



Handbook for Current Graduate Students

Department of Atmospheric and Oceanic Sciences (ATOC)
University of Colorado Boulder

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Please note: This handbook was initially generated by copying all of the content directly from the Academics / Current Graduate Students section of the ATOC web site as it existed on November 5, 2014. Only minor modifications were made to the ordering and wording of the headings and subheadings to improve organization. Aside from any repetition or typos that existed at the time, the information remains accurate.

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I. Academic standards, coursework requirements, and exams

Academic Standards

A student is required to maintain at least a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the M.S., a course mark below C is unsatisfactory and will not be counted toward fulfilling requirements for the degree. For the Ph.D., a course grade of C+ or below is unsatisfactory and will not be counted toward fulfilling requirements for the degree. A brief overview of the main requirements is given here. For more information regarding coursework and exam requirements, please see details for each specific degree program.

Doctoral Degree (PhD)

A total of 36 credit hours of regular coursework is required, of which 30 hours must be numbered 5000 or above, with at least 18 credit hours of ATOC graduate lecture courses including core ATOC course requirements, and a graduate-level course in applied or computational mathematics. In addition, 30 credit hours of dissertation must be completed per Graduate School rules and requirements. Students must pass a two-part comprehensive examination before admission into candidacy. Part I of the comprehensive examination is a written exam based on core course material and is normally taken in the second year. Part II of the comprehensive examination is normally taken in the third year and is an oral examination based on an original research paper prepared by the student.

Scheduling the Final Examination (defense) is the responsibility of the student. The student should schedule a meeting with his or her entire committee approximately one year prior to when the student thinks he or she will be ready to defend to determine if completion of the dissertation along this timeline is feasible. Scheduling of the actual defense date is normally done only after the research advisor and other committee members have read at least a draft copy of the written dissertation and have given approval to proceed with the Exam. Once the defense date has been set, the ATOC guideline for submitting a polished copy of the written dissertation to each committee member is one month prior to the date of the defense.

Master of Science with Thesis and Master of Science Non-Thesis (MS)

For both thesis and non-thesis options, a total of 30 credit hours is required with at least 15 credit hours of ATOC courses numbered 5000 and above. Other specific course requirements are in the ATOC Graduate Handbook. For the thesis option, the final examination consists of an oral exam on the thesis. The non-thesis option requires the successful completion of a written final examination based on ATOC regular coursework requirements.

Core ATOC Graduate Courses

The following list of core courses are referred to throughout this handbook.

Atmosphere Track (A-Track)

1. ATOC 5050: Introduction to Atmospheric Dynamics
2. ATOC 5051: Introduction to Physical Oceanography
3. ATOC 5060: Dynamics of the Atmosphere and Ocean

4. ATOC 5235: Introduction to Atmospheric Radiative Transfer and Remote Sensing
5. ATOC 5151: Atmospheric Chemistry
6. ATOC 5600: Physics and Chemistry of Clouds and Aerosols

Oceanography Track (O-Track)

1. ATOC 5050: Introduction to Atmospheric Dynamics
2. ATOC 5051: Introduction to Physical Oceanography
3. ATOC 5060: Dynamics of the Atmosphere and Ocean
4. ATOC 5235: Introduction to Atmospheric Radiative Transfer and Remote Sensing
5. ATOC 5200: Biogeochemical Oceanography
6. Plus one of the following courses
 - a. ATOC 7500: Physical Oceanography and Climate
 - b. ATOC/ASEN 5215: Descriptive Physical Oceanography
 - c. ATOC/ASTR 5400: Introduction to Fluid Dynamics
 - d. GEOL 5270: Marine Chemistry and Geochemistry
 - e. GEOL 5430: Paleoceanography and Paleoclimatology
 - f. MCEN 5021: Introduction to Fluid Dynamics

a. Master's degree, non-thesis

i. Academic standards and coursework requirements

Master's Degree Non-Thesis Option

Academic Standards

A student is required to maintain at least a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the M.S., a course mark below C is unsatisfactory and will not be counted toward fulfilling requirements for the degree.

Master's Degree Requirements

The requirements for an M.S. degree include the following:

1. 30 semester hours of coursework, of which 24 hours must be numbered 5000 or above, and at least 15 semester hours must be from ATOC graduate courses, including four of the core ATOC courses. See specific ATOC course requirements for the M.S. below.
2. Successful completion of a written final examination based on ATOC regular coursework. The ATOC Comprehensive Exam I can be used to satisfy this requirement.
3. Completion of all degree requirements within 4 years of the date of commencing course work, but normally in 2 years. Students may petition the Graduate School for extension(s).

Note: Students planning to pursue a Ph.D. degree may elect to obtain the M.S. degree, but this is not requirement for advancement to the Ph.D. program.

Course Requirements

1. Up to 6 semester hours of approved 3000- and 4000-level coursework from engineering, math, physics, chemistry, or biology may be applied toward the M.S. degree. No credit will be given toward the M.S. degree for ATOC coursework below the 5000 level.
2. A minimum of 15 semester hours from ATOC lecture courses (independent study courses cannot be used to satisfy this requirement).
3. A total of four ATOC core courses, or their equivalent, within one of the two tracks of ATOC core courses. The Master's degree will be a M.S. in Atmospheric and Oceanic Sciences, regardless of track chosen. The Master's thesis is not constrained by choice of track.
4. Up to 3 semester hours of independent study (ATOC 5900), ATOC 6700 Weather Forecasting Seminar, and/or seminar (ATOC 6020) may be used toward the 30 hours of regular coursework in the degree requirements.
5. Up to 9 semester hours may be transferred from another accredited institution and applied toward an M.S. degree. Credit for ATOC core coursework must be approved by the graduate advisor.

ii. Comprehensive exam I (written)

The Comprehensive Examination is conducted in two parts, referred to as "Comps I" and "Comps II". COMPS I is a written exam that is taken in the first or second year of the program. The COMPS I requirements are different for students who follow the atmosphere track vs the oceanography track (see details below). COMPS II is an oral exam based upon a written report of original student research. Successful completion of the Comprehensive Examination is required before a student is admitted into Ph.D. candidacy.

Comps I Atmosphere Track

The Exam may be taken no later than during the second year for students that have been continuously enrolled as full time students. Students may opt to take the Exam during the first year so long as they recognize that this counts towards their two attempts to pass.

- Comps I is a proctored written exam (closed book). The time allocated for the Exam is 6 hours (9AM-noon and 1PM-4PM with a one hour lunch break). Typically the exam is offered on the Friday before classes start in the spring semester.
- Calculators and one single-sided page (8.5"x11" or smaller with a 1" margin) of notes for each of the 6 areas referenced below (6 pages total, no more than 1 page for each area) are allowed. Each page may contain text, graphs, and/or equations deemed relevant to the main ideas and techniques presented in the courses. Font size should be equivalent to 10 point or larger, or, if the notes are hand written they should be easily readable without magnification. The sheets will be checked at the exam. Books, and lap-top type computers are not permitted.
- Each candidate must answer 5 out of 6 questions, one on each of the core courses in the Atmosphere Track. Students must indicate before the exam which track they have chosen.
- Partial credit is given.

- Candidates who fail the exam must retake the exam the following year. Only one retake is allowed. The ATOC faculty may judge that a candidate has demonstrated mastery of individual subjects while failing the exam as a whole. In that case, a candidate must retake the exam, but they shall not answer questions for subjects in which they have already demonstrated mastery. On the retake, these candidates must select questions from subjects they either did not answer on the first attempt, or in which they did not demonstrate mastery. On the retake, a candidate must answer the number of questions required so that the number of questions on which the candidate demonstrated mastery on the first attempt plus the number they answered on the retake is equal to 5. The time for the exam will be pro-rated based on the number of questions to be answered.

To prepare for the exam, students should take all 6 of the ATOC core courses in the Atmosphere Track (or transfer in the equivalent). A notebook of questions and solutions from previous exams can be obtained from the Graduate Program Assistant. The examination material corresponds to the topics listed under the course syllabi for the A-track core courses.

Comps I Oceanography Track

The Exam may be taken no later than during the second year for students that have been continuously enrolled as full time students. Students may opt to take the Exam during the first year so long as they recognize that this counts towards their two attempts to pass.

