

Bachelor of Science in Atmospheric Science

This degree is designed to meet the recommendations of the American Meteorological Society for a bachelor's degree in meteorology/atmospheric science. There are four options, each of which meet these recommendations.

Atmospheric Science

This major is for students who want a broad background in atmospheric science. It is also the most suitable option for those who are aiming at a career in weather forecasting. It includes a third semester of synoptic meteorology as well as an air pollution course.

Air Pollution Concentration

Students prepare for a career emphasizing environmental aspects of meteorology. This option includes an additional semester of chemistry as well as environmental studies.

Hydrometeorology Concentration

Students prepare for a career involving the interface between meteorology and hydrology. These studies have important applications to flash floods, droughts and water supply. This option includes additional courses on fluid flow and hydrology from the School of Engineering.

News Media Concentration

This option is for students who wish to enter careers whose main function is to provide information to the general public. It requires additional courses from the School of Journalism.

Undergraduate Admission

Admission to KU

All students applying for admission must send high school and college transcripts to the Office of Admissions. Prospective first-year students should be aware that KU has qualified admission requirements that all new first-year students must meet to be admitted. Consult the Office of Admissions (<http://admissions.ku.edu/>) for application deadlines and specific admission requirements.

Visit the International Support Services (<http://www.iss.ku.edu/>) for information about international admissions.

Students considering transferring to KU may see how their college-level course work will transfer on the Office of the University Registrar (<https://registrar.ku.edu/credittransfer/>) website.

Advising

Students majoring in atmospheric science are encouraged to consult their academic advisor as soon as possible about the selection of courses and to create an academic plan. It is strongly recommended that students consult with an advisor on a regular basis to make certain that, at each stage in their program, they are meeting all of the requirements for the degree. Faculty advisors are also available to discuss career planning.

Requirements for the B.S. Degree in Atmospheric Science

The Atmospheric Science major satisfies all the professional meteorology requirements for employment with the National Weather Service (Meteorology Series 1340) as well as many other positions in the private sector. There are four concentrations. The **general meteorology** concentration is the most common option and provides a well-rounded program. The **air pollution meteorology** concentration emphasizes the dispersion of pollution in the atmosphere and the chemical processes impacting air pollution. The **hydrometeorology** concentration focuses on the interface between meteorology and hydrology that is important for flash floods, droughts, agriculture, and water resource management. The **news media forecasting** concentration includes extra training useful for a career in broadcast meteorology. The B.S. degree with any of these concentrations also prepares students to begin graduate programs in meteorology or atmospheric science.

Code	Title	Hours
Atmospheric Science Prerequisite or Co-requisite Knowledge		
Majors must complete courses as specified in each of the following areas. Honors students are advised to take honors courses when eligible. These hours do not contribute to the minimum number of hours required for the major.		
Computing and Programming. Satisfied by the following:		
EECS 138	Introduction to Computing: _____ (Python preferred)	3
GEOG 358	Introduction to Geographic Information Systems	4
Introduction to Physical Geography. Satisfied by the following:		
GEOG 104	Introduction to Physical Geography	3
Foundations of Chemistry I. Satisfied by the following:		
CHEM 130	General Chemistry I	5
	or CHEM 190 Foundations of Chemistry I, Honors & CHEM 191 and Foundations of Chemistry I Laboratory, Honors	
General Physics I. Satisfied by the following:		
PHSX 211	General Physics I	2-5
	& PHSX 216 and General Physics I Laboratory	
PHSX 213	General Physics I Honors	1-5
General Physics II. Satisfied by one of the following:		
PHSX 212	General Physics II	2-4
	& PHSX 236 and General Physics II Laboratory	
PHSX 214	General Physics II Honors	1-4
Calculus I. Satisfied by one of the following:		
MATH 125	Calculus I	4
	or MATH 145 Calculus I, Honors	
Equivalent		
Calculus II. Satisfied by one of the following:		
MATH 126	Calculus II	4
	or MATH 146 Calculus II, Honors	
Equivalent		
Vector Calculus. Satisfied by the following:		
MATH 127	Calculus III	4
	or MATH 147 Calculus III, Honors	
Elementary Linear Algebra. Satisfied by the following:		
MATH 290	Elementary Linear Algebra	2

or MATH 291	Elementary Linear Algebra, Honors	
Applied Differential Equation. Satisfied by the following:		
MATH 320	Elementary Differential Equations	3
or MATH 220	Applied Differential Equations	
Numerical Methods. Satisfied by the following:		
MATH 581	Numerical Methods	3
Statistics. Satisfied by the following:		
MATH 526	Applied Mathematical Statistics I	3
or BSAN 202	Statistics	

Code	Title	Hours
Atmospheric Science Core Knowledge and Skills		
Majors must complete all of the following:		
Introductory Meteorology. Satisfied by:		
ATMO 105	Introductory Meteorology	5
or ATMO 106	Introductory Meteorology, Honors	
Climate and Climate Change. Satisfied by:		
ATMO 321	Climate and Climate Change	3
Weather Forecasting. Satisfied by:		
ATMO 505	Weather Forecasting	3
Microclimatology. Satisfied by:		
ATMO 521	Microclimatology	3
Synoptic Meteorology. Satisfied by:		
ATMO 630	Synoptic Meteorology	3
Dynamic Meteorology. Satisfied by:		
ATMO 640	Dynamic Meteorology	3
Remote Sensing. Satisfied by:		
ATMO 642	Remote Sensing	3
Advanced Dynamic Meteorology. Satisfied by:		
ATMO 660	Advanced Dynamic Meteorology	3
Physical Meteorology. Satisfied by:		
ATMO 680	Physical Meteorology	3
Capstone Course		
Seminar for Seniors. Satisfied by:		
ATMO 697	Seminar for Seniors	1
Concentration Course Work		
Satisfied by completing coursework in one of the concentrations below.		9-17
Total Hours		39-47

Concentrations

Choose one of the following concentrations. All concentrations satisfy the federal requirements for employment as a meteorologist and will also prepare students to begin graduate programs in meteorology or atmospheric science.

