



**Atmospheric Sciences
Masters of Science (M.S.) DEGREE
Departmental REQUIREMENTS**

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NOTE: This document is meant to guide the student through the complicated path of obtaining a graduate degree. It is not to be regarded as a legally binding contract. If you have any questions please ask.

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General Requirements

COURSES

Students seeking a Master's (M.S.) degree in Atmospheric Sciences must complete a minimum of 33 units of graduate course study.

24 units of graduate course work in Atmospheric Sciences

3 elective units of graduate-level course work

3 units minimum of research (ATMO 900/910)

2 units HAS seminar

1 unit additional course (e.g., could be 1 additional unit of research)

33 total credits

A. The following **core courses**, or their equivalents at other institutions, are **mandatory** for all students:

ATMO 541A Dynamic Meteorology I 3 units

ATMO 541B Dynamic Meteorology II 3 units

ATMO 551A Physical Meteorology I 3 units

ATMO 551B Physical Meteorology II 3 units

AND at least 12 additional units of course work in Atmospheric Sciences at the 500/600 course level.

B. An additional 3 elective units of graduate-level coursework are required and can be taken in ATMO or any other department at the University of Arizona.

C. Students are required to take a minimum 3 units of research credit (ATMO 900/910). Furthermore, while students may take more than 3 credits of 900/910 a maximum of 4 units are allowed towards your degree.

D. Students are also required to take a minimum of 2 units of seminar. These credits are graded S, P, and K, and do not count toward the student's overall GPA.

A Typical Master's Program:

Semester	Course	Units
Fall: Year 1	ATMO 541A	3
	ATMO 551A	3
	ATMO XXX (elective)	3
Spring: Year 1	ATMO 541B	3
	ATMO 551B	3
	ATMO XXX (elective)	3
Fall: Year 2 <i>*Qualifying Exam</i>	ATMO XXX (elective)	3
	XXXX XXX (elective)	3
	ATMO 900/910 (Research/Thesis)	2
	Seminar	1
Spring: Year 2	ATMO XXX (elective)	3
	ATMO 900/910 (Research/Thesis)	2
	Seminar	1
Total Units		33

**The Qualifying Exam is required for students to pass if they plan on continuing into the ATMO doctoral program.*

MAJOR ADVISOR

During the first semester, the student should select a Major Advisor to chair their committee. The student and Major Advisor then select the Master's Committee members for the student. A Master's committee must consist of a minimum of three members: the Chair (Major Advisor) and two UA Faculty members. At least two members must be tenure-track faculty. If the third member is not a tenure-track UA faculty member, he or she must be approved by the Graduate College as a special member. A member who is not tenure-track will not be eligible to serve as sole chair of the committee but can serve as co-chair if approved to do so by the Graduate College.

PLAN OF STUDY

By the end of the second semester, the student and their Major Advisor should have decided on the student's Plan of Study (POS). Please see the Graduate Coordinator for forms and procedures. The POS must have the approval of the student's Major Advisor and the Director of Graduate Studies before it is submitted to the Graduate College. Once the Graduate College approves the POS, a \$35 fee will be billed to your Bursar's Account. The POS GradPath form can be accessed

through your UAccess Student account. Credits from other institutions the student wishes to transfer should be discussed and may be approved by the Graduate Director and Major Advisor at this time. Any changes to the original POS must be re-submitted to Graduate College during the final semester.

The POS identifies:

- courses the student intends to transfer from other institutions;
- courses already completed at The University of Arizona which the student intends to apply toward the graduate degree; and
- additional course work to be completed to fulfill degree requirements. If planning to transfer course credit then the student must complete the **Application to Transfer Coursework** form through GradPath Forms, which is accessed through your UAccess Student.
- A maximum of six (6) semester hours of transferred credit may be used to meet degree requirements.

