

GRADUATE STUDENT HANDBOOK FOR THE GRADUATE FIELDS OF ATMOSPHERIC SCIENCES AND GEOLOGICAL SCIENCES



Department of Earth and Atmospheric Sciences

Prof. Geoff Abers, Chair

abers@cornell.edu

Director of Graduate Studies for Geological Sciences

Dr. Matt Pritchard

pritchard@cornell.edu

Director of Graduate Studies for Atmospheric Sciences

Dr. Toby Ault

tra38@cornell.edu

Graduate Programs Coordinator Geological Sciences and Atmospheric Sciences

Sierra Henry

slh97@cornell.edu

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I. INTRODUCTION

Welcome to Cornell University and the Graduate Fields of Atmospheric Sciences and Geological Sciences! We are excited that you will be joining our community of research and learning. We encourage you to read about Cornell University's core values that were adopted in the fall of 2019: <https://president.cornell.edu/initiatives/university-core-values/> In particular, we are a "A Community of Belonging: As a university founded to be a place where "...any person can find instruction..." we value diversity and inclusion, and we strive to be a welcoming, caring, and equitable community where students, faculty, and staff with different backgrounds, perspectives, abilities, and experiences can learn, innovate, and work in an environment of respect, and feel empowered to engage in any community conversation." We hope the other core values in free and open inquiry and expression, exploration across boundaries, changing lives through public engagement, purposeful discovery, and respect for the natural world will also resonate with you.

Graduate school is a very different kind of educational experience than being an undergraduate. This is where you specialize, focus, and become an expert. In most programs the primary goal is the thesis, and coursework mostly exists to give you the preparation or background you need to get there. Because of that, Cornell's graduate program has several features that may take some getting used to. These are described in more specifics in the following sections.

- First, your program has no general course requirements set by Cornell University or the Department. Rather, each student has a Special Committee who decides upon the necessary preparation and coursework. Also, you have to make satisfactory progress in coursework and research, discussed in Section IX below. Generally, coursework will become less important as your degree progresses, and instead your advisor and Committee are central to evaluating your progress.
- Second – and this is different than most other universities – the graduate programs are organized into "fields" that do not directly correspond to departments. The Department of Earth and Atmospheric Sciences (EAS) has two graduate fields (Atmospheric Sciences and Geological Sciences), but these fields include faculty in several departments besides EAS. Sometimes this can get confusing as resources generally come from departments, while academic requirements are organized by field.
- Third, although there are few requirements, graduate school requires commitment and drive. The Ph.D. program requires three exams including a thesis defense and thesis, and the M.S. requires a thesis and defense. *Your success as a graduate student generally depends on getting research done, presenting and publishing that research, and generally learning how to be a scientist.* While your advisor and committee will do what they can to help you on this path, ultimately it depends on you. Many students struggle at first with the transition to near-exclusive emphasis on long-term goals. Faculty and your fellow graduate students can be a great aid in navigating the transition.

Where to find more information?

There are many other specifics to your program, and this handbook is designed to help you keep track of them. It is one of two important documents that describe the program, the other being the Code of Legislation of the Graduate Faculty. All Graduate Students are subject to the rules and regulations of the Code of Legislation of the Graduate Faculty (<https://gradschool.cornell.edu/policies/code-of-legislation/>) and the legislation agreed upon by the faculty in the Graduate Fields of Atmospheric Sciences and Geological Sciences. These rules and regulations are briefly summarized in this handbook; additional details can be found in the Code of Legislation of the Graduate Faculty. For example, the Code includes information on the makeup of committees, degree progress and graduation requirements, financial support, conflict resolution and a lot more. Other resources are listed in section XII of this guide. If you are not sure where to find information or even what information you need, you should feel free to ask your advisor and temporary/special committee, other students and faculty, the Graduate Program Coordinator, and the Director of Graduate Studies.

A great resource for a student perspective on the EAS department and how to succeed at Cornell is the “[EAS Grad Students Guide](#)” written by EAS graduate students as a Google doc that is frequently updated:

<https://docs.google.com/document/d/1YL27VXj6M2l4FZefxPQvhiKNSoOh-iMBj6ew4gxq1zE/edit#heading=h.gjzr1hmvfel5>

Another recent resource created by members of the URGE (Unlearning Racism in the Geosciences) Pod is the EAS department resource map:

<https://urgeoscience.org/index.php?gf-download=2021%2F04%2FCornell-Earth-and-Atmospheric-Science-Cornell-University-Resource-Map-Session7.pdf&form-id=4&field-id=6&hash=09f09788f5accfe6172c2f5defb4b0e433781b82af40225e64c680ae9e8317d2>

II. GRADUATE FIELDS

At Cornell University, graduate study is governed by graduate fields, which are distinct from university departments. You are a student either in the Graduate Field of Atmospheric Science or the Graduate Field of Geological Sciences. Many of the procedures in the fields are similar, but where they are different in the document below the [text in blue describes Geological Sciences](#) and [text in red is for Atmospheric Sciences](#). While the faculty of the fields are mainly drawn from the department, it also includes faculty from such divergent departments as Classics, Astronomy, Plant Biology, Civil and Environmental Engineering and others. A list of faculty in the graduate fields is below and listing of areas of research interest concentration topics is available at the following links for [Geological Sciences](#) and [Atmospheric Sciences](#). A full list of graduate fields can be found [here](#).

Faculty in the Graduate Field of Geological Sciences

Geoffrey A. Abers – **Department Chair**
 Warren D. Allmon
 Toby R. Ault
 Larry D. Brown
 Lawrence M. Cathles (*Emeritus*)
 Louis A. Derry
 Gregory P. Dietl
 Nicole Fernandez
 Patrick Fulton
 Alejandra Gandolfo
 Esteban Gazel
 Alexander G. Hayes
 Jonathan Hendricks
 Megan Holycross
 David L. Hysell
 Teresa E. Jordan (*Emeritus*)
 Robert W. Kay (*Emeritus – Graduate School Professor*)
 Suzanne M. Kay (*Emeritus*)

Kade Keranen
 Rowena B. Lohman
 Jonathan Lunine
 Natalie M. Mahowald
 Sturt W. Manning
 Gregory C. McLaskey
 Bruce Monger
 Karin Olson Hoal
 Matthew E. Pritchard – **Director of Graduate Studies**
 Sara C. Pryor
 Matt Reid
 Robert M. Ross
 Andy L. Ruina
 Britney Schmidt
 Tammo S. Steenhuis
 Jefferson W. Tester
 John F.H. Thompson
 William White (*Emeritus*)