- Comps I is a proctored written exam (closed book). The time allocated for the Exam is 6 hours (9AM-noon and 1PM-4PM with a one hour lunch break). Typically the exam is offered on the Friday before classes start in the spring semester.
- Calculators and one single-sided page (8.5"x11" or smaller with a 1" margin) of notes for each of the 5 areas referenced below (5 pages total, no more than 1 page for each area) are allowed. Each page may contain text, graphs, and/or equations deemed relevant to the main ideas and techniques presented in the courses. Font size should be equivalent to 10 point or larger, or, if the notes are hand written they should be easily readable without magnification. The sheets will be checked at the exam. Books, and lap-top type computers are not permitted.
- Each candidate must answer 5 out of 5 questions, one on each of the required core courses in the Oceanography Track.
- Partial credit is given.
- Candidates who fail the exam must retake the entire exam the following year. Only one retake is allowed.

To prepare for the exam, students should take all 5 of the required ATOC core courses in the Oceanography Track (or transfer in the equivalent). A notebook of questions and solutions from previous exams can be obtained from the Graduate Program Assistant. The examination material corresponds to the topics listed under the course syllabi for the O-track core courses.

Every effort is made to insure fairness in formulating and grading the questions. The questions are collectively considered by an Examination Committee, which includes several students that are

Ph.D. candidates. Each student taking the exam is assigned a letter designation, so that the papers are anonymous to the faculty grading the question. Each question is graded separately by 2 faculty members – the faculty member that wrote the exam question and an additional faculty member that has expertise in the subject area. The decision as to whether a student passes the Exam is made by the entire ATOC faculty. While grades vary from year to year and from question to question based upon difficulty of the questions, a total score of 70% or higher is typically a passing score. Students are informed of the outcome of the Exam within 3 weeks of the Exam.

b. Master's degree with thesis

i. Academic standards and coursework requirements

Academic Standards

A student is required to maintain at least a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the M.S., a course mark below C is unsatisfactory and will not be counted toward fulfilling requirements for the degree.

Master's Degree Requirements

The requirements for an M.S. degree include the following:

1. 30 semester hours of coursework, of which 24 hours must be numbered 5000 or above, and at least 15 semester hours must be from ATOC graduate courses, including four of the core ATOC courses. See specific ATOC course requirements for the M.S. below.
2. A minimum of 4 (but no more than 6) thesis hours. Note: thesis credit hours can be counted toward the total 30 hours of coursework and the 15 hours of ATOC coursework requirement.
3. Successful completion of a M.S. thesis and oral final examination based on this thesis.
4. Completion of all degree requirements within 4 years of the date of commencing course work, but normally in 2 years. Students may petition the Graduate School for extension(s).

Note: Students planning to pursue a Ph.D. degree may elect to obtain the M.S. degree, but this is not requirement for advancement to the Ph.D. program.

Course Requirements

1. Up to 6 semester hours of approved 3000- and 4000-level coursework from engineering, math, physics, chemistry, or biology may be applied toward the M.S. degree. No credit will be given toward the M.S. degree for ATOC coursework below the 5000 level.
2. A minimum of 15 semester hours from ATOC lecture courses (independent study courses cannot be used to satisfy this requirement).
3. A total of four ATOC core courses, or their equivalent, within one of the two tracks of ATOC core courses. The Master's degree will be a M.S. in Atmospheric and Oceanic Sciences, regardless of track chosen. The Master's thesis is not constrained by choice of track.

4. Up to 3 semester hours of independent study (ATOC 5900), ATOC 6700 Weather Forecasting Seminar, and/or seminar (ATOC 6020) may be used toward the 24 hours of regular coursework in the degree requirements.
5. A minimum of 4 (but no more than 6) thesis hours. Note: thesis credit hours can be counted toward the total 30 hours of coursework and the 15 hours of ATOC coursework requirement.
6. Up to 9 semester hours may be transferred from another accredited institution and applied toward an M.S. degree. Credit for ATOC core coursework must be approved by the graduate advisor.

Guidelines for M.S. Thesis

The M.S. thesis must consist of original and independent research conducted by the graduate student under the supervision of the faculty advisor. The thesis topic must be related to the major field, and:

1. Represent the equivalent of 4 to 6 semester hours of course work.
2. Receive the approval of the major department at least 30 days before commencement at which the degree is to be conferred.
3. Be completed at the time the final examination is held.
4. Comply with the University of Colorado Graduate School Thesis and Dissertation Specifications.
5. Be filed with the Graduate School by posted deadlines for the semester for which the degree is to be conferred.

M.S. Thesis Exam Committee

The examination committee for the M.S. final exam will consist of three graduate faculty members, at least two of whom must be ATOC core or research faculty members. The examination consists of a 30 minute oral presentation given by the candidate on the thesis subject, followed by a period of questions for the candidate by the committee. The oral presentation is open to anyone that wishes to attend. The full examination typically does not exceed two hours in duration.

ii. Comprehensive exam I (written)

The Comprehensive Examination is conducted in two parts, referred to as “Comps I” and “Comps II”. COMPS I is a written exam that is taken in the first or second year of the program. The COMPS I requirements are different for students who follow the atmosphere track vs the oceanography track (see details below). COMPS II is an oral exam based upon a written report of original student research. Successful completion of the Comprehensive Examination is required before a student is admitted into Ph.D. candidacy.

Comps I Atmosphere Track

The Exam may be taken no later than during the second year for students that have been continuously enrolled as full time students. Students may opt to take the Exam during the first year so long as they recognize that this counts towards their two attempts to pass.

- Comps I is a proctored written exam (closed book). The time allocated for the Exam is 6 hours (9AM-noon and 1PM-4PM with a one hour lunch break). Typically the exam is offered on the Friday before classes start in the spring semester.
- Calculators and one single-sided page (8.5"x11" or smaller with a 1" margin) of notes for each of the 6 areas referenced below (6 pages total, no more than 1 page for each area) are allowed. Each page may contain text, graphs, and/or equations deemed relevant to the main ideas and techniques presented in the courses. Font size should be equivalent to 10 point or larger, or, if the notes are hand written they should be easily readable without magnification. The sheets will be checked at the exam. Books, and lap-top type computers are not permitted.
- Each candidate must answer 5 out of 6 questions, one on each of the core courses in the Atmosphere Track. Students must indicate before the exam which track they have chosen.
- Partial credit is given.
- Candidates who fail the exam must retake the exam the following year. Only one retake is allowed. The ATOC faculty may judge that a candidate has demonstrated mastery of individual subjects while failing the exam as a whole. In that case, a candidate must retake the exam, but they shall not answer questions for subjects in which they have already demonstrated mastery. On the retake, these candidates must select questions from subjects they either did not answer on the first attempt, or in which they did not demonstrate mastery. On the retake, a candidate must answer the number of questions required so that the number of questions on which the candidate demonstrated mastery on the first attempt plus the number they answered on the retake is equal to 5. The time for the exam will be pro-rated based on the number of questions to be answered.

To prepare for the exam, students should take all 6 of the ATOC core courses in the Atmosphere Track (or transfer in the equivalent). A notebook of questions and solutions from previous exams can be obtained from the Graduate Program Assistant. The examination material corresponds to the topics listed under the course syllabi for the A-track core courses.

Comps I Oceanography Track

The Exam may be taken no later than during the second year for students that have been continuously enrolled as full time students. Students may opt to take the Exam during the first year so long as they recognize that this counts towards their two attempts to pass.

- Comps I is a proctored written exam (closed book). The time allocated for the Exam is 6 hours (9AM-noon and 1PM-4PM with a one hour lunch break). Typically the exam is offered on the Friday before classes start in the spring semester.
- Calculators and one single-sided page (8.5"x11" or smaller with a 1" margin) of notes for each of the 5 areas referenced below (5 pages total, no more than 1 page for each area) are allowed. Each page may contain text, graphs, and/or equations deemed relevant to the main

ideas and techniques presented in the courses. Font size should be equivalent to 10 point or larger, or, if the notes are hand written they should be easily readable without magnification. The sheets will be checked at the exam. Books, and lap-top type computers are not permitted.

- Each candidate must answer 5 out of 5 questions, one on each of the required core courses in the Oceanography Track.
- Partial credit is given.
- Candidates who fail the exam must retake the entire exam the following year. Only one retake is allowed.

To prepare for the exam, students should take all 5 of the required ATOC core courses in the Oceanography Track (or transfer in the equivalent). A notebook of questions and solutions from previous exams can be obtained from the Graduate Program Assistant. The examination material corresponds to the topics listed under the course syllabi for the O-track core courses.

