

EES Graduate Handbook, Part I. Curriculum and Program Policies

Earth & Environmental Sciences (EES), Lehigh University

Approved by the EES faculty 1 May, 2018.

version 2018_v1

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SECTION 1. INTRODUCTION: SOURCES OF INFORMATION

1.1 Overview, Graduate Curriculum and Program-Policies Handbook

This handbook is a guide to the graduate curriculum in the Department of Earth and Environmental Sciences. This handbook also addresses policies related to financial aid, leaves of absence, and other formal policies pertaining to EES graduate degrees. For requirements and policies specifically internal to EES, this handbook is the document of record.

1.2 Other Sources of Curricular Information

There are certain University- and College-wide policies and degree requirements that also apply to graduate work in EES. Information about these can be found in the University catalog (<http://catalog.lehigh.edu/graduatestudyandresearch/>) and in the College of Arts and Sciences (CAS) Graduate Student Handbook (<https://cas.cas2.lehigh.edu/content/cas-graduate-student-handbook>).

1.3 Information About Other Policies, Procedures, and Opportunities

Other informal policies, procedures, expectations, and opportunities are relevant to graduate life in EES. A description of these can be found in the EES Procedures Graduate Handbook, available on the Course Site page named “[EES Graduate Program Info](#)” (EEGRADINFO). In addition, the University graduate-studies page (<http://www1.lehigh.edu/academics/graduate/>), and the web page of the Graduate Life Office (<https://gradlife.web.lehigh.edu/>) provide information and links to activities and resource of interest to graduate students. Finally, the EES web pages of the EES Department (www.ees.lehigh.edu) give current information about department faculty, staff, and students, its programs, and information about events and activities.

1.4 Changes and Updates

Lehigh University and the Department of Earth and Environmental Sciences reserve the right to change at any time the rules and regulations governing or otherwise affecting graduate students. In the event of formal program or curriculum changes, a student may adopt the revised curriculum or, to the extent it remains possible, retain the program to which they matriculated.

1.5 Graduate Program in the Context of the EES Department Mission

The graduate program in Earth and Environmental Sciences is a crucial part of our mission to conduct high-impact basic research and provide high-quality education to both undergraduate and graduate students. We aspire to have national and international impact in our fields and this includes the training and work of our graduate students. The EES mission is as follows:

We study the Earth and environment, how the solid earth, oceans, atmosphere, and life interact to shape the world in which we live. Our research is incorporated into field-based, experiential, multidisciplinary education and integrates observational, experimental, theoretical, and numerical approaches. We seek to instill in our

undergraduate and graduate students the critical thinking, quantitative, and communication skills needed to succeed in life. Engagement with diverse perspectives and people enhances our research and is integral to educating our students. We seek to enhance earth science literacy through academic and outreach activities so that individuals and communities can make informed decisions about land use, biodiversity, resources, hazards, and climate change.

1.6 Graduate Program Overview

The EES Department offers graduate programs leading to the M.S. and the Ph.D. in Earth and Environmental Sciences. Research is an integral component of both EES graduate programs and leads to an M.S. thesis or Ph.D. dissertation prepared under a research supervisory committee, which is chaired by a research advisor who is a member of the departmental faculty. An advising commitment by one or more faculty members is required for graduate admission. Graduate students may change advisors with the consent of the proposed advisors and the approval of the Graduate Instruction Committee (GIC).

The University has outlined the general academic requirements for M.S. and Ph.D. students. EES requirements are aligned with these but the department has additional requirements that must also be fulfilled. [It is the student's responsibility to ensure that all their graduation requirements are met.](#)

1.7 EES Graduate-Program Management

The EES graduate program is overseen by a faculty member who serves as Graduate Coordinator, and also acts as Chair of the GIC. The GIC oversees all departmental procedures relevant to graduate students and works with one of the departmental coordinators (currently Nancy Roman) to administer the program. The GIC also assesses graduate student progress, proposes new policies and changes to existing policies, and manages the admissions process. The departmental faculty as a whole have final approval over matters of degree requirements and policies.

SECTION 2. Ph.D. DEGREE REQUIREMENTS AND REGULATIONS

2.1 Coursework Requirements

All Ph.D. students in EES are required to take a minimum of six courses at the 400-level. One of these courses must be selected from the Department's three core courses: Tectonic Processes (EES 426), Paleoclimatology (EES 415), or Physical and Chemical Processes at the Earth's Surface (EES 411). Otherwise, course selection and the distribution of credit hours between dissertation credits and coursework credits are up to the student's committee. Depending on the results of the qualifying exam, the Department faculty may recommend particular courses in areas where they feel the student's preparation is deficient, but it is the supervisory committee that has final control of the student's program.

