Foreign Language 1 (or placement)	4
Total credit hours	14	Total credit hours	15
Year Two			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 203 (Fnd. of Atmos. Sci. I)	2	• ATMS 204 (Fnd. of Atmos. Sci. II)	2
• MATH 291 (Calculus III)	4	• ATMS 328 (Broadcast Met.)	3
• PHYS 221 (Physics I)	4	• HUM 214	4
• ATMS 235 (Python) or CSCI 183	3	• Elective	3
• Foreign Language 2	4	• Elective	3
Total credit hours	17	Total credit hours	15
Year Three			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 305 (Atmos. Thermo.)	3	• ATMS 310 (Atmos. Dynamics)	3
• Social Science	3	• ATMS 350 (Weather Forecasting)	3
• ATMS 464 (Sci. Writing)	3	• LA 378 (DI-R)	4
• ATMS 223 (Physical Climatology)	3	• ATMS 316 (Mesoscale Met.)	3
• MCOM 201 (Basic Journalism)	4		
Total credit hours	16	Total credit hours	13
Year Four			
Fall Semester	Hours	Spring Semester	Hours
• ATMS 410 (Synoptic I)	3	• ATMS 411 (Synoptic II)	3
• ATMS 315 (Rad. & Sat.) or 320 (Instr.)	3	• ATMS 455 (Physical Met.)	3
• Diversity Intensive	3	• ATMS 405 (Met. Statistics)	3
• Arts and Ideas	3	• Research or Internship	3
• HUM 414 / LA 478	4	• Elective	3
Total credit hours	16	Total credit hours	15

NOTES:

- Additional recommended courses for students in the broadcast meteorology concentration include ATMS 326, 345, 355, or 420; PHYS 222; and broadcast journalism courses.
- Consult the list of approved courses to satisfy the social science, arts and ideas, and diversity intensive Liberal Arts Core requirements. Many students choose either ENVR 324 or a designated course with an ATMS prefix to satisfy the diversity intensive requirement. Broadcast meteorology students often choose MCOM 104 to satisfy the social science requirement.
- Refer to the current catalog for the frequency of elective course offerings (some courses are offered every other year or on a Fall/Spring rotation) and specific prerequisite requirements for each course. While you may use the above as a planning tool, please work with your academic advisor to create a customized plan to meet your needs and graduation timeline.
- LA 378 satisfies *both* the DI-R and the HUM 324 Liberal Arts Core requirements. Students who choose to enroll in HUM 324 must also complete a separate DI-R course in place of an elective.
- Students who wish to enroll in MATH 191 must either have college credit for pre-calculus (MATH 167) *or* take the math placement exam via OnePort.
- If possible, general electives can be taken at any time in consultation with your academic advisor.

Degree Requirements:

- Credits in the major and correlate courses: 72 HOURS
- Required major/correlate courses that also fulfill LAC requirements: 11 HOURS

Appendix B

Websites for peer institution atmospheric sciences or meteorology degree programs

Marshall University

<https://www.marshall.edu/geography/meteorology-geography/>

Metropolitan State University of Denver (MSUD)

https://catalog.msudenver.edu/preview_program.php?catoid=23&poid=5485&returnto=1306

Millersville University

<https://www.millersville.edu/esci/meteorology/degreeinfo.php>

Mississippi State University

<https://www.geosciences.msstate.edu/undergraduate/meteorology/>

Northland College

https://catalog.northland.edu/preview_program.php?catoid=17&poid=1162&returnto=809

St. Cloud State University

<https://catalog.stcloudstate.edu/programs/iAA082ufMFL6AXJesb5>

SUNY-Oswego

https://catalog.oswego.edu/preview_program.php?catoid=36&poid=4303

Valparaiso University

<https://www.valpo.edu/geography-meteorology/meteorology-major/degree-programs/>

Vermont State University Lyndon

https://catalog.vermontstate.edu/preview_program.php?catoid=4&poid=1780

Western Connecticut State University

https://catalogs.wcsu.edu/ugrad/sas/programs/physics-astronomy-meteorology/#bs_mtr