Faculty in the Graduate Field of Atmospheric Sciences

<u>Members of the Field</u>	<u>Concentration</u>	<u>Research/Teaching Interests</u>	<u>Contact Information</u>
<u>Dr. Toby Ault</u> Associate Professor Earth and Atmospheric Science	Atmospheric Science	Climate Science Drought Spring Dynamics Tropical Meteorology	Snee Hall toby.ault@cornell.edu
<u>Dr. Rebecca Barthelmie</u> Professor Mechanical and Aerospace Engineering	Atmospheric Science	Global and Regional Climate Focus on wind shear and wind energy	252 Upson Hall rb737@cornell.edu
<u>Dr. Gregory Paul Bewley</u> Assistant Professor Mechanical and Aerospace Engineering	Atmospheric Science	Environmental turbulence	307 Upson Hall gpb1@cornell.edu

<u>Dr. Art DeGaetano</u> Professor Earth and Atmospheric Science	Atmospheric Science	Applied climatology Environmental information science Environmental management	Snee Hall atd2@cornell.edu
<u>Dr. H. Oliver Gao</u> Professor Civil and Environmental Engineering	Atmospheric Science	Air quality Transport and environment Sustainable development	314 Hollister Hall hg55@cornell.edu
<u>Dr. Stephen</u> Colucci Graduate School Professor (Emeritus)	Atmospheric Science	Weather Analysis and forecasting; large-scale atmospheric dynamics	Snee Hall sjc25@cornell.edu
<u>Dr. Peter Hess</u> Professor Biological and Environmental Engineering	Atmospheric Science	Atmospheric aerosols and climate Air quality	202 Riley Robb Hall peter.hess@cornell.edu
<u>Dr. Peter Hitchcock</u> Assistant Professor Earth and Atmospheric Science	Atmospheric Science	Large-scale atmospheric dynamics Troposphere- stratosphere interactions	Snee Hall aph28@cornell.edu
<u>Dr. Dave Hysell</u> Professor Earth and Atmospheric Science	Atmospheric Science	Radar and remote sensing Upper atmospheric physics Plasma physics Computational fluid dynamics	3114 Snee Hall David.hysell@cornell.edu
Dr. Flavio Lehner Assistant Professor Earth and Atmospheric Sciences	Atmospheric Science		Snee Hall
<u>Dr. Nikole Lewis</u> Assistant Professor Astronomy	Atmospheric Science	Planetary atmospheric processes	312 Space Science Building nk135@cornell.edu

<u>Dr. Douglas MacMartin</u> Senior Research Associate Mechanical and Aerospace Engineering	Atmospheric Science	Dynamics and feedback analysis in climate systems	561 Upson Hall <u>dgm224@cornell.edu</u>
<u>Dr. Natalie Mahowald</u> Professor Earth and Atmospheric Science	Atmospheric Science	Atmospheric dust climate modeling	Snee Hall <u>Mahowald@cornell.edu</u>
<u>Dr. Angeline Pendergrass</u> Assistant Professor Earth and Atmospheric Sciences	Atmospheric Science		Snee Hall
<u>Dr. Sara Pryor</u> Professor Earth and Atmospheric Science	Atmospheric Science	Global climate change/variability and forcing at regional scales Atmosphere-surface exchange Formation and removal processes for atmospheric aerosols	Snee Hall <u>sp2279@cornell.edu</u>
<u>Dr. Scott Steinschneider</u> Assistant Professor Biological and Environmental Engineering	Atmospheric Science	Hydroclimatic variability and change	320 Riley Robb Hall <u>ss3378@cornell.edu</u>
<u>Dr. Ke Max Zhang</u> Professor Mechanical and Aerospace Engineering	Atmospheric Science	Atmospheric chemistry Air quality	105 Upson Hall <u>kz33@cornell.edu</u>

III. SUBJECTS AND CONCENTRATIONS

Each graduate field is composed of one or more subjects of study, which are broad categories that may actually be the same as the field itself. For example, the Graduate Fields of Atmospheric Sciences offers only one subject: Atmospheric Sciences and the Graduate Field of Geological Sciences offers only one subject: Geological Sciences. Each subject may then be divided into specialized areas called concentrations. A faculty member in a graduate field represents one or more concentrations within that graduate field, and a student elects a

specific concentration by adding a faculty member who represents that concentration to their Special Committee. The chairperson represents the major subject and concentration and minor members represent minor subjects and concentrations. **The faculty member who represents a concentration on a Special Committee determines the specific requirements that the student must complete related to that concentration.**

The Graduate Field of Atmospheric Sciences currently does not have concentrations, but is petitioning to add concentrations.

A list of concentrations available within the subject of Geological Sciences is included below:

- Economic Geology
- Engineering Geology
- Environmental Geophysics
- General Geology
- Geobiology
- Geochemistry and Isotope Geology
- Geohydrology
- Geomorphology
- Geophysics
- Geotectonics
- Marine Geology (*minor*)
- Mineralogy
- Ocean Science and Technology
- Paleontology
- Petroleum Geology
- Petrology
- Planetary Geology
- Precambrian Geology
- Quaternary Geology
- Rock Mechanics
- Sedimentology
- Seismology
- Stratigraphy
- Structural Geology

IV. PROGRAMS AND DURATION

The Graduate Fields of Atmospheric Sciences and Geological Sciences both offer two graduate degree programs: the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.). The M.S. requires a written thesis; the degree is not awarded for coursework alone or by taking the Admission to Candidacy Exam as part of the Ph.D. program. Of course, the Ph.D. also requires a thesis of substantially different scope. Students seeking an M.S. degree while in the Ph.D. program must generally fulfill all requirements for both degrees, including

an M.S. thesis that does not include work in the Ph.D. thesis; this is normally accomplished by transferring from the M.S. to Ph.D. program following completion of the M.S. thesis.

Geological Sciences also offers a one-year non-thesis Masters of Engineering (M.Eng.), which is administered separately and not discussed in this Handbook.

A. M.S.

The M.S. requires only two semesters of registered full-time study, but typically takes two years to complete. The M.S. requires the completion of a written thesis. Additional requirements and expectations are developed in conjunction with your Committee. Financial support is generally offered for two years, contingent upon adequate progress of the student and on the availability of funds.