For Ph.D. students, EES courses that are below the 200-level do not count towards degree credit requirements. Courses from other departments must be at least at the 100-level in

order to be counted for graduate credit. This does not mean that enrollment in lower-level courses are disallowed. For example, the supervisory committee may require a student to take introductory or other lower-level courses that make up for deficiencies in the student's preparation, even though credit cannot be received for them.

Before passing the General Exam, Ph.D. students are limited to registering for no more than nine credits of Dissertation Research (EES 499).

Courses in which a Ph.D. student receives a grade lower than C- do not count towards the graduation requirement. If a student accumulates more than 12 credit hours of grades lower than B- (known informally as the 'Four-C Rule'), he or she will be barred from registration and dropped from the program by the University. Overall, the University requires a minimum cumulative grade point average of 2.75 for graduation with a graduate degree.

2.1.1. Credit Requirements. Aside from the specific course requirements just discussed, Ph.D. students must register and pay for a total of 48 credit hours if entering with an M.S. degree and 72 credit hours if entering with a B.A. or B.S. degree. All these credits do not have to be earned in formal coursework, and the total can include multiple registrations for dissertation research (EES 499).

2.2 Residence Requirement

The University's residence requirement stipulates that the Ph.D. student must complete either two semesters of full-time study, or 18 credit hours within a 12-month period, while in residence at Lehigh. The requirement is intended to encourage a period of concentrated study and intellectual association at Lehigh. This is typically not an issue for EES students.

2.3 Time Limit to Degree

In the case of a Ph.D. student entering with a B.A. or B.S. degree, the student has a maximum of ten years to complete the requirements for the degree. In EES, the expected time for completion, however, is four to five years. In the case of a Ph.D. student entering with a M.S. degree, the requirements for degree must be completed in seven years, with an expected time for completion of three to four years. Extensions past the maximum in either case may be requested by a petition to the University Graduate and Research Committee, but there is no guarantee that an extension will be granted. Note that these University-mandated time limits for completing the degree are separate from time limits on financial aid, which are substantially shorter (see Section 5.3.1).

2.4 Supervisory Committee

Each Ph.D. student must have a supervisory committee. The committee has two functions: (1) it serves as an advisory board for the student's thesis or dissertation research as well as advice about professional development, and (2) supervisory committee members serve as evaluators for the General Exam and for the dissertation defense. According to the CAS Graduate Student Handbook, the Ph.D. supervisory committee "...is responsible for assisting the student in formulating a course of study, satisfying specific departmental requirements, submitting a suitable dissertation proposal,

overseeing progress in research, and evaluating the completed dissertation”.

The committee should be formed as early as possible after a student and their advisor have settled on a general research problem. Generally speaking, a student should assemble a committee and have a meeting no later than the middle of the second semester. Students must meet with their committee at least once a year to keep them informed of research progress and to get input from them. Preferably students should meet with their committee more often than annually, and consider sending out additional progress reports or research news by e-mail.

Ph.D. committees consist of at least four members, one of whom must be the dissertation advisor. The advisor and two of the committee members must be on the EES faculty and voting members of the Lehigh Faculty. At least one member of the committee must be from outside the EES Department and hold a doctoral degree in a relevant field. Usual EES practice is to have the outside member be from outside the university. One of the committee members from the department (but not the chair) can be an adjunct professor, professor of practice, lecturer or research scientist, provided they hold the doctoral degree and are approved by the CAS Associate Dean of Graduate Studies. EES graduates are excluded from supervisory committees for five years following their graduation, regardless of their current position. The CAS Associate Dean of Graduate Studies and Research approves the Ph.D. committee composition on authority of the University Graduate Committee as part of the process of admission to candidacy (see Section 2.8, below).

2.5 Qualifying-Exam Rules and Procedures

The EES Department requires all entering Ph.D. students to pass a Qualifying Exam whose protocol and guidelines are described below.

2.5.1. Exam rationale: The qualifying exam is the first department-wide milestone in the doctoral program. The exam is intended to assess a student’s preparation and intellectual ability, particularly reasoning skills and quantitative ability. Passing the exam provides the advisor and research supervisory committee with an affirmation that the student is up to the challenge of a doctoral degree program.