Every effort is made to insure fairness in formulating and grading the questions. The questions are collectively considered by an Examination Committee, which includes several students that are Ph.D. candidates. Each student taking the exam is assigned a letter designation, so that the papers are anonymous to the faculty grading the question. Each question is graded separately by 2 faculty members – the faculty member that wrote the exam question and an additional faculty member that has expertise in the subject area. The decision as to whether a student passes the Exam is made by the entire ATOC faculty. While grades vary from year to year and from question to question based upon difficulty of the questions, a total score of 70% or higher is typically a passing score. Students are informed of the outcome of the Exam within 3 weeks of the Exam.

iii. Master's thesis exam committee

The examination committee for the M.S. final exam will consist of three graduate faculty members, at least two of whom must be ATOC core or research faculty members. The examination consists of a 30 minute oral presentation given by the candidate on the thesis subject, followed by a period of questions for the candidate by the committee. The oral presentation is open to anyone that wishes to attend. The full examination typically does not exceed two hours in duration.

iv. Master's thesis and defense

M.S. Thesis Exam Committee

The examination committee for the M.S. final exam will consist of three graduate faculty members, at least two of whom must be ATOC core or research faculty members. The examination consists of a 30 minute oral presentation given by the candidate on the thesis subject, followed by a period of questions for the candidate by the committee. The oral presentation is open to anyone that wishes to attend. The full examination typically does not exceed two hours in duration.

Guidelines for M.S. Thesis

The M.S. thesis must consist of original and independent research conducted by the graduate student under the supervision of the faculty advisor. The thesis topic must be related to the major field, and:

1. Represent the equivalent of 4 to 6 semester hours of course work.
2. Receive the approval of the major department at least 30 days before commencement at which the degree is to be conferred.
3. Be completed at the time the final examination is held.
4. Comply with the University of Colorado Graduate School Thesis and Dissertation Specifications.
5. Be filed with the Graduate School by posted deadlines for the semester for which the degree is to be conferred.

Final Examination

Each candidate for a master's degree, thesis option is required to complete a thesis defense after the other requirements for the degree have been substantially completed. The defense may be given near the end of the student's last semester while the candidate is still taking required courses.

The following rules apply to the final thesis defense:

1. A student must be registered on the Boulder campus as a regular degree-seeking student during the semester the examination is passed.
2. Notice of the defense must be filed by the major department in the Graduate School at least two weeks prior to the defense. The defense must be scheduled not later than the posted deadline for the semester in which the degree is to be conferred.
3. The defense is given by a committee composed of three Graduate Faculty members appointed by the Dean of the Graduate School. The chair of the committee must have a regular or tenured Graduate Faculty appointment.
4. The defense must cover the thesis, which should be essentially complete.
5. A student must have an affirmative vote from the majority of the committee members to pass. A student who fails the thesis defense may attempt it once more after a period of time determined by the examining committee.

c. Doctoral degree

i. Academic standards and coursework requirements

Academic Standards

A student is required to maintain a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the Ph.D., a course grade of C+ or below is unsatisfactory and will not be counted toward fulfilling requirements for the degree.

Doctoral Degree Requirements

The requirements for a Ph.D. degree include the following:

1. 36 semester hours of regular coursework, of which 30 hours must be numbered 5000 or above, and at least 18 semester hours must be from ATOC graduate lecture courses, including core ATOC course requirements.
2. 30 semester hours of dissertation credit with no more than 10 having been accrued prior to the semester the comprehensive examination was passed. Up to 10 hours of dissertation credit may also be taken during the semester the comprehensive examination is passed. Note: students can take a maximum of 10 dissertation credit hours per semester, and a total of 15 credit hours of combined dissertation and general class hours per semester.
3. Successfully passing the Ph.D. Comprehensive Examinations (COMPS I and COMPS II).
4. Completing a Ph.D. dissertation, with successful defense of the dissertation in a Final Examination.
5. The minimum residence requirement for a Ph.D. is six semesters beyond the attainment of an acceptable bachelor's degree. During this time a student must be full-time. (Two semesters enrolled in a Master's degree program from another institution may be counted towards this requirement).
6. A student is required to register continuously, fall and spring semesters of each year, beginning with the semester following the passing of the Comprehensive Examinations and extending through the semester in which the dissertation is defended (final examination). Students should complete all requirements for the degree within six years of commencing work in the doctoral program, but may petition the Graduate School for extension(s).

Course Requirements

1. All courses taken for the Master's degree at the 5000 level or above at the University of Colorado may be applied toward the Doctoral degree at the University.
2. Up to 6 semester hours of approved 3000- and 4000-level coursework from engineering, math, physics, chemistry, or biology may be applied toward the Ph.D. degree. No credit will be given toward the Ph.D. degree for ATOC coursework below the 5000 level.
3. A minimum of 18 semester hours must be taken from ATOC lecture courses. Note: independent study courses and/or seminar courses are not considered lecture courses.
4. All Ph.D. students are required to take a total of six ATOC core courses, or their equivalent, from one of the ATOC core course tracks. The doctoral degree will be a PhD in Atmospheric and Oceanic Sciences, regardless of track chosen. The doctoral dissertation is not constrained by choice of track.

5. One graduate-level mathematics course must be taken from the following approved list:

ASTR 5540: Mathematical Methods
APPM xxxx: Any course with number at the 4000 level or above
ASEN 5227: Mathematics for Aerospace Engineering Sciences 1
ASEN 5417: Numerical Computations
ASEN 5327: Computational Fluid Dynamics
CVEN 5833: Advanced Data Analysis Techniques
CVEN 6833: Advanced Data Analysis
PHYS 5030: Intermediate Mathematical Physics 1
PHYS 5040: Intermediate Mathematical Physics 2

In exceptional cases, the math requirement can be fulfilled through demonstrated, prolonged application of advanced mathematics. This option must be approved by the student's committee and is intended primarily for professionals with ten+ years of experience in advanced applications of mathematics outside of graduate school

6. Both A-track and O-track students must take at least one semester of ATOC 6020 – Seminar: Weather Forecasting AFTER completing ATOC 5050 – Introduction to Atmospheric Dynamics or the equivalent.

7. Up to 6 semester hours of independent study (ATOC 5900), ATOC 6700 Weather Forecasting Seminar, and/or seminar (ATOC 6020) may be used toward the 36 hours of regular coursework in the degree requirements.

8. Up to 21 semester hours may be transferred from another accredited institution and applied toward a Ph.D. degree. 9 of the remaining 15 semester hours must be ATOC courses. However, students must still satisfy the ATOC core course requirement either by taking ATOC core courses or transferring like courses contingent upon approval by the grad advisor.

Comprehensive Examinations

A student must pass the Ph.D. Comprehensive Examination before admission into Ph.D. candidacy. The Comprehensive Examination is given in two parts, which are referred to as "Comps I" and "Comps II".

Comps I consists of a written, closed book examination based on coursework from the student's selected track. Students who fail to pass the exam after the second attempt will be dismissed from the Ph.D. program.

After completing and passing Comps I, a student is eligible to apply for candidacy for the Ph.D. degree. Before admission into candidacy, the student must pass Comps II, which is an oral exam based primarily upon a written document that represents original research by the student, and complete the requisite course work. An "Exam Request Form" and the "Application for Admission to Candidacy for and Advanced Degree" must be submitted to the Graduate School at least two weeks

in advance of the Comps II exam. A successful candidate must receive the affirmative votes of a majority of the members of the examining board. The student is suspended automatically by the Graduate School after a second failure.

PhD Exam Committee

The student will establish a Ph.D. committee of at least 5 members of the CU graduate faculty. Three of the committee members must be regular CU faculty members, comprised of 2 ATOC core faculty or research faculty, and one faculty member outside the ATOC core faculty. The remaining committee members may be regular faculty members or others (including scientists from other institutions) that have been approved as members of the CU Graduate Faculty. The Chair of the Ph.D. Committee must be a regular CU faculty member. The membership of this committee must be approved by the Department Chair and the Graduate School. This committee will serve as the examining board for the Comprehensive Examination and the Final Examination and is expected to meet with the student on an annual basis (Note: the membership of this committee may differ from that of the Comps II Exam committee).

Final Examination

After a preliminary copy of the dissertation has been accepted for defense by the student's committee, a final examination on the dissertation and related topics is conducted. The following rules must be observed:

1. A student must be registered as a regular degree student on the Boulder Campus for a minimum of 5 dissertation hours during the semester in which the final examination is scheduled.
2. The examination consists of an oral presentation given by the candidate on the dissertation subject, followed by a period of questions for the candidate by the committee. The oral presentation is open to anyone who wishes to attend. The full examination typically does not exceed two hours.
3. The examination will be conducted by the Ph.D. Committee.
4. More than one dissenting vote will result in failure. In case of failure, the examination may be attempted once more. A second failure will result in automatic suspension by the Graduate School. Signatures from 5 committee members are required.
5. Students must notify the Graduate School at least two weeks in advance of the scheduled date of the final examination.