B. PH.D.

The Ph.D. requires only six semesters of registered full-time study, but typically takes five years to complete. The Ph.D. requires the completion of a written thesis. Coursework, including that required for a minor concentration, is typically an early focus (i.e. years 1-3), with thesis research occupying a progressively larger portion of the student's time over the course of his or her program. Specific requirements and expectations are developed in conjunction with your Committee. Financial support is generally offered for five years, contingent upon adequate student progress and the availability of funds.

C. TIME-TO-DEGREE LIMITS

Graduate School legislation imposes a time limit on degree programs, counting from the date of the student's first registration in the program to the awarding of the degree: four years for the M.S. and seven years for the Ph.D. To request an extension, students may, with the approval of the field, petition the Graduate School.

The Graduate Fields of Atmospheric Sciences and Geological Sciences strongly encourages students to complete their degree in a timely manner.

V. THE SPECIAL COMMITTEE

The special committee, under the leadership of the chairperson, is responsible for overseeing the student's course of study and progress. Among other things, the special committee administers examinations, oversees the thesis, assures itself that the student is well prepared in his or her field, sees to it that all degree requirements have been satisfied, and recommends that the degree be awarded.

The special committee will also meet and set requirements tailored to individual student needs, typically including course work and other program goals. There are no regulations of the Graduate School governing the number of courses, grades, or specific content of

instruction to which special committees must subscribe, so the committee has a good deal of freedom to work with the student in establishing an appropriate program. Special committees may impose any requirements over and above the requirements of the Graduate School that they deem educationally sound. Also, students must remain in good standing and making satisfactory progress by both doing well in course work and making progress in research toward the thesis, as discussed in Section IX below.

The Graduate Fields of Atmospheric Sciences and Geological Sciences (and the Graduate School) considers regular meetings between the student and his or her special committee important to ensure proper communication and urges the student to take the initiative in holding such meetings at least twice a year. These meetings may take the form of individual meetings with each advisor or a group meeting of the entire committee; most students also meet much more regularly with their advisor. Remote participation is acceptable. It is recommended that students be proactive to set up such meetings regularly, for example at the start of each semester. Students will report these meetings on annual self-evaluation.

The Chair is the most important member of a special committee, and typically is the research advisor. It is important to maintain a good working relationship with the Chair, as they will be more heavily invested in your success than anybody else, and will put a tremendous amount of time, thought and energy into your education. They will be working hard to secure resources needed for your research and support during your time in the program, and will be helping you professionally for a long time, writing recommendation letters and related activities. They are also the primary person evaluating your progress and success in the program. For these reasons, it is important that you have in-depth discussions with your advisor about expectations and commitments early in your program. The relationship is voluntary on both ends, in the sense that you have some leeway to switch advisors, and the Chair or any committee member can resign in which case you have to select a new chair; see Section C below. Either of these options is complicated, so a best first step will be to work out any issues as best you can. You can find information on where you go if you encounter problems in Section XII below.

A. SELECTION

An M.S. student is required to have at least two members on their special committee. For the Graduate Field of Geological Sciences the special committee includes a chairperson representing a concentration within the Graduate Field of Geological Sciences, and a minor member representing either an additional concentration within the Graduate Field of Geological Sciences or a concentration in an additional subject outside the Graduate Field of Geological Sciences. In the Graduate Field of Atmospheric Sciences, the special committee includes a chairperson representing a concentration within the Graduate Field of Atmospheric Sciences, and a minor member representing a subject and concentration outside the Graduate Field of Atmospheric Sciences. In most situations it is beneficial to have committee members besides the advisor who have expertise in your thesis topic, so you may have more than two committee members. It is recommended that an additional member or members be added when the minor member will not provide that expertise.

A Ph.D. student in the Graduate Field of Atmospheric Sciences is required to have at least four members on his or her special committee: a chairperson representing a concentration within the Graduate Field of Atmospheric Sciences, and two minor members who each represent a concentration in an additional subject outside the Graduate Field of Atmospheric Sciences. Additional members may be added to the special committee of Ph.D. students to cover other areas of interest.

A Ph.D. student in the Graduate Field of Geological Sciences should have at least four members on their special committee. Three are mandated by the Graduate School: a chairperson representing a concentration within the Graduate Field of Geological Sciences, a minor member representing a subject and concentration outside the Graduate Field of Geological Sciences, and a minor member who may represent either an additional concentration within the Graduate Field of Geological Sciences or a concentration in an additional subject outside the Graduate Field of Geological Sciences. The fourth member can be in any discipline, but in most situations it is beneficial to have committee members besides the advisor who have expertise in your thesis topic. Additional members should be added in the common case where neither of the minor members will provide that expertise. The full 4-person committee must be formed prior to the A exam, but not necessarily before the Q exam (see below).

All members of the special committee may impose requirements above and beyond what is required in this document or by the graduate school. It is good to discuss what requirements a member might impose before adding them to your committee. Quoting from the Code of Legislation of the Graduate Faculty (<https://gradschool.cornell.edu/policies/code-of-legislation/>): “The special committee member who represents an approved subject or concentration on a special committee determines the specific requirements for the student.”

All members will participate in the A and B exams, while generally a subset of the committee or a temporary committee will participate in the Q exam (see Section VI). Students may structure participation in regular advising meetings such that only in-field members participate or all members participate, as needed.

As stated in the Code of Legislation “The Director of Graduate Studies must endorse the proposed special committee membership prior to Graduate School approval or must convey objections to the Dean of the Graduate School.” The DGS may object if the proposed special committee chair does not meet the following criteria established in the EAS “Guidelines for TA allocation”: “To admit a new student (or otherwise become chair of the student’s special committee), faculty need to have funding in hand to support the student, prospects for funding for the new student, or have authorization from the graduate field admission committee in consultation with the EAS chair, EAS administrative manager, or DGS before accepting a student without funding prospects.”

Note that EAS faculty are members of multiple Graduate Fields and can serve on your committee as an external member if they represent a field that you are not a member of.