2.5.2. Exam Timing: [Students entering the EES doctoral program must take the exam by the end of their first semester.](#) The exam will be given on one date per semester, between weeks 10 and 13, coordinated with the other students taking the exam in that semester.

2.5.3. Examining Committee Composition and Exam Structure: The examining committee for a given academic year will consist of two EES faculty members appointed by the department chair. One faculty member is designated as chair of the committee. If one of the members cannot fulfill the obligations of the committee, then the department chair appoints a substitute. The exam consists of two sections:

Common section: The examining committee solicits questions from the department faculty and considers this input in the design of a series of questions that assess whether a student has the skills to conduct research and understands scientific methodology. Particular skill areas could include quantitative analysis and interpretation of data, research design and methodology, formulating and testing

hypotheses, and technical writing. These questions are given to all students taking the exam in a particular semester, so they must be applicable to the complete range of research disciplines in the department, even when only one student may be taking the exam. These questions should not be designed to test spontaneous recall of facts, definitions, or disciplinary content.

Disciplinary Section: The student's advisor designs and submits a section to the committee for inclusion in the exam that probes how well the candidate understands fundamental disciplinary knowledge. The disciplinary-content section is given only to the advisor's student. These questions may test spontaneous recall of facts, definitions, or other disciplinary content.

A copy of the final draft of the exam is circulated for final approval by the faculty.

2.5.4. Exam Format: The exam is designed to be completed in a single day and can include up to an hour of break, with four hours allocated for the common section and two hours allocated for the disciplinary section. The student may not have access to resources such as other students, textbooks, notes, or the Internet during the exam, but may have access to word-processing and spreadsheet software.

The qualifying exam is primarily a written exercise. However, exams may also include an oral component, either to clarify written answers or to assess technical skills such as field or laboratory abilities. An oral component may be required either by the advisor or by the exam committee. If the oral component is to clarify written answers, both exam committee members and advisor must be present at the oral session. For oral components that assess technical skills necessary for a discipline, the advisor designs, coordinates, supervises, and grades the exercises.

2.5.5. Exam Scoring: All questions and all answers will be sent to all committee members, including the advisor, within two days of the exam date. Each of the exam committee members will score each common question as passed or not passed. The advisor will score the disciplinary section as passed or not passed. The results of this preliminary scoring must be communicated to the exam committee chair before the committee meeting.

2.5.6. Exam Outcome: The examining committee plus the advisor will meet as a group within one week after the scheduled exam to discuss and collectively review the student's performance. The committee must decide the outcome of the examination by majority vote. Possible outcomes include Pass, Fail with retake, or Fail. A failed exam will result in termination from the degree program at the end of the semester in which the exam was taken. A fail with retake requires the student to take a second qualifying exam in the following semester. For the retake exam, the student may be required to complete either the common section or the disciplinary section, or both sections. Possible outcomes of the retake exam can only include Pass or Fail.

The examining committee may postpone the exam decision by majority vote if an oral continuation of the examination is necessary to fairly evaluate the student. The continuance decision should be rendered within one week of the initial exam date and the exam continuation should occur within two weeks of the initial exam date, with a decision rendered within three weeks of the initial exam date.

A member of the examining committee will prepare the draft report of exam outcome, and circulate it for approval to the entire exam committee, including advisor. When the full committee and advisor are in agreement with the content of the letter it will be presented to the candidate and copied to the GIC for inclusion in the student's departmental file. The final letter should be agreed upon within one week of the committee reaching a decision on the exam outcome.

2.6 Professional-Development Requirement

The purpose of this requirement is to engage the Ph.D. candidate and their committee in planning a program for gaining professional-development skills and experiences that will help the student achieve their career goals and enjoy a career that makes use of their academic training. The final Professional Development Portfolio (PDP) should reflect a sustained, substantial, and coherent effort that addresses multiple activities and experiences. There is no fixed formula for what constitutes an acceptable PDP because the career goals and interests of candidates will vary. The appended list of activities and experiences is meant to provide examples but other items can certainly be included subject to approval by the candidate's dissertation committee and the GIC.