Doctoral Dissertation

A dissertation based on original investigation and showing mature scholarship and critical judgment, as well as familiarity with tools and methods of research, must be written on a subject approved by the student's Ph.D. committee. Each dissertation presented in partial fulfillment of the doctoral degree must:

1. Comply with the “University of Colorado Graduate School Thesis and Dissertation Specifications.”
2. Be filed with the Graduate School by the posted deadline for the semester in which the degree is to be conferred.

ii. Comprehensive exam I (written)

The Comprehensive Examination is conducted in two parts, referred to as “Comps I” and “Comps II”. COMPS I is a written exam that is taken in the first or second year of the program. The COMPS I requirements are different for students who follow the atmosphere track vs the oceanography track (see details below). COMPS II is an oral exam based upon a written report of original student research. Successful completion of the Comprehensive Examination is required before a student is admitted into Ph.D. candidacy.

Comps I Atmosphere Track

The Exam may be taken no later than during the second year for students that have been continuously enrolled as full time students. Students may opt to take the Exam during the first year so long as they recognize that this counts towards their two attempts to pass.

- Comps I is a proctored written exam (closed book). The time allocated for the Exam is 6 hours (9AM-noon and 1PM-4PM with a one hour lunch break). Typically the exam is offered on the Friday before classes start in the spring semester.
- Calculators and one single-sided page (8.5”x11” or smaller with a 1” margin) of notes for each of the 6 areas referenced below (6 pages total, no more than 1 page for each area) are allowed. Each page may contain text, graphs, and/or equations deemed relevant to the main ideas and techniques presented in the courses. Font size should be equivalent to 10 point or larger, or, if the notes are hand written they should be easily readable without magnification. The sheets will be checked at the exam. Books, and lap-top type computers are not permitted.
- Each candidate must answer 5 out of 6 questions, one on each of the core courses in the Atmosphere Track. Students must indicate before the exam which track they have chosen.
- Partial credit is given.
- Candidates who fail the exam must retake the exam the following year. Only one retake is allowed. The ATOC faculty may judge that a candidate has demonstrated mastery of individual subjects while failing the exam as a whole. In that case, a candidate must retake the exam, but they shall not answer questions for subjects in which they have already demonstrated mastery. On the retake, these candidates must select questions from subjects they either did not answer on the first attempt, or in which they did not demonstrate mastery. On the retake, a candidate must answer the number of questions required so that the number of questions on which the candidate demonstrated mastery on the first attempt plus the number they answered on the retake is equal to 5. The time for the exam will be pro-rated based on the number of questions to be answered.

To prepare for the exam, students should take all 6 of the ATOC core courses in the Atmosphere Track (or transfer in the equivalent). A notebook of questions and solutions from previous exams can be obtained from the Graduate Program Assistant. The examination material corresponds to the topics listed under the course syllabi for the A-track core courses.

Comps I Oceanography Track

The Exam may be taken no later than during the second year for students that have been continuously enrolled as full time students. Students may opt to take the Exam during the first year so long as they recognize that this counts towards their two attempts to pass.

- Comps I is a proctored written exam (closed book). The time allocated for the Exam is 6 hours (9AM-noon and 1PM-4PM with a one hour lunch break). Typically the exam is offered on the Friday before classes start in the spring semester.
- Calculators and one single-sided page (8.5"x11" or smaller with a 1" margin) of notes for each of the 5 areas referenced below (5 pages total, no more than 1 page for each area) are allowed. Each page may contain text, graphs, and/or equations deemed relevant to the main ideas and techniques presented in the courses. Font size should be equivalent to 10 point or larger, or, if the notes are hand written they should be easily readable without magnification. The sheets will be checked at the exam. Books, and lap-top type computers are not permitted.
- Each candidate must answer 5 out of 5 questions, one on each of the required core courses in the Oceanography Track.
- Partial credit is given.
- Candidates who fail the exam must retake the entire exam the following year. Only one retake is allowed.

To prepare for the exam, students should take all 5 of the required ATOC core courses in the Oceanography Track (or transfer in the equivalent). A notebook of questions and solutions from previous exams can be obtained from the Graduate Program Assistant. The examination material corresponds to the topics listed under the course syllabi for the O-track core courses.

Every effort is made to insure fairness in formulating and grading the questions. The questions are collectively considered by an Examination Committee, which includes several students that are Ph.D. candidates. Each student taking the exam is assigned a letter designation, so that the papers are anonymous to the faculty grading the question. Each question is graded separately by 2 faculty members – the faculty member that wrote the exam question and an additional faculty member that has expertise in the subject area. The decision as to whether a student passes the Exam is made by the entire ATOC faculty. While grades vary from year to year and from question to question based upon difficulty of the questions, a total score of 70% or higher is typically a passing score. Students are informed of the outcome of the Exam within 3 weeks of the Exam.

iii. Comprehensive exam II (oral)

Comps II

Successful completion of the Comps II is required before a student is admitted into Ph.D. candidacy. The following are guidelines for the comprehensive examination:

1. At least one week before the Exam, the candidate must provide each member of the Ph.D. committee with a written document representing original research by the student.
2. The form "Application for Admission to Candidacy for an Advanced Degree" must be completed in duplicate by the student. The copy is for departmental use; the original is for the Graduate School. The application must be submitted to the Graduate School at least 14 days before the Comps II Exam is taken.
3. The COMPS II exam must be taken by November 15 of the third year. This assumes that COMPS I was first attempted during January of the second year; exceptions will be dealt with on a case-by-case basis. The student is responsible for scheduling the Examination. If the student is not ready for the examination at this time or if committee member travel schedules preclude scheduling, the student should submit an Official Request for Time Extension. Failure to take the exam in the allotted time frame constitutes a failure of the exam (see #6 below).
4. The Comps II Exam typically requires 2 hours. The candidate makes an oral presentation on the research, typically of about 40 minutes duration, for which attendance is open. The remainder of the Exam consists of questions directed to the candidate by the committee members (closed attendance; only the candidate and the committee). The questions typically pertain to the subject matter and content of the research, but may also be asked on topics outside this area, at the committee's discretion.
5. The Exam is conducted by the Ph.D. Committee. The student's advisor cannot be the chair of the Examination Committee (although the advisor typically serves on the Committee).
6. A successful candidate must receive the affirmative votes of a majority of the members of the examining board. In case of failure, the examination may be attempted once more after a period of time determined by the Ph.D. committee, which typically does not exceed 3 months. The student is automatically suspended after a second failure.

GOALS and EXPECTATIONS

The goal of the second comprehensive exam (COMPS II) is to demonstrate the candidate's ability to conduct independent research. The objective is not to eliminate poor students, but to teach students how to do research, and confirm they are learning the process. COMPS II consists of writing a paper on, and orally presenting the results of, a research project. The oral presentation is followed by questions from a 5-member exam committee (which is selected by the student). The questions are meant to probe whether the student is familiar with the literature in the area, whether they understand the basic techniques and science related to the problem, and whether they have the ability to work and generate research ideas independently. Generally it is desirable that the research be of a quality that could be published, or lead to something later that could be published. Indeed at this point some students are able to submit (or have already submitted) a paper on their Comps II project to a peer-reviewed journal.

Occasionally some students have trouble with COMPS II. A common problem is that students are not given a well defined problem by their advisor that is uniquely their own, as opposed to a group

effort. Students have to demand a problem from their advisors that is well defined, and depends mainly on their own work. If a student is uncertain about the problem, they should form their exam committee early and have the committee assess the problem. Another common issue is that some projects take longer than expected, resulting in a delay in taking the exam. In this event, the student should discuss the delay with their committee to ensure that they are proceeding as efficiently as possible in a fruitful direction. Rarely a student's project is destroyed by events beyond their control, such as a satellite malfunction. This can result in a very substantial delay. In this case a new question related to the thesis (so that the thesis is not delayed) may be posed, and the Comps delayed until that project is developed. Such a decision would need to be approved by the ATOC Chair, in consultation with the ATOC graduate advisor.

If the student is funded as a research assistant, then the research topic is typically selected to fall within the scope of the research grant providing the financial support for the student. However, the student is expected to select and articulate their own research topic. Varying degrees of guidance may be provided by the research advisor and other members of the research group; it is generally expected that the research advisor will work closely with the student to ensure the research project is of publication quality. However, the student must still demonstrate the ability to conduct independent research.