Larry Brown: Archaeology; Physics; Sustainable Energy (minor)

Lou Derry: Sustainable Energy (minor)
Esteban Gazel: Astronomy & Space Sciences
Dave Hysell: Astronomy & Space Sciences; Electrical & Computer Engineering
Teresa Jordan: Latin American Studies (minor); Sustainable Energy (minor)
Natalie Mahowald: Civil & Environmental Engineering; Physics; Mechanical Engineering
Matt Pritchard: Astronomy & Space Sciences
Susan Riha: Soil and Crop Sciences; Water Resources (minor)
Sara Pryor: Computational Science and Engineering (minor)
Britney Schmidt: Astronomy & Space Sciences

Also, several faculty are members of both Graduate Fields in EAS: Geological Sciences and Atmospheric Sciences (see Section II for list).

B. TEMPORARY COMMITTEE

A temporary committee will be established for all first-year students in both Graduate Fields upon arrival to provide guidance and multiple points of contact through the student's first year. It will be replaced by the permanent committee as the permanent committee is appointed. The temporary committee includes the special committee chair (advisor) and 1-2 additional members. Each first-year student should meet regularly with this committee to identify important courses; generally, one meeting should be near the start of classes each semester. By default, the DGS will be a member of this committee, although in many cases more suitable alternatives can be found. Students will report this committee composition and meeting in their annual self-evaluation.

C. DEADLINES

A student must submit the name of their special committee chair or temporary advisor to the Graduate School no later than three weeks after first registration.

M.S. students must select their full committee as defined by the Graduate School (chairperson, minor member) by the end of their second semester.

Ph.D. students must select their full committee as defined by the Graduate School (chairperson, two minor members) no later the end of their third semester. The fourth committee member must be added prior to the A Exam.

The timeline to submit the M.S. and Ph.D. theses for approval in advance of the three conferral deadlines (May, August, and December) is available from the grad school: <https://gradschool.cornell.edu/academic-progress/thesis-dissertation/writing-your-thesis-dissertation/understanding-deadlines-and-requirements/> In brief, you need to submit a draft of your thesis to your committee six weeks in advance of your exam. Then revise your thesis, get it approved by your committee, and submit the final version of the thesis by the date posted by the grad school (and within 60 days of the thesis exam).

D. CHANGES TO MEMBERSHIP

A student may change their special committee with the approval of all the members of the newly constituted committee. Notice of such change must be filed immediately with the Graduate School.

For M.S. students, no change may be made during the three months prior to the Final Examination, except with the approval of the Dean.

For Ph.D. students, no change may be made after passing the A Exam, except with the approval of the Dean. In addition, no Ph.D. student may schedule a B Exam within three months of a change of committee, except with the approval of the Dean.

Any Special Committee member may resign, including the chair, except when students are on approved Health Leave of Absence status. The student must replace the member who resigned. A chair must generally be replaced within one semester for a student to continue to register, and financial support is not guaranteed while the chair is absent.

E. AD HOC MEMBERS

Although members of a student's special committee are normally drawn from the currently active graduate faculty at Cornell University, committee members from outside that body (ad hoc members) may be added under special circumstances. Such a member should either have special expertise in the student's subject area, or should have a close working association with the student and his or her research. An example would be a faculty member at another institution with whom the student is working or who has expertise in the student's sub-specialty.

To be nominated, the individual must be recommended for ad hoc membership by the Director of Graduate Studies. The individual's curriculum vitae and the student's petition requesting the ad hoc member, including the signature of the Director of Graduate Studies, must be submitted to the Dean of the Graduate School for final approval. The student and advisor can work with the Department and Director to generate this request.

Ad hoc special committee members can fill the role of the third member for M.S. committees, or fourth member of Ph.D. committees. The Graduate School mandates that two members of an M.S. committee or three members of a Ph.D. committee are members of the graduate faculty and are not ad hoc members; see the Code of Legislation for details.

VI. EXAMINATIONS

For M.S. students, the graduate faculty requires the Final Examination for the Master's Degree. For Ph.D. students, the graduate faculty requires the Examination for Admission to Candidacy (A Exam) and the Final Examination for the Doctor of Philosophy Degree (B Exam). The Graduate Field of Geological Sciences further requires Ph.D. students to take a

Qualifying Examination (Q Exam). In general, all examinations take place on campus and with the full Committee present, so be sure to schedule them well in advance as your committee can be very busy (remote participation or some substitution is possible in special circumstances; see Code of Legislation).

A. QUALIFYING EXAMINATION (Q EXAM)

The Atmospheric Science Field does not require a Qualifying (Q) exam for Ph.D. students, but the Graduate Field of Geological Sciences does (see below for details). **In lieu of a formal Q exam, Ph.D. students in Atmospheric Sciences are expected to meet with their special (or temporary) committee before the start of the third semester. The goal of this meeting is to review the student's research progress, general knowledge in the appropriate fields of study, and recommend a plan for coursework in future semesters to ensure that the student has sufficient expertise to complete graduate study. At the end of this meeting, the Chair of the student's committee will submit a short summary of the recommendations (e.g., classes to take or TA, seminars or conferences to attend or present at, etc.) to the student, committee, DGS, and GFA. These recommendations will be re-visited during the A-exam. After this meeting with the special/temporary committee, but before the end of the third semester, the full Special Committee must be constituted as described in Section V above.**

The Q Exam is intended to determine a Ph.D. student's aptitude for advanced study and scientific research and will evaluate any gaps in the student's preparation. It enables the examination committee to propose a program that will help the student accomplish his or her objectives. The Q exam can be held before the full Special Committee is set. The examination is administered by a three-person committee chaired by the Special Committee chair and usually including a subset of the planned Special Committee, generally members who are on campus and close to the student's area of study. The committee can be constituted either through appointing members to the Special Committee – a partial 3-person committee can be constituted with in-field members – or temporary members can be appointed for the purpose of this exam with permission of the Director of Graduate Studies. Attendance is generally limited to that examining body. The exam format includes a written component in the form of a four-page research proposal (single spaced and not counting figures and references), and a short 15-minute oral presentation discussing plans for research and coursework. The written component should be submitted to committee members at least two weeks before the date of the exam

The scope of the exam should include a broad understanding of the field as appropriate for the area of specialty. Across the field, material in introductory courses (e.g., EAS 2250) and second courses is appropriate. In the student's sub-discipline, more extensive questioning at the level of existing graduate-level coursework is likely. All students are recommended to talk with their advisor and special committee members at least one month prior to the exam about their expectations for the exam and possible outcomes.

The student must arrange the examination date and location in consultation with the members of his or her exam committee. No formal scheduling with the graduate school or department is required.