2.6.1. Process and Time Line:

1. The candidate writes a realistic and brief plan describing the activities and experiences that would accumulate to become their PDP. This should be rationalized in the context of career and professional goals, and include a preliminary timeline. The professional-development proposal should be submitted to the dissertation committee after passing the Ph.D. Qualifying Exam and forming that committee. [Ideally the proposal should be discussed with the dissertation committee at their first meeting, but must be discussed and approved no later than one semester after passing the Qualifying Exam.](#)

It is the department's expectation that during this process the faculty advisor and the dissertation committee engage with the student in helping to develop a sound and effective PDP plan.

2. After discussion with the dissertation committee, the candidate submits a revised proposal for approval by their faculty advisor (on behalf of the dissertation committee). The advisor then forwards the proposal to the Chair of the GIC for approval by the GIC.
3. Annually, candidates report on their progress towards fleshing out their PDP, using the annual evaluation spreadsheet (see Section 4.3). Candidates should also report their progress to their committee at committee meetings, seeking their advice about any proposed changes or issues.
4. When the candidate has completed all the activities and experiences outlined in their plan, the candidate submits their portfolio to the GIC (the portfolio can be in the form of a full curriculum vitae, along with a brief explanation of how the final portfolio maps into the PDP plan). The GIC certifies completion of the PDP requirement by a letter to the candidate, copied to the advisor and dissertation committee. This letter is placed in the student's file.

5. A PDP plan must be proposed and approved before the General Exam takes place. The GIC will not certify a student lacking an approved PDP plan for Ph.D. Candidacy.
6. Before a dissertation defense is scheduled, the Ph.D. candidate must have a certified PDP.

2.6.2. *Examples of Activities and Experiences That Might Be Included in a PDP:* The following list merely gives examples of PDP activities and experiences – others might be possible.

Teaching

- Teach a course at Lehigh or elsewhere as the instructor of record
- Significant TA effort, teaching a lab or recitation section (not just grading)
- Significant participation in the development of a new course
- Mentoring undergraduate research
- Participation in a teaching-development program

Outreach and communication

- Participation in and development of educational activities in local schools
- Participation in and development of diversity activities at LU and elsewhere
- Science-education talks to outside groups
- Community engagement in the arena of EES subjects
- Presentation to a public school
- Involvement in the political process
- Science blogging and other social-media communication about science

Proposal-writing experience

- GSA, Sigma Xi, or similar proposal to support dissertation research
- Writing a, NSF or other fellowship application
- Participation in writing and submitting a proposal to an outside funding agency

External professional engagement

- Giving a talk or presenting a poster at professional meetings
- Membership and active engagement in professional-society committees
- Internship with a company or government agency
- Service as a science-policy fellow
- Proposing and running a session at a professional meeting
- Proposing and running a field excursion
- Participation in scientific workshops
- Participation in scientific working groups
- Participation in professional short courses (EES or supporting fields and topics)

2.7 *Dissertation Proposal and General Exam Rules and Procedures*

As part of University requirements for the Ph.D. degree, EES requires students to pass the General Exam, which in EES centers around defense of their dissertation proposal. The student must have an approved professional-development plan in place before the General Exam will be scheduled (see below).

2.7.1. *Dissertation Proposal:* The dissertation proposal should be in the form of a formal

research proposal that makes the case for study of a significant research question or questions. The proposal must provide the context for the proposed research including a scholarly review of prior and related work, and the proposal should provide sufficient details about planned work to allow evaluation of the work's chances for success. If the candidate plans a dissertation that amounts to a series of several research projects, it is permissible to focus most of the proposal on one or two of the projects, but the proposal should provide a brief prospectus of additional planned work. Overall the proposal should not only make the case for a compelling research project, but demonstrate that that candidate has a command of the necessary literature and the intellectual and analytical tools required to bring the research to conclusion.

2.7.2. Exam Rationale: While the Qualifying Exam is meant to assess a student's overall potential for the Ph.D. program, in EES the General Exam represents a more focused look at the student's preparation for and ability to carry out the research they propose to do for their dissertation.

2.7.3. Exam Format: The general examination consists of a public oral defense of the written dissertation proposal, which is prepared after consultation with the advisor and supervisory research committee. The defense will be scheduled on a date during the academic year mutually acceptable to the student and the committee but not later than the last day of classes in the student's third semester. The scheduling of the defense should be cleared with the Department's seminar coordinator to avoid conflicts. A majority of the committee must attend, at least three hours must be set aside for the examination, and the exam must not start later than 1 pm. The final draft of the dissertation proposal must be made available to the committee members and the defense publicly announced at least one week prior to the defense. The announcement must include the proposal abstract.

