

# 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.

## Requirements Effective Fall 2025

A minimum of 30 credits is required. At least 20 must be Department of Atmospheric Science courses (i.e., courses with the ATS prefix.) A scholarly paper, as defined by the graduate committee, must be prepared and presented to the committee<sup>1</sup>.

The student must complete a minimum of 30 semester credits. The 30 credit hours must include 1) the 13 required core credit hours listed under Plan A (including ATS 693) and 2) a minimum of 11 elective credit hours in structured classes. Electives may include any structured class at the 500/600 level. With written adviser approval, electives also may include structured 700 level classes and/or structured graduate courses in other departments. The remaining six credit hours may be in independent studies (ATS 695). Research credits (699, 799) and audits do not count toward the non-thesis M.S. degree.

Colloquium participation

All graduate students enrolled in the department are expected to attend the weekly department colloquium series. Colloquia are normally held once per week when classes are in session during the Fall and Spring Semesters.

Thesis requirements

No thesis is required for the Plan B MS.

Final projects (Plan B Master 's)

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 PhD program, although this pathway is less commonly pursued. If the student expresses interest in continuing to the PhD program, the M.S. committee will provide a recommendation regarding their suitability for admission. This recommendation will be submitted to the Department Head.

Competency exams

The scholarly paper described above comprise the student's final examination. Acceptance of the scholarly paper by the student's MS committee signifies a passing grade.

Internships or practicum experiences

No internships or practicum experiences are required.

Oral presentations

No oral presentation is required for the Plan B MS.

Teamwork expectations

Students are expected to work collaboratively on co-authored publications as appropriate for their research topic.

Code	Title	Credits
Required Coursework: <sup>2</sup>		
ATS 601	Atmospheric Dynamics I	2
ATS 606	Introduction to Climate	2
ATS 620	Thermodynamics and Cloud Physics	2
ATS 621	Atmospheric Chemistry	2
ATS 622	Atmospheric Radiation	2
ATS 640	Synoptic Meteorology	2
or ATS 641	Mesoscale Meteorology	
ATS 693	Responsible Research in Atmospheric Science	1
ATS 695A	Independent Study: Atmosphere/Ocean Coupling	6
or ATS 695B	Independent Study: Atmospheric Science Topics	

Elective credits of ATS 5XX-6XX <sup>3,4</sup>	11
Program Total Credits:	30

A minimum of 30 credits are required to complete this program.

- <sup>1</sup> This professional paper is required for graduation from this program.
- <sup>2</sup> A student may substitute a required class for an alternative course if:

i. A course similar to the required class has already been completed at the graduate level with a grade of B or higher

ii. The student's advisor, the department head, and the instructor of the required course approve the substitution in writing
- <sup>3</sup> Electives must be regular courses; all courses ending in the range -82 through -99 do not meet the electives requirement. Electives may include any structured class at the 500/600 level. With *written* instructor and advisor approval, electives may also include structured 700 level classes and/or structured graduate courses in other departments.
- <sup>4</sup> 6 of the 11 elective credits can be in ATS 695 (Independent Studies).

Requirements for All Graduate Degrees

For more information, please visit Requirements for All Graduate Degrees (<http://catalog.colostate.edu/general-catalog/graduate-bulletin/graduate-study/procedures-requirements-all-degrees/>) in the Graduate and Professional Bulletin (<http://catalog.colostate.edu/general-catalog/graduate-bulletin/>).

Summary of Procedures for the Master's and Doctoral Degrees

NOTE: Each semester the Graduate School publishes a schedule of deadlines. Deadlines are available on the Graduate School website (<https://graduateschool.colostate.edu/deadline-dates/>). Students should consult this schedule whenever they approach important steps in their careers.

Forms (<https://graduateschool.colostate.edu/forms/>) are available online.

Step	Due Date
1. Application for admission (online)	Six months before first registration
2. Diagnostic examination when required	Before first registration
3. Appointment of advisor	Before first registration
4. Selection of graduate committee	Before the time of fourth regular semester registration
5. Filing of program of study (GS Form 6)	Before the time of fourth regular semester registration
6. Preliminary examination (Ph.D. and PD)	Two terms prior to final examination
7. Report of preliminary examination (GS Form 16) - (Ph.D. and PD)	Within two working days after results are known
8. Changes in committee (GS Form 9A)	When change is made
9. Application for Graduation (GS Form 25)	Refer to published deadlines from the Graduate School Website

9a. Reapplication for Graduation (online)	Failure to graduate requires Reapplication for Graduation (online) for the next time term for which you are applying
10. Submit thesis or dissertation to committee	At least two weeks prior to the examination or at the discretion of the graduate committee
11. Final examination	Refer to published deadlines from the Graduate School Website
12. Report of final examination (GS Form 24)	Within two working days after results are known; refer to published deadlines from the Graduate School website
13. Submit a signed Thesis/ Dissertation Submission Form (GS Form 30) to the Graduate School and Submit the Survey of Earned Doctorates (Ph.D. only) prior to submitting the electronic thesis/ dissertation	Refer to published deadlines from the Graduate School website.
14. Submit the thesis/dissertation electronically	Refer to published deadlines from the Graduate School website
15. Graduation	Ceremony information is available from the Graduate School website