For a student to pass a Q Exam, all regular, proxy, and field-appointed members of the examining committee must approve. If a student passes an examination conditionally, the conditions must be provided to the student in writing on the “Results from Q Exam” form.

If the student fails a Q Exam, re-examination is allowed only with the special committee’s approval and then, not until at least three months have elapsed since the failed exam. The possibility of re-examination will be described on the “Results from Q Exam” form. If there is a second Q exam, the special committee will be the same as in the first exam. The committee can also recommend that the student switch from the Ph.D. to M.S. program and provide a deadline for completing the M.S. degree.

The committee Chairperson must complete and send the “Results of Q Exam” form to the Graduate Programs Coordinator, copying all members of the committee, the student, and the Director of Graduate Studies. The Q exam reporting form includes recommendations for the student (e.g., classes to take or TA, seminars or conferences to attend or present at, etc.), that will be re-visited during the A-exam. Also, the student reports the exam date and outcome on their annual review.

It is recommended that the Qualifying Examination be taken before starting the third semester and must be taken by the end of the third semester. Since a major purpose is to determine what coursework a student should take, the earlier the exam is held the more it is useful. The Q exam may be a useful time to discuss membership for a full special committee.

After a successful Q Exam but before the end of the third semester, the full Special Committee must be constituted as described in Section V above.

B. ADMISSION TO CANDIDACY EXAMINATION (A EXAM)

The purpose of the A Exam is to certify that the student is sufficiently prepared to undertake thesis research. The A Exam may be taken after the student has completed two semesters of successful full-time study and, unless special permission is obtained from the Dean, must be attempted before the beginning of the student’s seventh semester of registration in the Ph.D. program. The successful completion of the exam implies that formal coursework is nearly or fully complete. The format of the A-exam is slightly different in the Graduate Fields of Atmospheric Sciences and Geological Sciences (described below). But for both Graduate Fields, the determination of the outcome of the examination rests exclusively with the Special Committee. The Special Committee may pass, conditionally pass, or fail a student. For a student to pass an examination, all members of the Special Committee must approve. If a student fails the examination, reexamination is allowed only upon approval of the Special Committee, but not earlier than three months after the failed exam.

In the Graduate Field of Atmospheric Sciences, the exam format—which can be written, oral, or both—typically includes both oral and written parts. This exam is sometimes considered a thesis proposal defense. The oral section of the examination must be scheduled with the Graduate School and must also be announced to the faculty in the Graduate Field by the DGS

at least seven days in advance of the examination. There can be a public presentation, describing the thesis proposal and/or work completed so far, which might last 30 minutes, to which the graduate students in the field, graduate field members and other people can be invited. After the public presentation, there is a closed session that ordinarily only members of the Special Committee attend and question the student, but other graduate faculty members are welcome to attend and are permitted to question the student.

In the Graduate Field of Geological Sciences, the exam format includes both oral and written components, as well as questioning. The exact format of the written component is to be decided by the special committee, but the purpose of the written component is to demonstrate that the student's abilities at technical and scientific writing. Some possible formats for the written component include: i) a research paper written by the student (with possible co-authors) that is either submitted or nearly submitted to a peer-reviewed journal; or ii) a research proposal that may include a progress report. The written section length should be approximately 10 pages single-spaced, not including figures or references and should be submitted to committee members at least two weeks before the date of the exam. The oral section of the examination generally begins with a 15-25 minute research progress report followed by ample time for questioning by the committee. All students are recommended to talk with their advisor and special committee members at least one month prior to the exam about what their expectations for the exam.

The oral exam must be scheduled with the Graduate School and must also be announced to the faculty in the Graduate Field of Geological Sciences by the Director of Graduate Studies at least seven days in advance of the examination. Students should schedule contiguous three hours for this examination in coordination with schedules of all committee members, although many A exams require less time. Ordinarily only members of the Special Committee attend and question the student, but other graduate faculty members are welcome to attend and are permitted to question the student.

C. FINAL EXAMINATION FOR THE DOCTOR OF PHILOSOPHY DEGREE (B EXAM; THESIS DEFENSE)

A doctoral candidate takes the B Exam, also known as the thesis defense, upon completion of all requirements for the degree but no earlier than one month before completion of the minimum number of registered semesters. Furthermore, a minimum of two semesters of successful full-time study must be completed between passing the A Exam and scheduling the B Exam. The examination must be scheduled with the Graduate School and must also be publicly announced by the Director of Graduate Studies or the field administrator at least seven days in advance of the examination. This oral exam covers the general subject of the dissertation and, in both the Graduate Fields of Atmospheric Sciences and Geological Sciences, takes the form of a public thesis defense with open questioning, followed by private questioning by the Special Committee. A doctoral candidate must submit a complete draft of their thesis to all members of their Special Committee at least six weeks before the B Exam, unless the requirement is modified by the Special Committee. At least five business days before the B Exam, a student must also give each member of the Special Committee the thesis, complete in all respects and editorially acceptable for final approval. The thesis,

following any revisions after the B Exam, must be submitted to the Graduate School within 60 days of the B Exam, and must receive final approval from the Graduate School (for formatting purposes) and all members of the Special Committee.

D. FINAL EXAMINATION FOR THE MASTER'S DEGREE

An M.S. student takes the final examination upon completion of all requirements for the degree but no earlier than one month before completion of the minimum registration requirement. The examination must be scheduled with the Graduate School and must also be publicly announced by the Director of Graduate Studies at least seven days in advance of the examination. This oral examination covers the topic of the master's thesis and, in both the Graduate Fields of Atmospheric Sciences and Geological Sciences, takes the format of a public thesis defense with open questioning, followed by private questioning by the Special Committee. For a student to pass an examination, all members must approve. If a student fails the examination, reexamination is allowed upon approval by the Special Committee but not earlier than three months after the failed exam. An M.S. student must submit a complete draft of their thesis to all members of their Special Committee at least six weeks before the Final Examination, unless the requirement is modified by the Special Committee. At least five business days before the Final Examination, a student must also give each member of the Special Committee the thesis, complete in all respects and editorially acceptable for final approval. The thesis, following any revisions after the Final Examination, must be submitted to the Graduate School within 60 days of the Final Examination, and must receive final approval from the Graduate School (for formatting purposes) and all members of the Special Committee.