The length of the research papers of successful candidates has varied widely. A typical length is 25 pages; 10 pages is likely to be too short, while 40 pages may be unnecessarily long. A successful written research paper and examination convinces the Ph.D. committee that the candidate has:

- A thorough understanding of the research literature in the chosen field
- Addressed an original research problem
- Familiarity with the tools and methods of research
- Demonstrated a capability to conduct independent research
- The writing skills to satisfactorily communicate their research

Ph.D. Exam Committee

The student will establish a Ph.D. committee of at least 5 members of the CU graduate faculty. Three of the committee members must be regular CU faculty members, comprised of 2 ATOC core faculty or research faculty, and one faculty member outside the ATOC core faculty. The remaining committee members may be regular faculty members or others (including scientists from other institutions) that have been approved as members of the CU Graduate Faculty. The Chair of the Ph.D. Committee must be a regular CU faculty member. The membership of this committee must be approved by the Department Chair and the Graduate School. This committee will serve as the examining board for the Comprehensive Examination and the Final Examination and is expected to meet with the student on an annual basis (Note: the membership of this committee may differ from that of the Comps II Exam committee).

Any student with a research advisor outside of ATOC (e.g., an advisor who is from another department, or a full time employee at NCAR, NOAA, etc.), must also have an academic advisor who is an ATOC core faculty member. The academic advisor should be identified by the student in

collaboration with their research advisor as soon as possible, and no later than one month, after research begins. Once an ATOC faculty member agrees to act as academic advisor, it is their responsibility to communicate ATOC policies and requirements to the research advisor, and to ensure that the student is meeting all ATOC requirements and making good academic progress toward the degree. Generally, the academic advisor will also be a member, but not chair, of the student's COMPS II and dissertation committees.

iv. Doctoral committee information

The student will establish a Ph.D. committee of at least five members of the CU graduate faculty ("graduate faculty appointed"). Three of the committee members must be regular CU faculty members, comprised of two ATOC core or research faculty and one faculty member outside the ATOC core faculty. The remaining committee members may be regular faculty members or others (including scientists from other institutions) that have been approved as members of the CU Graduate Faculty ("graduate faculty appointed"). The Chair of the Ph.D. Committee must be a regular CU faculty member. The membership of this committee must be approved by the department Chair and the Graduate School. This committee will serve as the examining board for the Comprehensive Examination and the Final Examination and is expected to meet with the student on an annual basis (Note: the membership of this committee may differ from that of the Comps II Exam committee).

Any student with a research advisor outside of ATOC (e.g., an advisor who is from another department, or a full time employee at NCAR, NOAA, etc.), must also have an academic advisor who is an ATOC core faculty member. The academic advisor should be identified by the student in collaboration with their research advisor as soon as possible, and no later than one month, after research begins. Once an ATOC faculty member agrees to act as academic advisor, it is their responsibility to communicate ATOC policies and requirements to the research advisor, and to ensure that the student is meeting all ATOC requirements and making good academic progress toward the degree. Generally, the academic advisor will also be a member, but not chair, of the student's COMPS II and dissertation committees.

v. Doctoral dissertation and defense

The Ph.D. thesis is based upon original research and shows mature scholarship and critical judgment, as well as familiarity with tools and methods of research. The Ph.D. thesis differs from a M.S. thesis or a single journal publication in terms of the scope and/or originality and significance of the research.

The subject of the Ph.D. thesis should be approved by the student's Ph.D. Committee in a meeting with the student within 18 months of admission into Ph.D. candidacy. Some research advisors may request a written thesis proposal; others may require only an oral presentation. The Ph.D. Committee may provide advice on the scope and methods of the research, and will provide an assessment of the suitability of the proposed research for a Ph.D. thesis. The Ph.D. candidate is expected to meet with the committee annually to discuss research progress. A written report will be provided to the student by the research advisor after each meeting with the committee.

The content of a Ph.D. thesis should include:

- Motivation for the research
- Hypotheses, scientific questions, and/or unique observational or analytical tools addressed in the research
- Survey of relevant literature
- Description of research tools and methods
- Research results
- Conclusion that assesses the significance of the results, limitations of the research, and future applications of the research

Theses that emphasize development of observational or analytical tools (e.g. development of instrumentation or numerical models) are expected to include in the thesis research some application of the tool to a scientific problem.

The format of the thesis may be that of the conventional thesis, where individual chapters correspond to topics such as those described above. If the student has published or submitted for publication several manuscripts, the student may elect to include these manuscripts as appendices in the thesis. These manuscripts should only include those for which the student is first author (Note: student's contributions to non-first-authored papers can be included in the body of the thesis). The body of the thesis may then be relatively short, describing the overall motivation, hypotheses, tools, highlights of results (including any results not in the appendices), and conclusions.

Scheduling the Final Examination (defense) is the responsibility of the student. The student should schedule a meeting with his or her entire committee approximately one year prior to when the student thinks he or she will be ready to defend to determine if completion of the dissertation along this timeline is feasible. Scheduling of the actual defense date is normally done only after the research advisor and other committee members have read at least a draft copy of the written dissertation and have given approval to proceed with the Exam. Once the defense date has been set, the ATOC guideline for submitting a polished copy of the written dissertation to each committee member is one month prior to the date of the defense.

The format of the Final Examination (defense) is similar to that of the Comprehensive Examination. However, the entire Final Examination is open to any interested person. The candidate gives an oral presentation of the thesis research that is about 45 minutes in length. After the presentation, questions from the audience are addressed. More detailed questions are then asked by the committee members. After the Exam, the Ph.D. Committee meets in closed session to decide upon the outcome.

Ph.D. Exam Committee

The student will establish a Ph.D. committee of at least 5 members of the CU graduate faculty. Three of the committee members must be regular CU faculty members, comprised of 2 ATOC core faculty or research faculty, and one faculty member outside the ATOC core faculty. The remaining committee members may be regular faculty members or others (including scientists from other

institutions) that have been approved as members of the CU Graduate Faculty. The Chair of the Ph.D. Committee must be a regular CU faculty member. The membership of this committee must be approved by the Department Chair and the Graduate School. This committee will serve as the examining board for the Comprehensive Examination and the Final Examination and is expected to meet with the student on an annual basis (Note: the membership of this committee may differ from that of the Comps II Exam committee).

Any student with a research advisor outside of ATOC (e.g., an advisor who is from another department, or a full time employee at NCAR, NOAA, etc.), must also have an academic advisor who is an ATOC core faculty member. The academic advisor should be identified by the student in collaboration with their research advisor as soon as possible, and no later than one month, after research begins. Once an ATOC faculty member agrees to act as academic advisor, it is their responsibility to communicate ATOC policies and requirements to the research advisor, and to ensure that the student is meeting all ATOC requirements and making good academic progress toward the degree. Generally, the academic advisor will also be a member, but not chair, of the student's COMPS II and dissertation committees.

Final Examination

After a preliminary copy of the dissertation has been accepted for defense by the student's committee, a final examination on the dissertation and related topics is conducted. The following rules must be observed:

1. A student must be registered as a regular degree student on the Boulder Campus for a minimum of 5 dissertation hours during the semester in which the final examination is scheduled.
2. The examination consists of an oral presentation given by the candidate on the dissertation subject, followed by a period of questions for the candidate by the committee. The oral presentation is open to anyone who wishes to attend. The full examination typically does not exceed two hours.
3. The examination will be conducted by the Ph.D. Committee.
4. More than one dissenting vote will result in failure. In case of failure, the examination may be attempted once more. A second failure will result in automatic suspension by the Graduate School. Signatures from 5 committee members are required.
5. Students must notify the Graduate School at least two weeks in advance of the scheduled date of the final examination.

Ph.D. Dissertation

A dissertation based on original investigation and showing mature scholarship and critical judgment, as well as familiarity with tools and methods of research, must be written on a subject approved by the student's Ph.D. committee. Each dissertation presented in partial fulfillment of the doctoral degree must:

1. Comply with the “University of Colorado Graduate School Thesis and Dissertation Specifications.”
2. Be filed with the Graduate School by the posted deadline for the semester in which the degree is to be conferred.

