Department of Atmospheric Sciences
Institute of Atmospheric Physics

Ph.D. DEGREE

REQUIREMENTS

(Updated June 2012)
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Note: This document is meant to guide the student through the complicated path of obtaining a graduate degree. It is subject to change and is not to be regarded as a legally binding contract. If you have any questions please ask.
General Requirements

All Ph.D. students are personally responsible for taking the following steps at the proper times. All forms must be submitted before the deadline dates as scheduled by the Graduate College. See the ATMO Graduate Secretary for information on these deadlines and all forms required by the Graduate College Degree Certification office. For assistance with any problems, students are encouraged to meet with their Major Advisors, the Graduate Director, the Graduate Secretary, the Department Head, and/or the Graduate Student Representatives.

1. All students seeking a Ph.D. must complete a minimum of 66 units of graduate credit.

   - 36 units of graduate course work in their major field of study
   - 12 units of graduate course work in their minor field of study (typical)
   - 18 units of dissertation credit (ATMO 920)
   - 66 total credits

a. Students are required to take 36 units of graduate course work in Atmospheric Sciences. The following core courses, or their equivalents at other institutions, are required of all students:
   - ATMO 541A  Dynamic Meteorology  I  3
   - ATMO 541B  Dynamic Meteorology  II  3
   - ATMO 551A  Physical Meteorology  I  3
   - ATMO 551B  Physical Meteorology  II  3

   AND at least 18 additional units of course work in Atmospheric Sciences at the 500 or 600 level.

   - 18
   - 30

   The remaining 6 units are electives and can be taken in departments outside of ATMO.

b. Students are required to complete a Minor Program, which typically includes 12 credits of coursework. However, the requirements are determined by the minor department and may include a written minor examination.

c. Students are required to take a minimum 18 units of ATMO 920 for dissertation credit. These units cannot be taken until after the Comprehensive Examination has been passed and are in addition to the 36 units of graduate course credit described in (a).

d. Students are also required to take a minimum of 2 credits of seminar (ATMO 596a). These credits DO NOT count toward the 66 total credits required for the dissertation.
2. During the first semester, the student should select their Major Advisor. The student and Major Advisor then decide on the student’s Ph.D. Committee members (refer to the Graduate College minimum requirements for the comprehensive exam committee membership).

3. By the second semester, the student and their Major and Minor Advisors should have decided on the student's program of study and the Doctoral Plan of Study (DPOS) should be filed with the Graduate College. Credits from other institutions the student wishes to transfer should be discussed and must be approved by the Graduate Advisor and the Major Advisor at this time.
   a. If the student obtained their M.S. in ATMO then any of the required 33 units of course work for the M.S. degree that were taken at the University of Arizona for which a regular grade of A or B was obtained may be applied to the 36 units of course work required for the Ph.D.
   b. No more than 12 credits listed on the DPOS may be taken while in non-degree-seeking status. None of the total units listed on the DPOS can be in courses graded S or P rather than a regular letter grade.
   c. The transfer of credit form must be filed before the end of the first year of study.
   d. A full program of study, including approved transferred credits, will not be provided to the Graduate College Degree Certification until the student files the DPOS form.

4. Students who have not yet passed the written Qualifying Examination must notify the ATMO Graduate Secretary no later than September 15 in their first semester to schedule the examination for November/December of the first year.
   a. Students who enter the Ph.D. program with an M.S. degree in a discipline other than Atmospheric Sciences must take the qualifying exam in November/December of their second year after first passing the ATMO core courses with a minimum 2 As and 2 Bs.
   b. Students who enter the Ph.D. program without having an M.S. degree are first required to take the necessary steps to acquire an M.S. degree. Please refer to the Department's M.S. Degree Requirements handbook.

5. Students must meet the following minimum resident/enrollment requirements:
   a. To meet the minimum Graduate College residence requirements, at least 30 units of graduate credit, in the student's major and/or minor field of study, must be completed at The University of Arizona.
   b. Without Assistantships: Students must spend at least two (2) regular semesters in residence with a minimum of nine (9) units of graduate credit each semester.
c. **With Assistantships:** Students must complete four (4) semesters of residency during which they enroll for a minimum of six (6) credits per semester.

6. After completion of all, or almost all, non-dissertation credits required at The University of Arizona including minor requirements, the student must take and pass the **Comprehensive Examination.** (Refer to the following section entitled “The Comprehensive Examination”).

   a. The student must provide the ATMO Graduate Secretary with at least four (4) weeks notice of his/her intent to take the written Comprehensive Examination (and, subsequently, the oral Comprehensive Examination).

7. Students must continue to register each Fall and Spring semester for a minimum of 3 graduate units until all degree requirements are met. If all coursework and dissertation credit requirements have been met then students must continue to register for a minimum 1 credit.

   a. Doctoral students who have maintained continuous enrollment, fulfilled all their other degree requirements as well as the 18 hours of dissertation and were enrolled in the prior semester may defend in the summer or winter term without registration.

