

Master of Science in Atmospheric Science

The M.S. program in Atmospheric Science expands the student's knowledge of fundamental atmospheric processes and how the atmosphere interacts with other parts of the environment. Atmospheric Science at KU is the only one of its kind in the state and has a unique interdisciplinary nature that pursues cutting-edge research and quality education that combines theory, modeling, diagnostic studies, and applications to generate solutions that make a real difference in people's lives. Students become familiar with quantitative research methods and how these various approaches can be used to address different problems in atmospheric science. Students gain an in depth ability to learn specific skills and apply them toward their thesis work. These skills consist of, for example, statistical analysis techniques, numerical modeling, or work with atmospheric instrumentation. The breadth of the program and the diverse research topics explored by the faculty are able to accommodate students with a variety of interests.

For more information, visit our website (<http://geog.ku.edu/>).

Admission to Graduate Studies

Admission Requirements

- All applicants must meet the requirements outlined in the Admission to Graduate Study (<https://policy.ku.edu/graduate-studies/admission-to-graduate-study/>) policy.
- Bachelor's degree: A copy of official transcripts showing proof of a bachelor's degree (and any post-bachelor's coursework or degrees) from a regionally accredited institution, or a foreign university with equivalent bachelor's degree requirements is required.
- English proficiency: Proof of English proficiency (<https://gradapply.ku.edu/english-requirements/>) for non-native or non-native-like English speakers is required. There are two bands of English proficiency, including Admission and Full proficiency. For applicants to online programs, Full proficiency is required.

Graduate Admission

Entering students are expected to have completed an undergraduate degree in a physical science (e.g., atmospheric science, oceanography, geology, physics, or chemistry), mathematics, or engineering. Additionally, students are expected to have studied mathematics, including vector calculus and ordinary differential equations. Courses taken to remedy deficiencies may not count toward graduate degrees.

The following items must be received to complete the application file:

1. **A completed Graduate Application Form found on the Graduate Admissions website.**
2. **A current resume/CV.**
3. **A Statement of Interest and Goals.** This is included in the on-line application form. The Graduate Studies Committee places considerable importance on the thoughtfulness of your remarks – in particular, we are interested in learning about (1) your specific interests within atmospheric science and why they are important and interesting to you, (2) what you envision as your educational and career objectives and how an Atmospheric Science degree from KU

helps to meet those objectives, and (3) which of our faculty members you think would be an appropriate graduate advisor and mentor.

4. **A scanned copy of an official transcript** can be uploaded at the time of application. Official, degree conferred transcripts will be required prior to the second semester of study. NOTE: Documents uploaded with your application are not considered official. KU does not consider transcripts that come from applicants or that have been in the applicant's possession as official.
5. **Three confidential letters of recommendation** sent by referees who are familiar with your academic and/or professional activities and who can address your likelihood of success in graduate school. If possible, we prefer letters from professors, but applicants returning to school after a lengthy absence may substitute letters from supervisors. Note that it is the responsibility of the applicant to request and to confirm that the required letters have been sent by the deadline. When using the on-line reference form to list references, you must include valid e-mail addresses. Once you have completed and submitted your application, your references will be contacted directly via email with directions for submitting their letters of recommendation.

****Graduate Record Examination (GRE) scores are not required for the application. Applicants may choose to submit GRE scores if they feel it will help inform the department of their academic abilities. However, choosing not to submit scores will not affect your chances of admission.****

NON-DEGREE SEEKING STUDENTS

Non-degree seeking students (NDS) are admitted on a rolling basis and must submit an online application (<https://gradapply.ku.edu/apply/>). Applications are accepted on a rolling basis. Applicants must include the materials below in their application.

1. Copy of official transcripts including proof of a bachelor's degree.
2. Proof of English proficiency, if it is a second language.
3. Statement of purpose and interests.

Submit your graduate application online (<https://gradapply.ku.edu/apply/>). For questions, contact:

The Graduate Program Coordinator

Atmospheric Science M.S. Degree Requirements

The purpose of the program is to expand the student's knowledge of fundamental atmospheric processes and how the atmosphere interacts with other parts of the environment. Students become familiar with quantitative research methods and how these various approaches can be used to address different problems in atmospheric science. Students gain an in depth ability to learn specific skills and apply them toward their thesis work. These skills consist of, for example, statistical analysis techniques, numerical modeling, or work with atmospheric instrumentation. The breadth of the program and the diverse research topics explored by the faculty are able to accommodate students with a variety of interests.