II. Policies and guidelines

a. Research advisor outside of ATOC

When a student has a research advisor outside of ATOC (e.g., an advisor who is from another department, or a full time employee at NCAR, NOAA, etc.), the student should have a co-advisor who is an ATOC core or research faculty member. It is not required for this co-advisor to be in the same area of research, but it is helpful if this is the case. The ATOC co-advisor will ensure that the student is meeting all ATOC requirements and making good academic progress towards the degree. As one of the first steps towards forming the student's dissertation committee, before Comps 2, this ATOC co-advisor should be identified. The student should discuss candidates for this role with their outside research advisor. Once a choice is agreed upon by the student and outside research advisor, the student should ask the faculty member if they are willing to serve as co-advisor. As at least two of the five members who serve on a student's committee must be ATOC core or research faculty, it is logical to assume that the ATOC co-advisor will be one of these two individuals.

b. ATOC grievance policy

Student Ethics

Students are expected to adhere to the highest codes of personal and professional ethics. Students who do not adhere to written guidelines regarding academic honesty, academic or research ethics, may be dealt with according to the policies for academic dishonesty, academic ethics, or research misconduct as published in the appropriate policy documents available in the Graduate School. Students found guilty of misconduct in any of these areas may have sanctions imposed, or may be dismissed from CU-Boulder.

Grievances

The designation *academic grievance* covers those problems related to academic issues. Such issues are distinguished from academic ethics cases and disciplinary cases for which separate procedures exist. Included within academic grievance cases are faculty, departmental, college or Graduate School policies affecting individual student prerogatives, deviations from stated grading procedures (excluding individual grade challenges), unfair treatment and related issues. Students who feel they have been treated unfairly or outside of normal departmental policies may file a grievance with the department in accordance with published grievance procedures.

Allegations of discrimination must be filed with the Department of Equal Opportunity and sexual harassment claims must be filed with the Office of Discrimination and Harassment.

Grievance Procedures

The department naturally hopes that students will proceed through the program without undue difficulty, but problems may arise and procedures exist for resolving them. Questions or grievances of course may be directed in the first instance to the other student(s), faculty and/or staff member(s) involved. It is recognized that for certain grievances—e.g. sexual harassment or discrimination—informal resolution may not be appropriate.

If an informal resolution proves unsatisfactory, the student may then direct his or her concerns to the Graduate Advisor. If the situation remains unresolved after consultation with the Graduate Advisor, the student may then submit a written grievance to the Department Chair for formal departmental deliberation and decision. The grievant is expected to consult with the Graduate Advisor within 30 days of the event precipitating the grievance, and, if the situation remains unresolved, the student must submit a written complaint to the Department Chair within 45 days of the event precipitating the grievance. The complaint should detail the nature of the grievance, and the requested action to remediate the grievance. The complaint is expected to include any documentation or other evidence related to the event precipitating the grievance.

Upon receipt of the grievance the department chair will ask the other student(s), faculty, and/or staff member(s) involved for a response to the grievance. The response should be received within ten (10) business days to the request unless extenuating circumstances exist.

The Department Chair at this point may rule on the grievance in writing to the grievant within 28 days of the complaint. Alternatively, within 28 days of receiving a complaint, the Chair may appoint a departmental ad hoc grievance committee to review the complaint. This committee shall consist of three members not directly involved with the grievance. Typically, the three members include the department chair, the graduate advisor, and an additional faculty member or student. If the Chair has ruled directly on the grievance and the grievant is not satisfied with the Chair's ruling, he/she may request the formation of a departmental ad hoc grievance committee to review the complaint.

In the event that the grievance is with the Chair, the written complaint should be submitted to the Associate Chair. In the event that both the Chair and the Associate Chair are deemed inappropriate by the grievant, the written complaint may be submitted to either the Graduate Advisor, or another faculty member who must then direct it to the faculty. At the discretion of the Chair, or the Associate Chair, an ad hoc grievance committee may be appointed to review and act on the grievance.

Should even this yield no solution, the student may appeal either to the Ombuds Office or to the Associate Dean in the Graduate School.

c. Part time student guidelines

ATOC Departmental Definition

A part time student is a student who does not receive financial support in the form of a graduate student appointment (teaching assistant or research assistant) from ATOC, another academic department, or university research institute.

PLEASE NOTE

This definition is separate from university and graduate school definitions of a full or part time student. This definition applies only to ATOC departmental rules. The student will still need to adhere to university and graduate school rules regarding continuous enrollment, time limits, and enrollment past the oral comprehensive exam (COMPS II).

COMPS I

According to current ATOC department rules and guidelines, graduate students are required to complete the written comprehensive exam (COMPS I) no later than January of the second year. Students may opt to take COMPS I during the first year so long as they recognize that this counts towards their two attempts to pass. Students who enter in the spring semester may take COMPS I after their first year (after two semesters) or the following January (after 4 semesters).

Part time students often do not complete the ATOC core coursework necessary for the COMPS I exam by January of the second year. Instead, the part time student is expected to complete the COMPS I exam in January following the completion of the ATOC core coursework, no later than the fourth year, and are expected to meet with an ATOC advisor yearly.

COMPS II

The oral comprehensive exam (COMPS II) must be taken by November 15 of the third year. This assumes that COMPS I was first attempted during January of the second year; exceptions will be dealt with on a case-by-case basis. The student is responsible for scheduling the examination. If the student is not ready for the examination at this time or if committee member travel schedules preclude scheduling, the student should submit an Official Request for Time Extension. Part time students are also expected to submit this official request so that the department can insure that good academic progress is being made.

A part time student is expected to complete the COMPS II exam on the same schedule as a full time student, that is by November 15 of their third year. A part time student may choose to complete the oral comprehensive exam (COMPS II) before the written comprehensive exam (COMPS I) has been accomplished. The student should carefully discuss this option with his or her research advisor and other committee members. This does not relax the requirement for the successful completion of the written comprehensive exam (COMPS I).

d. Recommended writing guides

Eloquent Science: A Practical Guide to Becoming a Better Writer, Speaker, & Atmospheric Scientist, David M. Schultz (American Meteorological Society, 2009)

The Chicago Guide to Communicating Science (Chicago Guides to Writing, Editing, and Publishing), S.L. Montgomery (University of Chicago Press, 2003)

The Elements of Style, William Strunk, E.B. White, and Maira Kalman (Penguin Press, 2005)

A Manual for Writers of Research Papers, Theses, and Dissertations, Seventh Edition: Chicago Style for Students and Researchers (Chicago Guides to Writing, Editing, and Publishing), 7th ed., Kate L. Turabian (University of Chicago Press, 2007)

George Orwell's essay *Politics and the English Language*

Winning the Games Scientists Play, Carl J. Sindermann (Basic Books, 2007)

A Short Guide to Writing About Chemistry, H.B. Davis, J.F. Tyson, & J.A. Pechenik (Pearson Education, Inc., Boston, 2010)

Writing Your Journal Article in Twelve Weeks: A Guide to Academic Publishing Success, WL Belcher (Thousand Oaks, ISBN: 9781412957014, 2009)

A Short Guide to Writing About Biology, Jan A. Pechenik (Longman; 7 edition, ISBN-10: 9780205667277, 2009)

Writing for Publication (Academic's Support Kit). D, Epstein, J. Kenway, and R. Boden (Sage Publications UK, ISBN-10: 9781412906975, 2007)

How to Write a Lot: A Practical Guide to Productive Academic Writing, Paul J. Silvia (Amer Psychological Assn, ISBN-10: 9781591477433, 2007)

How to Write and Publish a Scientific paper, Robert A Day and Barbara Gastel (Greenwood, 6th edition, ISBN-10: 9780313330407, 2006)

The Craft of Scientific Writing, Michael Alley (Springer; 3rd edition, ISBN-10: 0387947663, 1996)

e. Resources for graduate students

Navigating Graduate School and Beyond

(http://www.amazon.com/gp/product/0875907369/ref=as_li_ss_tl?ie=UTF8&camp=1789&creative=390957&creativeASIN=0875907369&linkCode=as2&tag=eloquscien-20)

A PhD is Not Enough

(http://www.amazon.com/gp/product/0201626632/ref=as_li_ss_tl?ie=UTF8&camp=1789&creative=390957&creativeASIN=0201626632&linkCode=as2&tag=eloquscien-20)

Put Your Science to Work (http://www.amazon.com/Put-Your-Science-Work-Take-Charge/dp/0875902952/ref=sr_1_1?ie=UTF8&qid=1346965898&sr=8-1&keywords=fiske+PhD)

Disability Services: Their mission is to provide students with disabilities the tools, reasonable accommodations and support services to participate fully in the academic environment. Contact 303-492-8671 or DSInfo@colorado.edu

Office of Victims Assistance (OVA): OVA provides free, confidential response services for students, faculty, staff and their significant others who experience traumatic, disturbing or disruptive life events. They do this by providing information, support and short-term counseling. OVA is not a part of the police department. Their office responds to situations involving physical assault and hazing, bias motivated incidents, death, discrimination and harassment including sexual harassment, intimate partner violence, serious accidents, sexual assault and stalking, as well as other potentially traumatic situations. They help people learn about and assess their options in these situations. Contact 303-492-8855 or assist@colorado.edu. <http://cuvictimassistance.com/about/>

