

Doctor of Philosophy in Atmospheric Science

Atmospheric Science is the study of weather and climate. The atmosphere is a key component of the environment and affects many human activities ranging from daily weather prediction to the understanding of climate and human health. Our program provides graduate students with the advanced training to address a host of meteorological and climate related issues facing humans today.

By the end of the program, Ph.D. students will be able to perform independent, creative research within their chosen sub-discipline. In addition to becoming an expert in their sub-discipline, students will obtain a solid background in the fundamentals of atmospheric physics and applied mathematics. The student's research will often require knowledge of subject fields outside of atmospheric science that is related to their dissertation, which could include oceanography, physics, geophysics, mathematics, statistics, engineering, or similar fields.

Early in their program, students will take fundamental courses in atmospheric science including atmospheric dynamics, numerical modeling, and advanced statistics. A majority of the student's time will be devoted to their research project.

KU offers a variety of specializations including:

Atmospheric dynamics
 Cloud microphysics
 Mesoscale organization of cloud systems
 Tropical meteorology
 Synoptic meteorology
 Mesoscale meteorology
 Coastal meteorology
 Climate variability and change
 Regional climatology
 Climate models
 Aerosol and dust emission
 Biometeorology
 Microclimatology
 Land-atmosphere interactions
 Remote sensing of the surface and atmosphere
 Polar ice caps

Admission to Graduate Studies

An applicant seeking to pursue graduate study in the College may be admitted as either a degree-seeking or non-degree seeking student. Policies and procedures of Graduate Studies govern the process of Graduate admission. These may be found in the Graduate Studies (<https://catalog.ku.edu/graduate-studies/>) section of the online catalog.

Please consult the Departments & Programs (<https://catalog.ku.edu/liberal-arts-sciences/>) section of the online catalog for information regarding program-specific admissions criteria and requirements. Special admissions requirements pertain to Interdisciplinary Studies degrees, which may be found in the Graduate Studies section of the online catalog.

Entering students are expected to have a M.S. degree in atmospheric science or in another physical science, mathematics or engineering. Entering students will be expected to have studied mathematics, including vector calculus and ordinary differential equations. They should also have

taken the equivalent of at least 2 semesters of calculus-based physics and one of chemistry.

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

1. **A completed** Graduate Application Form (<https://gradapply.ku.edu/apply/>) **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 a degree from KU Geography & Atmospheric Science 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.

ADDITIONAL REQUIREMENTS

Non-native speakers of English must meet English proficiency requirements (<https://gradapply.ku.edu/english-requirements/>).

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

The Graduate (<https://geog.ku.edu/staff/>) **Program Coordinator**

Upon a student's admission to the department, the Graduate Studies Committee (GSC) will appoint an advisor. Early in the first semester (preferably in the first week of classes), the student should meet with this advisor to outline a tentative program of coursework for the degree. Such programs should be solidified by the time of enrollment for the second semester and submitted to the GSC for approval. The student and advisor then continue to discuss and update programs each semester, bearing in mind that any substantive changes must be approved by the GSC.

| Code | Title | Hours |
|---|---|--------------|
| Core Courses | | |
| ATMO 710 | Atmospheric Dynamics | 3 |
| ATMO 720 | Atmospheric Modeling | 3 |
| GEOG 716 | Advanced Geostatistics | 3 |
| Attend 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 |
| 500 level and above courses in mathematics, engineering, or other research skill courses approved by student's committee | | 6 |
| Electives | | 15-24 |
| Electives are selected with approval of the committee and are tailored to fit the needs of the individual student (e.g. oriented to a subfield in meteorology, climatology, or other specializations) Sample courses include: | | |
| ATMO 731 | Advanced Topics in Atmospheric Science: _____ | |
| MATH 647 | Applied Partial Differential Equations | |
| MATH 781 | Numerical Analysis I | |
| GEOG 558 | Spatial Data Analysis | |
| BIOL 513 | Virology Laboratory | |
| BIOL 594 | Forest Ecosystems | |
| BIOL 841 | Biometry I | |
| CE 730 | Intermediate Fluid Mechanics | |
| CE 751 | Physical Hydrology | |
| Dissertation Research | | 30 |

RSRS Requirement

The Research Skill and Responsible Scholarship (RSRS) requirement will be met by 6 credits at the 500 level or above in mathematics and/or engineering. Alternatively, 6 credits at the 500 level or above in a related discipline which are approved by the student's graduate committee may also be used for the RSS requirement. The courses for the RSRS requirement must be taken during the PhD program. Students must participate in the department Responsible Scholarship Seminar.

Proposal/Oral Comp:

All candidates must pass a comprehensive written examination. Program sheets are available in the department office and must be filed before the oral examination can be scheduled. The comprehensive examination is scheduled when the student and the faculty advisor believe that competence in the specialty or specialties has been achieved. It consists of two parts: written questions submitted by the committee members and then oral examination. For the written questions, they may be open-book or closed at the discretion of the individual committee member submitting the questions, and the student normally will have up to 8 hours to complete each set of questions. In the oral section, students often are asked to elaborate and comment on their written answers. The focus is on the proposal, however, with probes into its scope, justification, and methodology being common.

Two grades are possible for the overall examination: "satisfactory," and "unsatisfactory." In the unsatisfactory case, the student may be allowed to repeat the process upon recommendation of the committee one more time. Such repetition can be undertaken no sooner than 90 days after the last exam. Approval from the Office of Graduate Studies must be secured

for the scheduling of this procedure and the request must be submitted two weeks prior to the proposed date for the examination.

Dissertation Requirements

The student must submit a dissertation approved by his/her graduate committee. All candidates must pass a final oral examination and must submit an approved dissertation to UMI. The dissertation will be defended in a public presentation.

Final Defense:

The student must complete an oral defense of their dissertation. A majority of the committee members must approve the defense with an assessment of "satisfactory", "unsatisfactory", or "honors".

Students that fail the defense on their first attempt may repeat the defense at the recommendation of the degree program one more time. Such repetition can be undertaken no sooner than 90 days after the last defense.

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

Handbook for Graduate Students

Further details regarding degree requirements can be found in the Department's Graduate Student Handbook.