VII. ORIENTATION AND FIRST-SEMESTER COURSE

All new students should participate in orientation meetings held by the Graduate School, and the short orientation session within the Field – these sessions are usually held before classes begin or during the first week of classes. The purpose of the Field session is to provide an overview of the field and the Cornell system, to start to get to know your peers and faculty, and to have a first chance to ask questions about this handbook or any other aspect of graduate student life.

All first-year students should take a one-credit fall and spring-semester course in EAS (6920 “How to be a successful Graduate Student”), designed to introduce Geological Sciences and Atmospheric Sciences students to the department and to acclimatize students to graduate life. The course has a different topic each week: introduction to campus resources available (for example professional development and mental health); discussions of ethical and practical issues as a student in science; how to be a good mentor/mentee; creation of an individual development plan; what it is like to be an international student; how to write a paper and complete peer review; how to give a successful presentation; and a proposal writing element where students get training and feedback to write an NSF-style graduate fellowship proposal.

VIII. COURSEWORK

The Graduate School has no specific requirements related to the number of or level of courses that students must complete in order to obtain the M.S. or Ph.D. degree. Instead, the Special Committee determines which courses the student must complete. Also, satisfactory progress must be maintained, described in the next section. In the Graduate Fields of Atmospheric Sciences and Geological Sciences, students typically take 2-3 courses related to their major program each term during their first couple of years. Additionally, students often need to complete coursework in order to fulfill requirements related to their minor concentration(s). The faculty member on the Special Committee representing the minor concentration determines which courses the student must take in order to fulfill the minor.

M.S. and Ph.D. students are required to enroll in at least 12 credits each term. If students are taking fewer than 12 credits of coursework or are no longer completing coursework, they will be automatically enrolled in an appropriate research course (i.e. GRAD 9012 Master's Thesis Research, GRAD 9010 Graduate-Level Research, or GRAD 9011 Doctoral Dissertation Research) by the Graduate School for the remaining number of credits that they need.

IX. REVIEWS, MENTORING, AND PROGRESS

A. ANNUAL STUDENT PROGRESS REVIEWS

Each year, toward the end of the spring semester, both Graduate Fields conduct a review of all students. Each student fills out the Student Progress Review (SPR). The Graduate School provides a web-based SPR system for writing, disseminating and archiving these reports. These are due annually before the end of spring semester, at a date announced mid-semester. This review gives you a chance to reflect on your progress, identify goals for the coming year, and provide feedback to your advisor and committee. Once you complete the SPR, schedule a meeting to discuss it with your advisor(s). Your advisor(s) will provide constructive written feedback, offer encouragement, or signal if there are any areas in need of improvement. These are a basis for annual reviews within the field, where they become one opportunity for evaluating satisfactory progress. Students should include information about committee meetings in this report.

B. MENTORING PROGRAMS AND TOOLS

The EAS Department has several programs to enhance mentoring and professional development of graduate students that complement regular meetings with your advisor and special committee, the EAS 6920 class, and other activities. Mentoring is important to you as a graduate student not only because of the knowledge and skills that are shared, but also because of the many other aspects of professional socialization and personal support that are needed to facilitate success in graduate school and beyond. You should have multiple mentors who can help you develop in different ways. Here is a brief introduction to some of the EAS mentoring activities:

Peer mentoring: Starting in Fall, 2020, students met with peer mentors (senior graduate students) several times during the weekly meetings of EAS 6920. This program was endorsed by the participants and so we plan to continue. There are several other peer mentoring programs at Cornell outside of EAS like CUEmpower:
<https://www.engineering.cornell.edu/engdiversity/current-students/peer-mentoring>

Shared Expectation Agreements (SEAs): Starting in Fall, 2020, in an effort to improve communication between students and advisors, we asked all incoming students to complete a worksheet of questions with their new advisors and revisit them at least annually.

Part I (September of first year): At this [link](https://drive.google.com/file/d/1AQ3-PmpMz4w0WP3KJ11Y0UW0sXaATNus/view?usp=sharing) (https://drive.google.com/file/d/1AQ3-PmpMz4w0WP3KJ11Y0UW0sXaATNus/view?usp=sharing) you will find a list of suggested questions that should help you develop a concrete set of expectations for your first year. Within your first few weeks on campus, please set up a meeting with your faculty advisors to ask these questions to them or discuss how the list of questions should be modified to better match the expectations of your field. As you do, please also write down their responses.

It should take about an hour to complete this questionnaire with your advisor. That might be a bit too much time to do in one setting, so you might want to schedule two 30 min. meetings to make sure you get through it all. Or, you might spend a few minutes over the course of a month answering a handful of questions at a time in addition to discussing your projects, research, or coursework. To facilitate this, we have tried to arrange the order of the questions so that the issues you will either encounter first, or that might be most critical, appear earliest in the document. However, you should do what is most comfortable for you and feasible with you and your advisor's schedules.

Part II (October/November of first year): When you have completed that step, you will then be in an excellent position to write up a SEA that you can share with your faculty advisor and the Director of Graduate Studies (DGS; examples will be provided later in the semester). These agreements should reflect your understanding of your advisor's expectations for your work and commitments to your education, and they are envisioned to establish clear expectations between you and your advisor. Further, they will serve as an agreement of mutual understanding of accountability for your research and your progress towards your degree.

Part III (Following Spring of first year): Conversations about expectations should continue as you progress -- this is not a one-time conversation. Please plan to revisit these questions each year, and as needed!

Individual Development Plans (IDPs) are designed to help graduate students set academic goals, develop professional skills, explore career opportunities, and conduct long-term career planning. IDPs are composed of a set of questions students to aid in self-reflection that the student answers annually with the questions changing as the student progresses through the graduate program. IDPs are common in many areas of science (for example they are required of those funded by the National Institutes of Health), but are underutilized in the

geosciences (Eason et al. 2020; GSA Today, <https://doi.org/10.1130/GSATG3GW.1>). Students are encouraged to fill out IDPs during a session of EAS 6920 and are welcome to share answers to the questions with their advisor, mentor, or others or simply keep the answers to themselves for their own personal use. Information from the IDPs could be useful in the SPRs (see section IX.A.) but EAS students recommend doing both because IDPs ask more focused and detailed questions than the SPRs. Starting in Spring 2020, we have asked first year EAS students to fill out the IDPs from Stanford Biosciences ([link: https://drive.google.com/file/d/1ANYiBWJwPzJ_O3KSc7UsAVayyTEID76x/view?usp=sharing](https://drive.google.com/file/d/1ANYiBWJwPzJ_O3KSc7UsAVayyTEID76x/view?usp=sharing))