Code	Title	Hours
General Meteorology Concentration		
Air Pollution Meteorology. Satisfied by:		
ATMO 525	Air Pollution Meteorology	3
Operational Forecasting. Satisfied by:		
ATMO 605	Operational Forecasting	2
Advanced Synoptic Meteorology. Satisfied by:		

ATMO 650	Advanced Synoptic Meteorology	3
Total Hours		8

Code	Title	Hours
Air Pollution Meteorology Concentration		
Air Pollution Meteorology. Satisfied by:		
ATMO 525	Air Pollution Meteorology	3
Foundations of Chemistry II. Satisfied by:		
CHEM 135	General Chemistry II	5
or CHEM 195	Foundations of Chemistry II, Honors	
& CHEM 196	and Foundations of Chemistry II Laboratory, Honors	
Introduction to Environmental Engineering and Science. Satisfied by:		
CE 477	Introduction to Environmental Engineering and Science	3
Total Hours		11

Code	Title	Hours
Hydrometeorology Concentration		
Air Pollution Meteorology. Satisfied by:		
ATMO 525	Air Pollution Meteorology	3
Operational Forecasting. Satisfied by:		
ATMO 605	Operational Forecasting	2
Statics and Dynamics. Satisfied by:		
CE 260	Statics and Dynamics	5
Fluid Mechanics. Satisfied by:		
CE 330	Fluid Mechanics	3
Hydrology. Satisfied by:		
CE 455	Hydrology	3
Total Hours		16

Code	Title	Hours
News Media Forecasting Concentration		
Operational Forecasting. Satisfied by:		
ATMO 605	Operational Forecasting	2
Advanced Synoptic Meteorology. Satisfied by:		
ATMO 650	Advanced Synoptic Meteorology	3
Information Exploration. Satisfied by:		
JMC 302	Information Exploration	3
Media Writing. Satisfied by:		
JMC 304	Media Writing for Audiences	3
Multimedia Reporting. Satisfied by:		
JMC 415	Multimedia Reporting	3
Total Hours		14

Major Hours & Major GPA

While completing all required courses (above), majors must also meet each of the following hour and grade-point average minimum standards:

Major Hours in Residence

Satisfied by a minimum of 15 hours of KU resident credit in the major.

Major Junior/Senior (300+) Hours

Satisfied by a minimum of 30 hours from junior/senior courses (300+) in the major.

Major Junior/Senior (300+) Graduation GPA

Satisfied by a minimum of a 2.0 KU GPA in junior/senior courses (300+) in the major. GPA calculations include all junior/senior courses in the field of study including F's and repeated courses. See the Semester/Cumulative GPA Calculator (<https://sis.ku.edu/gpa-calculator/>).

Sample 4-year plans for the Bachelor of Science in Atmospheric Science can be found here: BS in Atmospheric Science (<https://catalog.ku.edu/liberal-arts-sciences/geography/bs-atmospheric-science/bs-atmospheric-science/>) (no concentration), concentration in Air Pollution Meteorology (<https://catalog.ku.edu/liberal-arts-sciences/geography/bs-atmospheric-science/air-pollution-meterology-conc/>), concentration in Hydrometeorology (<https://catalog.ku.edu/liberal-arts-sciences/geography/bs-atmospheric-science/hydrometeorology-conc/>), concentration in News Media Forecasting (<https://catalog.ku.edu/liberal-arts-sciences/geography/bs-atmospheric-science/news-media-forecasting-conc/>) or by using the left-side navigation.

At the completion of this program, students will be able to:

- Demonstrate mastery of the fundamental principles governing the atmosphere and apply diagnostic, prognostic, and technological tools to evaluate atmospheric processes across spatial and temporal scales.
- Work with observations or model data by applying mathematical and statistical techniques through scientific programming or meteorological software packages.
- Effectively communicate scientific information related to weather and climate in oral and written form at an appropriate level for their audience.
- Create, synthesize, or apply knowledge within the atmospheric sciences or between the atmospheric sciences and other disciplines throughout the degree program culminating in a capstone experience.

Departmental Honors in Atmospheric Science

To be accepted as a candidate for honors, an undergraduate major must have completed at least 9 hours of upper-division credit in atmospheric science with a grade-point average of 3.5 in all atmospheric science courses. In addition, the program requires ATMO 499, an independent study course consisting of the creation of an honors paper. The student presents the results of this paper in an oral examination to a committee of a minimum of 2 faculty members, normally from the geography department, and chaired by the ATMO 499 supervisor. To graduate with honors, the student must complete the paper and the examination and maintain the 3.5 grade-point average.