ARIZONA RESIDENCY

Students must meet the following **minimum** residence/enrollment requirements:

- A. A minimum of 12 units must be completed in residence at The University of Arizona. The remaining credits required for the master's degree must be met by University credit, graduate-level courses, including on-campus courses, courses offered away from the main campus, and approved thesis credit *in absentia*.
 - a. **Without Assistantships:** Students must enroll with a minimum of nine (9) units of graduate credit each regular semester to maintain a full-time student status.
 - b. **With Assistantships:** Students must enroll with a minimum of six (6) units of graduate credit each regular semester.

QUALIFYING EXAMINATION

The students must have met all core course requirements with an average 2As and 2Bs in order to take the qualifying exam. Failure to either take the exam or to pass the exam after two attempts means that students may not advance into the doctoral program but continue the completion of the M.S. degree.

CONTINUING STUDENT STATUS

After finishing all course requirements, students must continue to register each Fall and Spring for a minimum of 1 graduate unit until all degree requirements are met. If the degree program requirements are to be completed in the summer, the student must register for a minimum of 1 unit of graduate credit during that term. If all course work is completed, the student may enroll in ATMO 900 or ATMO 910.

NOTE: If the student enrolls in **only** 900-level courses during his/her final semester, s/he may be entitled to a "900-Level Graduate Tuition Waiver" if living out of state and not using University resources. Tuition waivers are only available during the Fall and Spring semesters. Please see the Graduate Coordinator for more information.

RESEARCH

At the discretion of each student's Master's Committee, either a thesis or a publishable scholarly paper on an original *research topic*, judged to be suitable by the student's Master's Committee, and must be submitted:

- A. A student planning to submit a thesis is required to enroll in ATMO 910 in their final semester with a minimum 3units.
- B. A student planning to submit a scholarly paper is required to enroll in ATMO 900 in their final semester with a minimum 3units.
- C. A maximum of four (4) units of 900/910 are counted towards the M.S. degree.

REQUIRED DEMONSTRATION OF COMPETENCE

- A. All students must demonstrate, to the satisfaction of each student's Major Advisor, proficiency in both statistics and computer programming (e.g. FORTRAN, MatLab, GrADS, and NCL), numerical atmospheric models and specialized instrumentation Participation in laboratory or field work may be a component. This may be demonstrated by the successful completion of approved courses in these subjects, either as an undergraduate or graduate student.

AND

- B. All students, will be required to present the results of their research in a formal seminar or presentation at a scientific meeting in the form of an oral or poster presentation. Typically a student presents at the annual El Dia del Agua y Atmosfera (April), AGU (December) or AMS (January) meetings.

GRADUATING

When the student's Major Advisor and committee members approve the student's thesis or scholarly paper and all degree requirements have been met, then the Major Advisor will contact the Graduate Coordinator to process a **Master's Completion Confirmation**.

CONTINUING INTO THE DOCTORAL PROGRAM

Applying to the doctoral program: A student must have received a minimum average grade 2 As and 2 Bs in the four ATMO core courses at the master's level and passed the Qualifying Exam in order to advance into the doctoral program. A student with less than these requirements must have their advisor petition the faculty for a waiver before they can continue. Qualified students who have completed the master's degree in this Department and who wish to continue in the doctoral program must apply to the doctoral program during their 4th or final semester in the Spring to meet the admission deadline of January 15th (International Students) and February 1st (Domestic Students). See your Major Advisor and the Graduate Coordinator for assistance.

The Research Topic

The choice of a research topic is one of the most important decisions confronting the student. The guidance and advice of the student's Major Advisor should help in making the decision. Although there are no specific rules, the following principles may be helpful:

- A. The problem should require the use of material covered in at least some part of the graduate course program.
- B. Although master's-level research is carried out under the close supervision of a faculty member. Some element of originality on the student's part should be involved. In other words, the problem itself may be new, or a new approach or new method of analysis may be applied to an old problem.
- C. The problem should be carefully limited in scope. A thorough piece of work on a small problem is generally satisfactory, while a sketchy development of a large problem is not generally acceptable.
- D. The research problem cannot be secret or classified in the military sense.
- E. Except in certain special cases, collaboration of two or more students on one thesis is not allowed.
- F. Written as a thesis following the university's format (See p. 11) or as a publishable scholarly paper (see p. 12) following the intended publication's format.