C. GUIDELINES FOR SATISFACTORY PROGRESS

M.S. and Ph.D. students are expected to maintain a B (3.0) or better grade point average. Grades of C+ to D-, while passing, do not normally constitute satisfactory progress. Satisfactory progress also requires following the Field and Graduate School schedule for setting committees and taking examinations, excepting cases where petitions for extension are approved. Satisfactory progress will be continually evaluated by the Special Committee Chairperson in coordination with the Director of Graduate Studies, as coursework and examinations are completed. In addition to coursework, each student will be broadly assessed through a variety of metrics, such as making regular public presentations of research results, submission of papers to peer reviewed literature, participating in the writing of proposals (either internal or external), and participation in departmental and group seminars. It is expected that students make progress in research each semester, with expectations varying depending on the situation – it is important that students discuss expectations on a regular basis with their advisor and committee.

X. STUDENT STATUS

A. REGISTERED STATUS

University registration is the official recognition of a student's relationship with the university and is the basic authorization for a student's access to campus resources. To become registered each term, a student must settle all financial accounts with the university, satisfy New York State and university health requirements, and have no holds from their college, the Office of the Judicial Administrator, Health Services, or the Bursar.

i. FULL-TIME STUDY

An individual is considered a full-time student if he or she is registered, enrolled in courses or engaged in thesis work, and is in conformity with limitations on assistantships, hourly student appointments, and/or outside employment as specified in the Code of Legislation of the Graduate Faculty.

ii. IN ABSENTIA STUDY

In absentia status provides an opportunity for graduate students to engage in approved study during the academic year in a location at least 100 miles away from campus while continuing to work under the guidance of the Special Committee. An extended field season that overlaps a significant part of the semester is a valid reason for applying for in absentia status. A student may apply for in absentia status by submitting a petition to the Graduate School. An M.S. student must have completed at least one semester of registration and a Ph.D. student must have completed at least two semesters of registration in full-time study on the Ithaca campus or at a satellite location to be eligible for in absentia status. Graduate students who are approved to register in absentia pay in absentia tuition (currently \$200/semester) instead of regular tuition.

B. NON-REGISTERED STATUS

i. LEAVE OF ABSENCE

A leave of absence can be granted for personal or health reasons. Leaves run for a period of up to 12 months and may be renewed annually to a maximum of four calendar years. Time spent on leave of absence does not count toward time-to-degree limits. The field and the Graduate School jointly determine whether a personal Leave of Absence will be granted. If a Health Leave of Absence is recommended for a student by University Health Services, the Graduate School, in consultation with the field, determines whether a Health Leave of Absence will be granted. A student who takes a leave of absence relinquishes access to campus facilities and services that normally accompany student status. Special considerations apply to students holding a non-immigrant visa who wish to take a leave; it is crucial that an international student taking a leave of absence discusses their plans with the Graduate School and International Services within the Office of Global Learning before leaving Cornell.

ii. WITHDRAWAL

Students may withdraw voluntarily at any time. Withdrawal is appropriate for students who do not intend to resume studies or to complete their M.S. or Ph.D. at Cornell University. Any interruption of registration is considered a withdrawal unless the student has been granted a leave of absence.

XI. CHANGES IN PROGRAM

An M.S. student wishing to change to the Ph.D. program, who has the endorsement of his or her Special Committee Chairperson to do so, should submit the Application for Student Program Change form to the appropriate Graduate Programs Coordinator for the Graduate Field (either Atmospheric Sciences or Geological Sciences) for consideration by the field.

As part of the consideration process, the Director of Graduate Studies will consult with the Special Committee Chairperson and other members of the student's Special Committee. If approved, the Application for Student Program change form will be forwarded, along with an admit letter, to the Graduate School and the student will be officially changed to the Ph.D. program.

A Ph.D. student may elect to change to the M.S. program by submitting an Application for Student Program Change form to the appropriate Graduate Programs Coordinator for the Graduate Field (either Atmospheric Sciences or Geological Sciences). A student's Special Committee may also recommend that the student change from the Ph.D. program to the M.S. program at any time (for a variety of reasons), and can decide to allow such a change as an alternative to failing an exam. If such an action is taken, the Special Committee must inform the Graduate School, the appropriate Director of Graduate Studies for the Graduate Field (either Atmospheric Sciences or Geological Sciences), and the Graduate Programs Coordinator.

XII. RESOURCES AND SUPPORT

There are many resources for financial, academic, and non-academic assistance at Cornell. Below we point you to some additional resources and also encourage you to consult with the [“EAS Grad Students Guide”](#) written by EAS graduate students:
<https://docs.google.com/document/d/1YL27VXj6M2l4FZefxPQvhikN5oOh-iMBj6ew4gxq1zE/edit#heading=h.gjzr1hmvfel5>

This handbook does not discuss financial aid, which often takes the form of Teaching Assistantships, Graduate Research Assistantships, or Fellowships. These are usually arranged through the department, advisor, or fellowship sponsor and are described in your offer letter upon admission and/or in the appointment letter you receive each semester or for the summer. Note that summer support is usually not guaranteed and so you should discuss the options for summer support as soon as possible with your advisor. Details about the responsibilities associated with these positions are described in the Code of Legislation of the Graduate Faculty (<https://gradschool.cornell.edu/policies/code-of-legislation/>) and Cornell University Policy 1.3: Graduate Student Assistantships (http://www.dfa.cornell.edu/sites/default/files/policy/vol1_3.pdf).

For any academic issues, your advisor and Special Committee are the natural first place to turn. Advisors can be surprisingly helpful and understanding, and the rest of the Committee can be very valuable for providing other perspectives. The Director of Graduate Studies and the Student Programs Coordinator are always available as well, including in situations where you may not want to approach your advisor. You should feel free to approach any faculty in EAS about other concerns, including the Department Chair. Finally, should those avenues not work for you, the Graduate School has a variety of people devoted to student academic support, depending on the nature of concerns. You should be aware that in many situations,

there will be communication between advisor, DGS, and Graduate School regardless of who you approach and usually it is best to start with your advisor.

