MASTER OF SCIENCE IN ATMOSPHERIC SCIENCE, PLAN A

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 pursue a Ph.D. or to enter diverse careers, including weather and climate forecasting, insurance, government laboratories, NGOs, and environmental consulting.

Students gain this expertise through a core curriculum, a selection of elective graduate courses, and hands-on scientific research with their advisors.

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 A (Thesis)

Students that complete a thesis-based M.S. program acquire the knowledge and proficiency needed in the field of atmospheric science, allowing them to either continue their education at the Ph.D. level, or seek employment in a wide range of careers (such as weather and climate forecasting and prediction, insurance, government labs, NGOs, environmental consulting).

A minimum of 30 semester credits plus thesis 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. Broad knowledge of the fundamental areas of atmospheric science that include Climate and Atmospheric Dynamics, Weather and Weather Systems, Radiation and Remote Sensing, and Atmospheric Chemistry.
2. Understanding and practice of research ethics and broader issues related to social responsibility.
3. Proficiency in oral and written communication of research through presentations at professional conferences/meetings and preparation of manuscripts for professional journals.

Requirements Effective Fall 2025

A minimum of 30 semester credits and a high-quality original research project are required. At least 19 credits must be earned in the structured academic courses. 11 credits may be in special studies, graduate seminars, and research (a maximum of 11 research credits is allowed). Of the total 30 credits, 20 must be Department of Atmospheric Science courses (i.e., courses with the ATS prefix).

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

MS Plan A students are required to complete a Master's thesis based on their research. The work is expected to be of publication quality.

Oral presentations

Students are required to give a public oral presentation based on their MS thesis. The presentation and following question period are expected to last about one hour.

Competency exams

Following the public oral defense of the Master's thesis, the student will meet privately with their M.S. committee. This session typically lasts less

than one hour and is intended for the committee to ask questions related primarily to the thesis work.

Once the question-and-answer session concludes, the student will be asked to leave the room. The committee will then discuss the quality of the thesis, the oral presentation, and the student's answers to the oral questions in the private meeting.

To pass the defense, the student must demonstrate high scientific quality in the thesis work, the clarity in the oral presentation, and thoughtful responses to the committee's questions. If concerns arise regarding the student's performance, the committee may require the student to complete additional work. The nature and the scope of this work will be determined on a case-by-case basis. A submission deadline will be specified, and a follow-up meeting may be requested at the committee's discretion.

The committee will determine the outcome of the defense (pass, partial pass, or fail). Additionally, as part of the evaluation process, the committee will provide a recommendation regarding the suitability of the student for admission to the PhD program, should the student wish to pursue it. This recommendation will be submitted to the Department Head.

Internships or practicum experiences

No internships or practicum experiences are required.

Teamwork expectations

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

Code	Title	Credits
Required Coursework: [1]		
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
Elective credits of ATS 5XX-6XX [2]		**6**
Research/Thesis (ATS 699) Credits [3,4]		**11**
Program Total Credits:		**30**

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

1. 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.
2. 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.
3. Students will select their advisor's section of ATS 699.
4. Students are expected to enroll in 15 credits each semester and will therefore earn more than 11 thesis credits.

Requirements for All Graduate Degrees

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