MASTER OF SCIENCE IN ATMOSPHERIC SCIENCE, PLAN B

The M.S. program in Atmospheric Science trains the next generation of scientists in atmospheric science, a critical field for understanding weather and climate issues that significantly impact all life on Earth. Graduates acquire the knowledge and skills necessary to enter diverse careers, including weather and climate forecasting, insurance, government laboratories, NGOs, and environmental consulting.

Students gain this knowledge through a core curriculum, a selection of elective graduate courses, and completion of a project with formal report under the guidance of an advisor.

Prerequisites

- Bachelor of Science (B.S.) degree in physics, mathematics, atmospheric science, engineering, chemistry, or related field with a cumulative GPA of at least 3.0.
- Calculus-based math course sequence including differential equations and vector analysis.
- Calculus-based physics course sequence including kinetics, electricity and magnetism, and some modern topics.

Plan B (Project)

An M.S. student is expected to demonstrate a breadth of knowledge in the fundamentals of atmospheric science. Under the Plan B option, the student must submit to their M.S. committee a scholarly paper that reflects such knowledge. The format and specific expectations for the paper are determined by the M.S. committee on a case-by-case basis.

The committee evaluates the scholarly paper based on its scientific content and clarity of presentation. Following evaluation, the committee will provide feedback to the student. If revisions are required, the student must make the necessary improvements and submit the revised paper to the M.S. committee by a deadline specified by the committee.

Students completing a Plan B M.S. degree may request admission to the Ph.D. program, although this pathway is less commonly pursued. If the student expresses interest in continuing to the Ph.D. program, the M.S. committee will provide a recommendation regarding their suitability for admission. This recommendation will be submitted to the Department Chair.

A minimum of 30 semester credits plus scholarly paper is required. At least 19 credits must be earned in structured academic courses. 11 credits may be in special studies, graduate seminars, and research. Of the total 30 credits, 20 must have the ATS subject code.

All M.S. students must complete the following required courses (required courses account for 13 credit hours):

- ATS 601 Atmospheric Dynamics I (2 credits)
- ATS 606 Introduction to Climate (2 credits)
- ATS 620 Thermodynamics and Cloud Physics (2 credits)
- ATS 621 Atmospheric Chemistry (2 credits)
- ATS 622 Atmospheric Radiation (2 credits)
- ATS 693 Responsible Research in Atmospheric Science (1 credit)
- One of the following:
  - ATS 640 Introduction to Synoptic Dynamics (2 credits)
  - ATS 641 Introduction to Mesoscale Dynamics (2 credits)

All M.S. students must also complete 6 elective credit hours in structured classes. Electives may include any structured class at the 500/600-level. With written advisor approval, electives may also include structured 700-level classes and/or structured graduate courses in other departments. Audited classes do not count towards the M.S. degree.

A student may substitute an alternate course for a required class if:

1. A course similar to the required class has already been completed at the graduate level with a grade of B or higher
2. The student's advisor, the department head, and the instructor of the required course approve the substitution in writing

A student's program of study, and any deviations therein from department degree requirements, requires department head approval.

ATS 784 does not count toward the 19 structured credits. ATS 699A-O and ATS 784 are graded as S/U.

In addition to meeting the formal credit requirements for the M.S. as described above, all graduate students enrolled in the department are expected to attend the weekly department colloquium series. These colloquia are an important part of the total instructional program. Details can be found on the colloquium page (http://www.atmos.colostate.edu/colloquia/) on the ATS website.

Learning Objectives

Successful students will demonstrate the following (as determined by their committee):

1. Apply knowledge of the fundamental concepts and tools of atmospheric science to address both real-world and theoretical problems in this field. Core areas of study include Climate and Atmospheric Dynamics, Weather and Weather Systems, Radiation and Remote Sensing, Data Assimilation and Atmospheric Chemistry.
2. Demonstrate an understanding and practice of research ethics and broader issues related to social responsibility.
3. Demonstrate proficiency in oral and written communication of research through presentations at professional conferences/meetings and preparation of a final written report.