Throughout your time at Cornell, you should find workshops that will aid in your professional development to learn skills that will help you become more successful in whatever career you pursue. First-year students should enroll in the year-long series of workshops for professional development as EAS 6920 – learn how to write a scientific paper or proposal, how to give and receive mentoring, time management, etc. This class is open to all graduate students. As a first-year student, check out the series of seminars offered by the graduate school about making the transition to graduate school: <http://gradschool.cornell.edu/transitions>. The graduate school offers many other workshops: <https://gradschool.cornell.edu/student-experience/student-life-programs/>. To improve your teaching abilities there are workshops through the Center for Teaching Innovation: <https://teaching.cornell.edu>. Cornell Career services offers a range of opportunities to provide advice on advancing your skills and career: <https://www.career.cornell.edu/students/grad/>.

The graduate school has a page listing student perks and discounts, including information on fitness and wellness, emergency funds, transportation, computing, etc.: <https://gradschool.cornell.edu/student-experience/student-perks-and-discounts/>

Cornell also provides excellent support for a wide variety of non-academic issues which affect graduate students. The Office of Student Life at the Graduate School is a source of support and advocacy for graduate students and also serves as a coordinating hub of services that facilitate the student life experience at Cornell. You can find additional information on the Office of Graduate Student Life at <http://gradschool.cornell.edu/life-cornell/office-student-life>.

You can find additional information on resources for graduate students, both academic and non-academic, especially for mental health support at <http://gradschool.cornell.edu/student-life/help-and-support>.

As a member of the Cornell community, we encourage you to familiarize yourself with the Campus Code of Conduct: <https://www.dfa.cornell.edu/sites/default/files/policy/CCC.pdf> and the policy on Prohibited Bias, Discrimination, Harassment, and Sexual and Related Misconduct through Cornell University Policy 6.4: https://www.dfa.cornell.edu/sites/default/files/vol6_4.pdf

Anyone who directly witnesses or experiences bias activity (or finds evidence of or hears about past bias activity) on the Cornell campus or in an area that impacts the Cornell community should intervene in the moment as appropriate (e.g., contact [Campus Police](#) at 911, if a crime is in progress, or interrupt the behavior in as much as the observer feels skilled and safe). A report of the incident should be made as soon as possible: <https://diversity.cornell.edu/our-commitments/bias-reporting-cornell>

There are many opportunities to meet other students in our program and across campus. The department hosts regular social events (fall welcome party, winter holiday party, etc.) and other events are organized by graduate students (like Snee Tea). Also, the Snee Graduate

Organization offers regular meeting and events to meet students in the department. A list of clubs and organizations available for graduate students is available here: <https://gradschool.cornell.edu/diversity-inclusion/student-organizations/>

The department maintains an internal webpage (intranet) with some additional information about travel reimbursement and travel leave (special forms are required for international travel), travel funds, policies for safe and respectful behavior for off-campus activities, and more: <https://www.eas.cornell.edu/eas/intranet-eas>. The most recent version of this handbook will be posted there, but please keep a copy of the version you received upon arrival, because this is the version you will follow during your time at Cornell.

Every year, the department seeks nominations (including self-nominations) for outstanding graduate student awards. The exact details vary a little from year to year, so look for details to come out via email each April. The Bryan Isacks Excellence in Teaching Award was established in 2007 by the late Timothy Gubbels (Ph.D.'93 Geological Sciences) in honor of Professor Bryan Isacks to recognize a graduate student who is highly effective as a teaching assistant and who possesses the following characteristics: 1) is collaborative; 2) has expeditionary zeal; 3) has moxie (definition: energy, pep, courage, determination, know-how); 4) has brio (definition: enthusiastic vigor, vivacity, verve). The Estwing award is given to the student nominated as the “most outstanding graduate student and The Estwing Company provides the winner with an Estwing Rock Pick which is engraved with the recipient’s name. The Meyer Bender ’29 and Stephen Bender ’58 Memorial Scholarship in Geological Sciences is awarded based on nominations given the following two criteria: 1. “Dedication to academia – to strive toward the highest of academic honors in Graduate Geology.” Both the quality and the diversity of the nominee’s academic record will be considered. 2. “Dedication to the human aspects of life – to communicate with ones fellow [human] with sharpness of mind; succinctly; with clarity; yet sensitive to human needs.” Qualities of leadership, service to the department, community, university and to fellow students in all forms will be taken into account.

XIII. AT A GLANCE

A. M.S.

- **Type of Degree:** Research
- **Duration:** At least two semesters of registration; typically two years
- **Special Committee:** Minimum of two-member committee consisting of chair and one minor member; additional member(s) are encouraged.
- **Required Examinations:** Final Examination for the Master’s Degree
- **Deadlines:**
 - Chair Nomination—3rd week of 1st semester
 - Special Committee Selection—end of 2nd semester

- Master's Examination and Thesis Submission—as soon as degree requirements have been met; no later than 8 semesters

B. PH.D.

- **Type of Degree:** Research
- **Duration:** At least six semesters of registration; typically five years
- **Areas of Concentration:**
 - Atmospheric Sciences: Three areas, one from within the graduate field
Two from outside the graduate field
 - Geological Sciences: Three areas, one from within the Graduate Field of Geological Sciences, one from outside the Graduate Field of Geological Sciences, and either from within or outside the Graduate Field of Geological Sciences.
- **Special Committee:** A minimum of a four-member committee consisting of chair, an additional member of candidate's choosing, and two minor members. A minimum of four members ensures adequate expertise of the thesis topic. All minor members need not be selected until after passing the Q exam.
- **Required Examinations:** Geological Sciences: Qualifying Examination (Q Exam);
Both Atmospheric and Geological Sciences: Admission to Candidacy (A Exam);
Final Examination for Doctor of Philosophy Degree (B Exam)
- **Deadlines:**
 - Chair Formal Nomination—3rd week of 1st semester
 - Temporary Committee (assigned by DGS): 1st week of 1st semester
 - Regular committee meetings: once per semester
 - **Atmospheric Sciences: Meet with Special or Temporal Committee to recommend classes to DGS/GFA before start of 3rd semester and no later than end of 3rd semester**
 - **Geological Sciences: Qualifying Examination—strongly encouraged before start of 3rd semester and no later than end of 3rd semester**
 - Special Committee Selection—end of 3rd semester (4th member before A Exam)
 - Admission to Candidacy Examination—before beginning 7th semester
 - Final Examination for Doctor of Philosophy Degree and Thesis Submission—as soon as degree requirements have been met; no later than 14 semesters