Counseling and Psychological Services: They understand that graduate students face many challenges that undergraduates do not face in terms of academic demands, personal lives and career development. So their counselors are here to assist students in meeting the multiple demands placed upon them by virtue of the myriad of roles they take on and juggle on a daily basis. They also recognize that when issues arise for graduate students in one domain of their lives, it can have unintended consequences for other areas of life. These issues can negatively impact academic performance, student retention, graduation rates, and general quality of life. CAPS works collaboratively with students, faculty, and staff to create and maintain a campus environment that encourages and supports psychological well-being. They facilitate several workshops and support groups specifically directed towards graduate student needs. Contact 303-492-6766 http://counseling.colorado.edu/index.php?option=com_content&view=article&id=45&Itemid=36

Ombuds Office: They offer all members of the university community a safe place to talk about their campus-related problems. They help you identify and evaluate options and provide information. They can facilitate conversations between conflicting parties and make referrals when necessary. Contact 303-492-5077. <http://ombuds.colorado.edu/>

III. Student funding

Almost all admitted doctoral students are offered financial support from the department in the form of a Teaching Assistant or Research Assistant position. These positions include a tuition remission of 9-18 credit hours per semester, approximately 80% of health insurance costs, and a monthly stipend. Students are responsible for paying mandatory student fees, any applicable course/program fees, and the remaining costs of health insurance.

Typically, incoming PhD students are supported as a Teaching Assistant. This provides the student with the opportunity to get settled into graduate school and explore the various research opportunities available. In general, most students find a Research Assistant position by the end of the first year.

Students are strongly encouraged to apply for outside funding to support their graduate studies. Our students receive a significant number of fellowships and nationally recognized awards each year.

A master's degree (MS) is not required to receive a doctoral degree (PhD) or to apply to our doctoral program. In general, ATOC provides financial aid to only students who are seeking a PhD. If an applicant hopes to obtain a PhD, it is better to note that on the application. While applicants applying to the MS or PhD programs are held to the same academic standards and criteria, applicants seeking a terminal MS degree are less likely to receive financial assistance. Applicants are more likely to be accepted as a PhD student and more likely to receive financial assistance.

a. Assistantships, fellowships, and funding

Research Assistantships

During the academic year, graduate students who are conducting research with a faculty member typically receive a 50% research assistantship. This assistantship includes a tuition remission of 9-18 credit hours per semester, 70% of health insurance costs, and a monthly stipend. Students are responsible for paying mandatory students fees, any applicable course fees, and the remaining costs of health insurance. The student is expected to work 20 hours per week in support of the research project in return for this stipend and tuition remission. Typically, this research is directly related to the student's thesis work. During summer, students spend full time on research and typically receive a 100% research assistantship for a period of two and a half months. Note that a student does not receive paid vacations as a research assistant; 2 weeks of unpaid vacation are typically allotted during the summer. Additional (or less) vacation time is per prior agreement between the student and the advisor. Note that all research assistantships are subject to availability of federal research funds. Continuation of a research assistantship requires that a student maintain a B (3.00) GPA and perform satisfactorily in research.

Teaching Assistantships

During the academic year, some students may receive a 25% or 50% teaching assistantship. This assistantship includes a stipend for living expenses plus tuition remission depending on the percentage of the appointment.

Teaching assistants assigned to a lecture class are required to grade homework assignments, to provide written solutions to assignments, to be familiar with lecture material, to attend (or have attended in previous semesters) lectures, to proctor exams, and to grade all hourly examinations and the final examination. In addition, the lecture TA may be required to conduct occasional evening or daytime reviews for examinations.

Teaching assistants assigned to the weather laboratory are required to conduct two (2) two-hour laboratory sections each week, to prepare and deliver brief introductory material relating to each exercise, to see that the equipment is properly set up and cared for, and to grade students' laboratory notebooks and laboratory-related homework. All TA's using laboratory equipment are expected to attend training sessions in the careful use of equipment, to follow established procedures, and to report breakage and malfunctions in a timely manner.

All Teaching Assistants are expected to hold one or two office hours per week for each 25% appointment. All efforts are to be coordinated with the faculty member responsible for the course.

Fellowships/Grants/PostDoc Options

You can also apply for fellowships, so that you control your support. NSF lets you apply in the fall, NASA in the spring. EPA and DOE also have fellowships. Below are links to these opportunities:

Graduate School Information on Funding

Federal Programs and Fellowships That Provide Support for Graduate Students

This report contains a list of federal government scholarship, fellowship, and internship programs that provide support for graduate students.

The federal programs lists are organized by the agency that runs the program. Within each agency, the programs are organized by the applying entity, e.g. whether the award is given to the institutions or to individuals. For each opportunity, there is provided a program summary, eligibility requirements, size of the program, approximate size and type of award, citizenship requirements, annual due dates, and other special factors. The program websites are provided as a source for more detailed information.

http://www.asp.ucar.edu/pdf/FPTSGSU_June_2012.pdf

NSF Graduate Research Fellowship Program

The Graduate Research Fellowship Operations Center is responsible for processing applications and responding to requests for information. General inquiries regarding the Graduate Research Fellowship Program should be made to:

Graduate Research Fellowship Operations Center, telephone: 866-NSF-GRFP, 866-673-4737 (toll-free from the US and Canada) or 202-331-3542 (international). email: help@nsfgradfellows.org

For more information go to http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201

NCAR Visitor Programs for Students, Postdocs, and Scientists

Each year nearly 700 students, scientists, weather forecasters, and other professionals visit the National Center for Atmospheric Research (NCAR) and the University Corporation for Atmospheric Research Office of Programs (UOP). These visits vary both in purpose-workshops, summer internships, or collaboration on research-and in length-from a few days to several years. Formal programs either provide opportunities for visitors to pursue special training or research in Boulder, Colorado, or place them at designated research and educational institutions around the world. In addition to the formal programs described here, individual groups at NCAR or UOP may host visitors outside the scope of these specific programs.

For more information go to <http://www.ucar.edu/opportunities/opps-students.shtml>

NASA Research Opportunities

Supporting research in science and technology is an important part of NASA's overall mission. NASA solicits this research through the release of various research announcements in a wide range of science and technology disciplines. NASA uses a peer review process to evaluate and select research proposals submitted in response to these research announcements. Researchers can help NASA achieve national research objectives by submitting research proposals and conducting awarded research. This site facilitates the search for NASA research opportunities: <http://nspires.nasaprs.com/external/>

Funding Opportunities for both graduate students and faculty members

A variety of funding is available for both graduate students and faculty members wishing to pursue research or creative work opportunities. The below links provide information on fellowships, grants, research competitions, and other funding resources available both through the university and externally. For more information go to <http://www.colorado.edu/vcr/fundingawards>

NOAA's Education Resources

The Student Opportunities website is designed to provide information about educational opportunities that are available throughout NOAA. Information on scholarships, internships and fellowships including a brief description of each program; application deadline; award amount; dates

of opportunity; contact name, telephone number, and e-mail address; and website for the various opportunities are found on this site.

The Special Opportunities section contains student opportunities categorized by geographic location, underrepresented communities and opportunities specific to students with disabilities. For more information go to

http://www.education.noaa.gov/Special_Topics/Student_Opportunities.php#page=page-1

AMS: Information and Resources for Students

For more information regarding student opportunities, scholarships and fellowships, and travel grants go to <http://www.ametsoc.org/amsstudentinfo/index.html>

EPA Funding Opportunities

Find current funding opportunities at http://www.epa.gov/ogd/grants/funding_opportunities.htm

SMART Defense Scholarship/Fellowship Program for Grad Students

SMART Scholarships are awarded to applicants who are pursuing a degree in, or closely related to, one of the following STEM (science, technology, engineering, and mathematics) disciplines:

Aeronautical and Astronautical Engineering; Biosciences; Chemical Engineering; Chemistry; Civil Engineering; Cognitive, Neural, and Behavioral Sciences; Computer and Computational Sciences; Electrical Engineering; Geosciences; Information Sciences; Materials Science and Engineering; Mathematics; Mechanical Engineering; Naval Architecture and Ocean Engineering; Nuclear Engineering; Oceanography; Operations Research; Physics

SMART Fellows receive: Salary/stipend; Full tuition; Related education fees; Book allowance; Paid summer internships; Career opportunities after graduation

SMART Fellows are: Outstanding students with demonstrated ability and special aptitude in Science, Technology, Engineering & Mathematics (STEM) fields; Provided with DoD civilian science and technology employment positions upon completion of their studies. Length of employment is commensurate with scholarship/fellowship length; Employed, post degree, at labs affiliated with DoD civilian sites, such as the National Security Agency and the Defense Intelligence Agency; Undergraduate, graduate, and doctoral students; At least 18 years of age and are United States citizens; Already enrolled in a U.S. college or university.