**N.B.** 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. Please see the ATMO Graduate Secretary for more information.

8. All students must demonstrate, to the satisfaction of each student’s Major Advisor, proficiency in both statistics and computer programming. This may be done by the successful completion of approved courses in these subjects, either at the undergraduate or graduate level.

9. Students must complete and defend a **Dissertation** based on original research (Refer to the following section entitled “The Oral Defense Examination”).
The Qualifying Examination

1. The Qualifying Examination is required of any student who wishes to continue in the Ph.D. program. The examination tests the student’s breadth of knowledge in the general field of study. It is administered in November of every year as required.

2. All Ph.D. students who did not take the Qualifying Examination during their Masters must take the exam in the Fall semester of the first year (i.e., 1st semester), with a second chance the following January (within 8-10 weeks). Students will be notified of the date of an upcoming examination. A Ph.D student entering the program with a M.S. in a discipline other than Atmospheric Sciences will be required to take the Qualifying Examination in November of their 2nd year (i.e., 3rd semester) after all ATMO core courses have been passed with a minimum of 2 As and 2 Bs.

3. Students who are required to take the Qualifying Examination must notify the ATMO Graduate Secretary no later than September 15 of their intent to take the Qualifying examination (for the examination the following November).

4. The Qualifying Examination will test breadth of knowledge in the subject area. Representative core-course syllabi, reading lists, and old exams are available from the Graduate Secretary for checkout. The exam will comprise 3 hours of questions, each 10-20 minutes long, and normally 4 hours are allowed to finish the exam. Each question will be graded PASS or FAIL. Passing more than half of the questions offered is a necessary (but not sufficient) requirement to be awarded a PASS on the Qualifying Examination. The final grade is determined by the faculty.

5. The student must have passed the Qualifying Examination in order to continue in the Ph.D. program. Two attempts are allowed with the second attempt occurring the January after the first attempt (i.e., within 8-10 weeks). If neither attempt is successful, the student will not be allowed to continue in the Ph.D. program and will finish up their studies by the end of the semester.
Comprehensive Examination

1. The Comprehensive Examination is intended to test the student’s comprehensive, in-depth knowledge of the major subject of study and area of specialization. It is composed of:
   - A written examination; and
   - An oral examination

2. Students must complete all, or almost all, of their non-dissertation credits required at The University of Arizona including the minor requirements before taking the Comprehensive Examination.

3. The student is expected to take the Comprehensive Examination no later than the semester following completion of non-dissertation course requirements for the Ph.D. degree. Except under unusual circumstances, the student typically takes the Comprehensive Examination no later than the 6th semester. If the student received an M.S. degree from this department, the Comprehensive Exam should be taken no later than the 4th semester.

4. The written and oral portions of the Comprehensive Examination should normally take place within 6 weeks of each other, but no more than two successive semesters apart, not including summer sessions.

5. The written Comprehensive Examination is offered upon pre-arrangement between the student and his/her Major Advisor and Ph.D. Committee. To schedule the written Comprehensive Examination, the student must consult with his/her Major Advisor to set an initial date for the written portion of the exam. Once arranged, the student must then notify the ATMO Graduate Secretary in writing (e-mail is accepted) at least 6 weeks in advance to schedule a room.

6. The written Comprehensive Examination is composed as follows:

   **Research Prospectus:** Submission of the Research Prospectus or Dissertation Proposal is mandatory to initiate the Comprehensive Examination process. The prospectus is reviewed by the Major committee who will acknowledge receipt and provide written comments.

   **Written Examination:** The written examination will test depth of knowledge on specialized material associated with the students acknowledged area of expertise. The examination will be assembled by the Major Advisor and student’s Ph.D. Committee. Students should consult with members of their Ph.D. Committee for guidance on exam material. Students will be required to attempt eight 15-minute questions although more may be provided. Normally, 3 hours will be
allowed to complete this part. Each question is graded PASS or FAIL. Passing at least 6 questions attempted is a necessary (but not sufficient) requirement to be awarded a PASS on the written exam. The final grade is determined by the Major Advisor and Ph.D. Committee.

7. In order to pass the written Comprehensive examination, a student **must** submit the Research Prospectus, and **must** PASS the written exam. If the student FAILS the written Comprehensive Examination in his/her initial attempt, he/she will be granted one chance to re-take that portion within 4 weeks. The student will be terminated from the program if the second attempt is also a FAIL or if the student fails to re-take that portion within 4 weeks of the first offering.

8. Upon successful completion of the written Comprehensive Examination, the Oral Comprehensive Examination is conducted before the student’s Ph.D. committee comprising both Major and Minor members. To schedule the Oral Comprehensive Examination, the student must consult with his/her Ph.D. Committee to set a date for the oral portion of the exam. It is the student’s responsibility to ensure that the date of the oral exam suits the schedules of his/her Committee. All members of the Ph.D. committee must be present at the exam. Once arranged, the student must then notify the ATMO Graduate Secretary **in writing** (e-mail is accepted) **at least 4 weeks in advance** to schedule a room.