Code	Title	Hours
ATMO 710	Atmospheric Dynamics	3
ATMO 720	Atmospheric Modeling	3
GEOG 716	Advanced Geostatistics	3

Attend the Department's New Graduate Student Orientation (non-credit)		
GEOG 980	Seminar in Geography: _____ (Colloquium for 1 credit hour during each of the first 2 semesters of residence at KU.)	2
Select 3 credit hours of electives in atmospheric science electives at the 700 level or above		3
Select 6 credit hours of electives at the 500 level or above outside the geography department. These courses will be chosen in consultation with the student's advisor.		6
A maximum of 6 hours of 500- and 600-level atmospheric science courses may be included in the program, excluding ATMO 505		6
ATMO 899	Master's Thesis	4
Total Hours		30

Code	Title	Hours
Electives Course Options: Electives are selected with approval from the advisor and are tailored to fit the needs of the individual student, and may include other classes outside this list		
ATMO 521	Microclimatology	3
ATMO 525	Air Pollution Meteorology	3
ATMO 605	Operational Forecasting	2
ATMO 615	Tropical Meteorology	3
ATMO 630	Synoptic Meteorology	3
ATMO 634	Physical Climatology	3
ATMO 640	Dynamic Meteorology	3
ATMO 642	Remote Sensing	3
ATMO 650	Advanced Synoptic Meteorology	3
ATMO 660	Advanced Dynamic Meteorology	3
ATMO 680	Physical Meteorology	3
ATMO 690	Special Problems in Meteorology	1-3
ATMO 715	Tropical Meteorology	3
ATMO 725	Clouds, Climate and Precipitation	3
ATMO 731	Advanced Topics in Atmospheric Science: _____	1-3
ATMO 898	Readings in Atmospheric Science	1-4
GEOG 558	Spatial Data Analysis	4
MATH 647	Applied Partial Differential Equations	3
MATH 781	Numerical Analysis I	3
BIOL 594	Forest Ecosystems	3
CE 751	Physical Hydrology	3

Recommended: Non-credit 8-hour Responsible Scholarship seminar held before classes start in the spring semester.

Thesis

A master's thesis is a demonstration of a student's ability to formulate an atmospheric science research problem, collect and analyze relevant data, synthesize appropriate literature, arrive at logical conclusions, and present the entire exercise in a public academic forum. The thesis should address an original problem of scientific importance, though at the M.S. level, there will be significant guidance of the research by the faculty advisor.

Thesis proposal

During the second semester in the program, the student must submit to their committee a thesis research plan. All M.S thesis proposals are expected to contain three basic elements:

1. A statement of the research problem or questions to be investigated.
2. A survey of relevant literature and how it relates to the student's research problem
3. An outline of the general methodology, if not specific techniques, to be utilized in addressing the research problem or answering the basic research questions.

Two grades are possible for the proposal defense: "satisfactory" and "unsatisfactory". If the student receives a grade of unsatisfactory, the defense may be repeated once on the recommendation of the thesis committee. If the student receives an unsatisfactory grade a second time, they will be recommended for dismissal from the program. A minimum of 90 days must pass before the defense may be redone.

Thesis seminar and defense

Students are required to make a formal presentation to the faculty and fellow students in the form of a research seminar, and subsequently defend orally to their committee the results of their thesis research. Ideally, the final examination takes place immediately following the research seminar.

A majority of the committee members must approve the defense outcome. The possible outcomes for the defense are "honors", "satisfactory", or "unsatisfactory".

Students that fail the defense on their first attempt may repeat the defense at the recommendation of the degree program one more time. A minimum of 90 days must pass before the defense may be redone.

While completing degree requirements, graduate students are expected to understand and follow Office Graduate Studies policies (<https://ogs.ku.edu/policies/>) relevant to their student status and academic standing.

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

- Demonstrate mastery of the principles governing the atmosphere and apply diagnostic, prognostic, and technological tools to evaluate atmospheric processes across spatial and temporal scales and within most subdisciplines of Atmospheric Science.
- Work with data by applying mathematical and statistical techniques through scientific programming languages or meteorological software packages.
- Effectively communicate scientific information both broadly related to their discipline and also specific to their thesis/ dissertation in both oral and also written form at an appropriate level for their audience (e.g., for the general public and at professional conferences).
- Create, synthesize, or apply knowledge within the atmospheric sciences or between the atmospheric sciences and other disciplines throughout the degree program culminating in novel scientific results.