In accordance with Federal statutes and regulations, no person on the grounds of race, color, age, sex, national origin or disability shall be excluded from participating in, denied the benefits of, or be subject to discrimination under any program activity receiving financial assistance from the Department of Defense.

For more information and to apply: <http://www.asee.org/smart>

Questions? Contact
smart@asee.orgsmart@asee.org

National Defense Science and Engineering Graduate Fellowship

The Department of Defense (DoD) is committed to increasing the number and quality of our nation's scientists and engineers. Toward that end, the DoD annually supports approximately 8,000 graduate students in fields important to national defense needs.

The DoD's support is evidenced in a number of ways. First and foremost, the DoD funds thousands of graduate students, who are members of research teams, through contracts and grants. Selected by research faculty, the students engage in fundamental studies under the leadership of a senior researcher while earning advanced degrees. These students are generally wholly supported by their DoD grant or contract.

Another important mechanism for DoD support of graduate students is through portable fellowships awarded to U.S. citizens or nationals following a competition each year. These fellowships allow the recipients to pursue their graduate studies at whichever U.S. institution they choose to attend. One of these is the National Defense Science and Engineering Graduate (NDSEG) Fellowship, which is highly competitive and confers high honors upon its recipients. The DoD has awarded approximately 2,200 NDSEG fellowships since the program's inception 17 years ago.

For info and to apply: www.asee.org/ndseg <<http://www.asee.org/ndseg>>

In accordance with Federal statutes and regulations, no person on the grounds of race, color, age, sex, national origin or disability shall be excluded from participating in, denied the benefits of, or be subject to discrimination under any program activity receiving financial assistance from the Department of Defense.

Marie Curie Action: International Incoming Fellowship (IIF)

Deadline is August 11th, info is on page 23 and 40 (section 4.2.):

http://www.humboldt-foundation.de/pls/web/docs/F17590/Arbeitsprogramm_Menschen_2011.pdf

http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.FP7DetailsCallPage&call_id=396#info
pack

<http://www.humboldt-foundation.de/web/3371.html>

Humboldt Research Fellowship for Postdoctoral Researchers

<http://www.humboldt-foundation.de/web/humboldt-fellowship-postdoc.html>

No deadline and must complete doctorate within 6 months of applying. Can't apply for this and above at the same time, but if I am denied the above one then I can apply for this one. Selection committees meet in March, July and November. The Fellowship can begin 2-3 months after it is awarded.

DAAD – November 15 for 10 month and short-term grants, May 15th for short-term grants

<http://www.daad.org/?p=gradresearch#terms>

International Research Fellowship Program

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5179&org=NSF

NSF, so the application process is tedious, but the deadline for this is September 13th

Fulbright Fellowship

http://www.cies.org/us_scholars/us_awards/ and <http://catalog.cies.org/> for searching the different awards. I did a search for Germany and found some, here's the link: <http://catalog.cies.org/index.aspx>. Number 2233 seems to be best.

IIASA Postdoc

www.iasa.ac.at/pdocs/ – Seems to focus on studying climate, energy and population problems, then presenting solutions that a policy maker could implement. This is in Laxenburg, Austria.

National Academies

www.national-academies.org/rap or <http://sites.nationalacademies.org/pga/rap/>
2011 Application cycle is: February 1, May 1, August 1, November 1. Applicants should contact prospective Adviser(s) at government lab(s) and affiliated institutions to discuss their research interests and funding opportunities prior to the application deadline.

Naval Research Laboratory Postdoc

Can apply anytime but must have PhD prior to appointment date. <http://nrl.asee.org/> Need to get in contact with a researcher who has similar interests before starting proposal.

ASP Postdoctoral Fellowship

http://www.asp.ucar.edu/pdftp/postdoc_fellowship.php
Applications are due January 5th and decisions are made by the end of March. Applicant must have a PhD or Sc.D. or have completed their Ph.D. (including thesis revisions and defense) before starting NCAR appointment. Appointments usually begin between June and October.

CIRES Visiting Fellowship Opportunities

<http://cires.colorado.edu/collaboration/fellowships/>
This fellowship applies to recent grads and those who have been in the field for a while. There are 6

themes with CIRES and I think I'd fit into the Advanced Modeling and Observing Systems one. It's not a solid fit but could work depending on what people are doing. Deadline is December 28th.

President's Postdoctoral Fellowship Program

<http://www.ucop.edu/acadpersonnel/ppfp/>

Can work with anyone in the UC system (10 campuses), just have to talk to them and have them agree. Application deadline is November 1st and must have earned your PhD by June 30th of appointment year. Each award is a 12 month period starting July 1st usually and can be renewed for up to 5 years. Pay is \$40,000-\$50,000, a little low, but you get 4 weeks of paid vacation a year.

Oak Ridge National Laboratory

<http://www.ornl.gov/postdocs/ornl-pd-pm/default.aspx>

List of Postdoc and PostMasters job opportunities/positions

Princeton Postdoctoral and Visiting Scientist Program

http://www.princeton.edu/aos/postdoc_program/

I would definitely fit into the themes for this position, such as basic processes in atmospheric dynamics. All themes seem to have the overall goal of understanding climate. Submit application to jobs.princeton.edu.

T.C. Chamberlin Postdoctoral Fellowship at the University of Chicago

http://geosci.uchicago.edu/people/research_staff.shtml

Deadline is October 1st but can not find any application information, only says to e-mail chamberlin2010@geosci.uchicago.edu. Need to e-mail since the dept website is not helpful.

JPL Postdoctoral Scholars Programs

<http://postdocs.jpl.nasa.gov/programs/>

Tons of different options here

Sloan Fellowship

<http://www.sloan.org/fellowships>

For early career scientists (less than 6 years since granted Ph.D.) and need to be nominated by department heads or senior researchers. Also, should not have tenure, isn't a hard rule but is preferred. Deadline is September 15th.

Ford Fellowship

http://sites.nationalacademies.org/PGA/FordFellowships/PGA_047960

Want those of an ethnic minority but not required. Stipend is \$40,000 at a US institution and appointment has to start between June 1st and September 1st. Accepts a degree in Earth Sciences but pay/stipend is a bit low and research must further career in higher education.

SOEST Young Investigator Postdoctoral Program in Hawaii

<http://www.soest.hawaii.edu/SYI/>

It's in Hawaii, so focuses on Marine and Tropical research in the Pacific and East Asia. Fellowship can be renewed for a second year.

Army Research Laboratory Postdoctoral Fellowship Program

<http://www.oraui.org/ARLPostdocFellowship/>

No obligation to the US government but they encourage fellows to continue their research in an area that'll benefit the US military. Need to work with an adviser in the ARL laboratory. Applicants are accepted and processed on a continual basis.

b. Residency and tuition classification

Tuition classification determines if students should have *in-state* or *out-of-state* tuition. Your initial tuition classification is determined from information you supply on your application for admission to the university. You may file a petition if you wish to contest out-of-state classification status or if you become eligible for in-state status.

In brief: *In-state status will be required after one year for all students supported by the department if they are eligible.* If you are eligible, you will be required to apply for Colorado resident at the end of your first year. You will receive reminders and more information in March if this applies to you.

For first year non-resident domestic students and international students who are supported as a teaching assistant or research assistant, only the resident portion of tuition costs are charged to the department (if supported as a teaching assistant) or research grant (if supported as a research assistant). The non-resident portion of tuition costs is covered by the Provost's Office.

If an eligible, domestic student does not become a Colorado resident after the first year, the non-resident portion of tuition costs is charged to the student.

International students are not eligible to become Colorado residents. If an international student is supported as a teaching assistant or research assistant, the department or the research grant is still charged only the resident portion of tuition costs throughout their academic career. An international student will not be held responsible for the resident or non-resident portion of tuition costs as long they remain employed as a teaching assistant or research assistant. However, if a non-resident domestic student or international student is supported outside the university through an outside fellowship or employment, the student will be charged the full non-resident tuition costs.

For information on how to obtain in-state status including regulations, deadlines for applying, and the necessary forms go to the Office of the Registrar web site listed below.

http://registrar.colorado.edu/students/tuition_classification.html