9. The student is responsible for downloading and filling in the **Results of Oral Comprehensive Exam** form at [http://grad.arizona.edu/forms](http://grad.arizona.edu/forms) and obtaining the required signatures.

10. The Oral Comprehensive Examination will be a minimum two hours long and will cover general fundamental knowledge of both atmospheric sciences and the minor field. No student will be permitted a second attempt to pass the oral examination except upon the recommendation of his/her Graduate Committee, endorsed by the Department and approved by the Graduate College.
The Dissertation Defense Examination

1. Upon completion of his/her dissertation, the student will take an oral examination in defense of the dissertation. The student must submit copies of the draft dissertation to his/her Graduate Committee no less than one (1) month before taking the Oral Defense Examination.

2. The student must make all necessary arrangements to schedule the Dissertation Defense with his/her examining committee. Note that members of the examining committee representing the minor department may waive their right to be present at the Dissertation Defense. It is the student's responsibility to contact the examining committee members from the minor department to ascertain whether they wish to be present at the Dissertation Defense. They do not need to sign the announcement of final examination form if they will not be present.

3. At least seven (7) working days before the proposed examination date, the student must submit the exact time and place of, and announcement of final examination form to the Graduate College Degree Certification office and arrange for a public announcement in Lo Que Pasa.

4. There is no minimum time for the examination, but the entire proceedings, including public seminar, may not exceed three (3) hours.
The Dissertation

1. A dissertation, to be acceptable, must contribute something useful to the general fund of knowledge in atmospheric sciences. It should be considerably broader in scope than an M.S. thesis and should present an exhaustive analysis of the problem under consideration. A useful guide is that a dissertation should comprise material for a minimum three publishable papers.

2. The Department will accept dissertations which include published/publishable papers in the format described in Appendix A of *A Manual for Theses and Dissertations*, but acceptance is contingent upon written agreement to this format from the student’s Major Advisor.

3. Upon successful completion of the Final Dissertation Defense Examination, the student must submit the dissertation electronically for forwarding to the library of the University of Arizona and to University Microfilms, Inc. The Department requires a third copy of the approved dissertation and abstract for its library.

4. The dissertation must comply with all formatting requirements. The Format Check Process is available on the Graduate College website [http://grad.arizona.edu/academics/degree-certification/diss-theses/format-check-process](http://grad.arizona.edu/academics/degree-certification/diss-theses/format-check-process).

5. The student must submit draft copies of the dissertation to their Graduate Committee at least one (1) month before the Dissertation Defense.

6. Both copies of the dissertation submitted to the Graduate College Degree Certification will be delivered to the UA Library by GDC. Dissertations are published by University Microfilms in Ann Arbor, Michigan, and a fee is charged to cover this expense. Upon certification by the student’s Major Advisor, members of his/her examining committee and the Dean of the Graduate College, one copy of the dissertation will be forwarded to University Microfilms, along with the Agreement form. The second copy of the dissertation remains in storage at the UA Library.

7. Publication by microfilm does not preclude publication by other methods later, and successful candidates are urged to submit dissertation material for publication in a scholarly or professional journal. Suitable acknowledgement must always indicate the publication to be a dissertation, or portion of a dissertation, submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at The University of Arizona.
Minor Degree Program in Atmospheric Sciences

1. Students from other departments who wish to Minor in Atmospheric Sciences must complete 12 credits of atmospheric sciences at the 500 level or higher of which three units must be from ATMO 536a. The other 9 graduate units are to be chosen from any of the ATMO electives whose home department is ATMO. Any pre-requisites for electives must be satisfied before the electives are taken. The written examination may be waived by the student’s Minor Committee if an average GPA of 3.5 is achieved for all 4 courses. Otherwise students may be required to take a written minor exam.

2. Students minoring in ATMO must arrange with the Director of Graduate Studies to select a Minor representative for their Ph.D. Committee. The Minor Representative is required to sign off on the minor “plan of study” to ensure an appropriate program is selected.

3. A student entering the Ph.D. program in Atmospheric Sciences with an M.S. degree in another field is permitted to minor within the Department, subject to the approval of the student's Graduate Committee or the Director of Graduate Studies. These courses are in addition to those required for the Ph.D. program. Subject to the approval of the student's Graduate Committee, the student can take up to six (6) credits of minor courses in other departments that relate to his/her area of research.
**Special Notes**

1. Validation of work by examination is not permitted. No courses taken by correspondence can be used for graduate credit.

2. The cumulative grade point average required for granting the Ph.D. degree is 3.000, based on A = 4.000, B = 3.000, C = 2.000, D = 1.000, and E = 0.000.

3. The grades of D and E do not carry graduate credit, but are included in the grade-point average.

4. The grades of S (Superior) and P (Passing) given for ATMO 920 are not included in the overall grade point average, but are included for graduate credit.