

# Atmospheric Sciences

**Wind, temperature, clouds, and precipitation in all forms are just a few of the elements that make up the weather. . .**

To master the science of weather, we need to gain an understanding of physical sciences and how they apply to the atmosphere. The curriculum at the University of North Dakota provides students with a strong background in the basic physical sciences including physics, chemistry and applied mathematics. These are prerequisites for rigorous study of atmospheric processes. Students also have the opportunity for hands-on experience in computer methods and access to both traditional and new technologies for atmospheric measurements, data processing, and analysis.

## What you can do with a degree in Atmospheric Sciences. . .

There are many different career paths that can be followed in atmospheric science including applied meteorology, nonuniversity research, university teaching and research, and media weathercasting. Weather forecasting is certainly the most recognizable applied meteorology endeavor. Career opportunities in forecasting exist in five major areas: public, military, private sector (industrial/commercial/broadcasting), aviation, and transportation. Other applied careers include consulting, marketing and sales, and atmospheric measurements and instrumentation. To learn more, check out "Discovering the Atmospheric Sciences" at [http://www.ucar.edu/student\\_recruiting/](http://www.ucar.edu/student_recruiting/)

## Program Options. . .

While the Atmospheric Sciences program has no defined tracks or specialty directions, students are allowed 12 credit hours of Atmospheric Sciences Electives, 11 credit hours of Free Electives, and 5 credit hours of Technical Electives to design their own area of specialty in Atmospheric Sciences. Many students take additional courses (and may minor) in Mathematics, Computer Science, Geography, Aviation, and Communications. Graduates are well prepared to either begin their careers upon graduation or continue on for additional educational opportunities.

## Getting in. . .

There are no specific requirements for admission to the program.

## Unique characteristics of UND's Atmospheric Sciences program. . .

- The Department of Atmospheric Sciences takes pride in promoting experiential (or "hands-on") learning opportunities for undergraduate students. The department has state of the art research facilities that include a dual-polarization Doppler radar, an instrumented jet research aircraft, an atmospheric and hydrologic ground research facility, and a surface transportation field research site. Students frequently work with faculty on current research projects.
- We have been very successful at promoting internship opportunities for students. The proximity of a National Weather Service Forecast Office and a commercial forecasting firm allows students to gain experience in operational meteorology.
- The Regional Weather Information Center (RWIC) provides students additional opportunities to participate in atmospheric research and applications in a real-world environment. These research projects deal with topics ranging from agriculture to transportation.
- The Department hosts several high performance computing clusters for research and academic use. One of the clusters is devoted exclusively to use with course activities.
- A state of the art weather graphics system allows students to gain experience through UND Television with the same broadcasting tools used in major television markets.

Information continued on opposite side. . .

## Atmospheric Sciences continued. . .

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### It's A Fact. . .

- The Department of Atmospheric Sciences has established a long-term atmospheric and hydrologic research facility. The facility is located on the Nature Conservancy Glacial Ridge Restoration Project site. The long-term goal of the facility is to deploy a highly instrumented monitoring network to better observe and understand atmospheric and hydrologic processes.
- The University of North Dakota owns a 5-cm wavelength (C-Band) weather radar. It was acquired by the Department of Aviation in 1974 for the purpose of weather modification research and training. In 1993, the radar moved to the top of Clifford Hall at the west end of the UND campus. In January 2004, the radar was upgraded to a dual-polarized system and has been operated in support of the research and academic programs of the Department of Atmospheric Sciences.
- The University of North Dakota owns and operates a Cessna Citation II jet aircraft for the purpose of atmospheric research. This aircraft is used for studies of clouds and climate change, air chemistry, aviation weather hazards, atmospheric turbulence, and other phenomena.
- The Regional Weather Information Center is an integral part of the John D. Odegard School of Aerospace Sciences. It houses high performance computing systems and weather data acquisition and processing systems to support atmospheric research.
- The Surface Transportation Weather Research Center operates and maintains a test facility field site. The test facility is a joint effort between the state, university and private sectors to determine the efficacy of existing and future Road Weather Information System (RWIS) data to provide support for research and operations. It provides in situ field test resources to conduct sensor validation from multiple technologies during weather extremes. In addition, the field research site provides the capability to explore methods to validate road weather forecast methods using RWIS-ESS.
- Staff members have expertise ranging from dynamic and synoptic meteorology to cloud dynamics and cloud physics. Atmospheric Sciences faculty conduct research on mesoscale and microscale meteorology, atmospheric chemistry, radar, cloud physics, severe storm modeling, and satellite meteorology.
- The Department of Atmospheric Sciences has four competitive scholarships for qualified students majoring in Atmospheric Sciences.

### It's A Fact (continued). . .

- The faculty of 12 is one of the largest staff of atmospheric scientists in the region.
- 73 undergraduates are currently enrolled in the program.
- The Atmospheric Sciences major was first offered in 1981.
- The ND Student Chapter of the American Meteorological Society is active on campus.
- The Atmospheric Sciences undergraduate program meets the recommended curriculum of the American Meteorological Society for a Bachelor of Science in Atmospheric Sciences.
- Most individuals in the atmospheric sciences are earning a respectable income.
- Students meet regularly with their faculty advisor.
- Class size for courses is moderate.
- Student to faculty ratio is low.

### For more information. . .

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