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
- Micrometeorology
- 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 (http://catalog.ku.edu/graduate-studies) section of the online catalog.

Please consult the Departments & Programs (http://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. Graduate Record Examination scores are required of all applicants. Applicants should have a minimum Grade Point Average (GPA) of 3.0 on a 4.0 scale. Applicants with a GPA of less than 3.0 may be considered for admission on a probationary or provisional status.

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.

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### Code Title Hours

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Core Courses</strong></td>
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<tr>
<td>ATMO 710</td>
<td>Atmospheric Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ATMO 720</td>
<td>Atmospheric Modeling</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 716</td>
<td>Advanced Geostatistics</td>
<td>3</td>
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<tr>
<td>Two-day (non-credit) orientation before classes begin in the fall semester</td>
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<tr>
<td>GEOG 980</td>
<td>Seminar in Geography: _____ (Colloquium for 1 credit hour during each of the first 2 semesters of residence at KU.)</td>
<td>2</td>
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<tr>
<td>500 level and above courses in mathematics, engineering, or other research skill courses approved by student's committee</td>
<td>6</td>
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<tr>
<td><strong>Electives</strong></td>
<td>15-24</td>
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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 Intermediate Geographical Information Systems
- GEOG 758 Geographic Information Science
- GEOG 538 Soil Chemistry
- BIOL 513 Virology Laboratory
- BIOL 570 Introduction to Biostatistics
- BIOL 594 Forest Ecosystems
- BIOL 841 Biometry I
- CE 730 Intermediate Fluid Mechanics
- CE 751 Physical Hydrology
- CE 779 Water Quality

Dissertation Research 30

Comprehensive Examination Process

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 student will have a dissertation committee consisting of at least 5 faculty members. At least 4 of these faculty must regularly teach in the atmospheric sciences program. One of the faculty members on the committee must be from outside the geography and atmospheric science department.
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 existing Geography Department ethical scholarship program.

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.