The Thesis

1. The Graduate College has prepared a detailed **Manual for Theses and Dissertations** for use by graduate students at <http://grad.arizona.edu/academics/degree-certification/diss-theses/manuals>. To be accepted, all theses must comply with these instructions.
2. In general, a thesis should be written in as concise a manner as possible, never exceeding a few tens of pages in length. A lengthy, "padded" manuscript will not be accepted. Note, also, that responsibility for adequate writing standards rests with the student.
3. Each student should be aware that all members of their Master's Committee must read the thesis and approve it prior to its being accepted by the Department. Therefore, the student **must** allow ample time for their master's committee to accomplish this prior to the student's proposed graduation date which may otherwise be delayed if the student fails to do so. The Department requires a minimum of two weeks before the end of the semester.
4. A copy of the final approved thesis must be provided to the Department.
5. Neither the Department nor the Graduate College requires that the thesis be submitted to the Graduate College. Should the student choose to submit their thesis to the Graduate College, two (2) copies of the completed thesis, conforming to the requirements of the Graduate College and approved by the Department, and an abstract of 150 words or less must be deposited with the Dean of the Graduate College at least 15 days before the date on which degrees are awarded.
6. A thesis fee is paid to the University Cashier to cover the cost of microfilming which becomes the archival copy in the UA Library.

The Scholarly Paper for Publication

1. An alternate procedure for satisfying the master's research requirements, one preferred by most students, is to write a paper that is judged by the student's Master's Committee to be acceptable for publication in a scientific journal.
2. Such a paper is generally much shorter in length than the usual master's thesis and must be written in accordance with the format of the U.S. journal to which it will be submitted. The student's Master's Committee will not normally judge a paper to have satisfied the master's requirement until this procedure has been followed.
3. Graduate students are expected to write clear and logical accounts of their work in the English language. The Master's Committee may reject a manuscript that is poorly written. The best way a student can learn to write an acceptable paper is through practice, coupled with a careful review of papers on a similar topic that have appeared in the literature. Detailed derivations and explanations are necessary only when they are original and do not appear elsewhere. Another option to improve writing is by attending the Graduate Writing Institute offered in June for three weeks, see their website for further information at <http://grad.arizona.edu/gwi> or attend Graduate/International Writing Workshops offered each semester by the Writing Skills Improvement Program, <http://wsip.arizona.edu/workshop-series>.
4. Figures should be limited and carefully selected for information content. Generally, there should not be more than one figure per typewritten page.
5. Although the requirement states that the paper has only to be suitable for publication and not actually submitted for publication, the latter is implied. It is certainly to the student's advantage to have a paper published, especially if s/he plans to make a career of research.

Special Notes

1. Please become familiar with the Departmental forms and procedures located on the ATMO website, as well as the Graduate College forms located in GradPath forms accessed through your UAccess Student.
2. Full graduate credit will be given to graduate courses taken no more than six (6) years before the completion of degree requirements. Coursework more than 6 years old will not be accepted toward meeting the degree requirements.
3. Validation of work by examination is not permitted. No courses taken by correspondence can be used for graduate credit.
4. The cumulative grade point average required for granting the master's degree is 3.000, based on A = 4.000, B = 3.000, C = 2.000, D = 1.000, and E = 0.000.
5. The grades of D and E do not carry graduate credit, but are included in the grade-point average.
6. The grades of S (Superior) and P (Passing) given for ATMO 900/910 and ATMO596A are not included in the overall grade point average, but are included for graduate credit. In special circumstances, grades of C, D or E may be given for ATMO 910; such grades will be used in computing the overall grade point average.
7. Students who change their plans regarding submission of a thesis versus a manuscript must proceed as follows:
 - a. To change from manuscript to thesis, students should enroll in 3 credits of ATMO 910 in their final semester. Nothing else needs to be done.
 - b. To change from thesis to manuscript, students should enroll in ATMO 900 in their final semester for a minimum 3 credits. ATMO 910 credits must be deleted from the Plan of Study when the Completion of Master's Degree Requirements form is submitted.