

Atmospheric Sciences

Doctor of Philosophy

The Department of Atmospheric Sciences offers a graduate program leading to the degree of Doctor of Philosophy. This program is intended to prepare students to assume critical roles in leading research efforts, guiding science policy, educating future scientists, and creating opportunities in industry. Current UND atmospheric research is being conducted on clouds, radiation, and climate, polarimetric radar measurements, tropical waves, surface transportation weather, GIS/Remote Sensing, data assimilation, mesoscale numerical weather prediction, and tropical precipitation studies.

Admission Requirements

1. A master's degree from an accredited institution, normally in the field of proposed specialist or doctoral study.
2. A cumulative GPA of at least 3.00 for all undergraduate work.
3. A GPA of at least 3.00 in all graduate level work.
4. A combined score of 1050 in the quantitative and verbal sections of the Graduate Record Examination (GRE).
5. A minimum TOEFL Score of 550 on the paper-based test or 213 on the computer-based test, or for the Internet based TOEFL, a composite score of 79, with minimum scores of 21/30 (Speaking*); 19/30 (Listening); 19/30 (Reading); and 17/30 (Writing) for applicants whose native language is not English. Applicants may also meet language requirements by presenting IETLS scores of 6.5. *Applicants being considered for Graduate Teaching Assistantships must achieve these minimum TOEFL scores, but have a minimum score of 26/30 on the Speaking subtest.
6. Students who have received a bachelor's degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL. Applicants will be evaluated on an individual basis and those with limited backgrounds in the aforementioned areas (physics, mathematics, chemistry, and atmospheric science) but with a distinguished record in other disciplines may be accepted on a qualified basis with the understanding that deficiencies would be remedied early in the program.

Degree Requirements

Students seeking the Doctor of Philosophy degree through the Department of Atmospheric Sciences at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Department of Atmospheric Sciences. These degree requirements include:

1. Completion of 60 semester credits beyond the master's degree.
2. Two consecutive years of full time academic work completed in residence at the University of North Dakota campus. With approval of a student's Faculty Advisory Committee, one of these years may be completed through fulltime academic work and/or research at another institution or location.
3. At least 27 of the post-master's credits must be formal course work. A minimum of 18 of these credits must be taken in the Atmospheric Sciences department.
4. Up to 9 of the post master's credits may be taken through distance education.
5. Completion of AtSc 500 and 505 or equivalent classes.
6. A departmental seminar on dissertation research topic.

Students are required to complete coursework, a comprehensive examination, and independent research that culminate in a dissertation, seminar, and final examination.

Faculty and Areas of Expertise

- **Mark A. Askelson, Ph.D.:** Surface Transportation Weather, Mesoscale Weather Prediction, Model Initialization, Objective Analysis, Storm Dynamics, Cloud Modeling, Cloud Physics, Radar Meteorology
- **David J. Delene, Ph.D.:** Atmospheric Aerosol, Airborne Measurements
- **Xiquan Dong, Ph.D.:** Development and Application Of Ground- and Satellite-Based Remote Sensing Techniques, Cloud Physics and Radiation, and Parameterizations for Global/Climate Models
- **Matthew S. Gilmore, Ph.D.,** Kinematics, Microphysics, Electrification, and dynamics of severe convection with a focus on supercell thunderstorms
- **Cedric A. Grainger, Ph.D.:** Dynamic Meteorology, Cloud Physics, Weather Modification, Air Chemistry
- **John J. Mewes, Ph.D.:** Modeling of Earth/Atmosphere Interactions, Data Assimilation, Mesoscale Numerical Weather Prediction, Development of Surface Transportation And Agricultural Weather-Related Decision Support Systems
- **Gretchen Mullendore, Ph. D.:** Numerical Modeling, Convective Transport, Mesoscale Dynamics
- **Leon F. Osborne, Jr., M.S. (Graduate Director):** Numerical Weather Prediction, Forecasting, Synoptic Meteorology, and Surface Transportation Meteorology
- **Michael R. Poellot, Prof. and Chair:** Cloud Physics, Aviation Meteorology, Weather Modification, and Atmospheric Radiation
- **Jianglong Zhang, Ph.D.:** Satellite Remote Sensing, Atmospheric Aerosol

Facilities

The Department of Atmospheric Sciences is housed in Clifford Hall, part of the complex of buildings comprising the Odegard School of Aerospace Sciences on the west end of the University of North Dakota campus. The department supports diverse research and teaching facilities for cloud physics, air chemistry and radar meteorology instruction. Three primary research facilities include a 5-cm wavelength polarimetric Doppler weather radar and two instrumented ground sites, all of which are actively used by both faculty and students. One of the instrumented sites has been developed for studying surface hydrology, clouds and climate in the Northern Great Plains while the other is used to support surface transportation weather research. As part of this research-intensive program, you have the opportunity to utilize these facilities in your dissertation research. Research areas include atmospheric chemistry, surface transportation meteorology, mesoscale modeling, radar meteorology, climate analysis, cloud physics, radiation, ground- and satellite-based remote sensing, aviation meteorology, hydrometeorology, and weather modification. In addition, the department collaborates closely with the UND Regional Weather Information Center (RWIC). RWIC is a multi-discipline research, outreach and information center providing support to students, faculty and staff. The programs and data resources in RWIC allow you to broaden your knowledge base in your areas of interest.

Course Offerings

A complete listing of course offerings can be found online at:

<http://www.und.nodak.edu/dept/registrar/catalogs/graddept/depts/atsc.htm>

Application Deadlines

- For fall enrollment, applications are due by February 15 and applicants will be notified of their application status by March 15.
- For spring enrollment, applications are due by August 15 and applicants will be notified of their application status by September 15.

Contact Information

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