The defense must be chaired by a committee member other than the student's advisor. The defense opens with a 45-minute presentation by the student. After the presentation, the public has an opportunity to ask the candidate questions for 10-15 minutes and then a short recess is called. Upon reconvening the defense, which remains open to the public, the research committee will orally examine the student on issues raised by the proposal as well as any other on other issues that the committee members consider appropriate.

2.7.4. Exam Assessment and Outcomes: At the close of the examination, the supervisory committee will meet in private to consider whether the student's proposal and defense were adequate. Examination results must be made in writing and copied to the student's file. The examining committee may:

- a. pass the student without conditions,
- b. pass the student with written conditions, which the student must fulfill in order to remain in the degree program, or
- c. require a re-examination.

In the event that a re-examination is required, University rules require that it must occur no sooner than five months after the original examination and no later than the beginning of the fifth semester. The general examination must be passed no later than seven months before graduation. All of the above procedures apply to the re-examination except that a third examination is not an allowed outcome: the student must pass, with or without conditions, or fail the second examination. Failure results in termination of the student's

degree program at the end of the current semester.

Assuming that course requirements have been completed, after passing the General Exam most students will be in a position to apply for Candidacy.

2.8 Admission to Doctoral Candidacy

In order to be admitted to candidacy in the EES Department, a Ph.D. student must:

- a. form a supervisory committee,
- b. pass the Qualifying Examination (described below)
- c. write a dissertation proposal,
- d. pass a public oral defense of their proposal, which constitutes the General Examination (described below),
- e. obtain the supervisory committee's approval of the dissertation proposal, course program, [and professional-development portfolio plan](#)
- f. submit an application for candidacy:

The application for candidacy must be turned in to the CAS Associate Dean of Graduate Studies and Research and includes:

- a. the application for candidacy form,
- b. the approved proposal,
- c. the proposed committee composition,
- d. the approved program,
- e. a signed General Examination form, and
- f. a copy of the student's transcript.

2.9 Maintenance of Candidacy

Once a Ph.D. candidate has been admitted to Candidacy, and if they have completed the minimum credits requirements for the degree (48 credit hours entering with an M.S., 72 credit hours if entering with a B.A. or B.S.), the student becomes eligible for maintenance of candidacy, in which the student need register and pay for only one credit per semester.

2.10 Language Requirement

There is no departmental or university-wide foreign language requirement for the doctoral degree.

2.11 Dissertation Requirements

2.11.1. Dissertation Format. The dissertation must address a topic related to the candidate's specialty, show results of original research, provide evidence of thorough scholarship, and make a significant contribution to knowledge in the field. In EES, a general rule of thumb is that a typical dissertation is the equivalent of three substantial publications in peer-reviewed journals. Students often publish papers in the literature during their dissertation studies.

Provided the dissertation meets CAS and University requirements, a variety of formats is possible that can be agreed upon by the candidate and their supervisory committee. A

common model in recent years has been to align dissertation chapters with drafts of manuscripts to be submitted or that have been published. In this case advisors and committees usually require the dissertation to have opening and concluding chapters as well that provide the context for the dissertation work as well as more integrative conclusions. Also required are thorough appendices describing analytical procedures, data-reduction methods, and sample information.

2.11.2. Presentation and Defense of the Ph.D. Dissertation. Candidates for the Ph.D. must publicly present and defend their dissertations.

Defense Timing. The presentation and defense (hereafter referred to as the defense) must occur while classes are in session during the Fall or Spring semesters and before the dissertation is signed or accepted. The candidate must determine a mutually agreeable date in consultation with the Department's seminar-series coordinator and with members of the dissertation committee. The defense must be announced publicly at least one week prior to its occurrence, so the candidate must provide the department coordinator with the dissertation abstract more than one week in advance so that it can be posted. The defense will be scheduled no later than 1 pm on the selected date.

A copy of the final draft of the dissertation must be provided to each committee member at least one week in advance of the scheduled defense. Note that more than a week may be required to adequately accommodate an absentee member who needs time to read the draft and submit questions. Note also that this draft must be in truly final form, including such details as signature and title page, table of contents, tables, figures, and major appendices, in full accordance with the instructions of the University.

In order to graduate, it is also necessary to apply for the degree to the University Registrar, usually very early in the semester in which graduation planned.

Defense Moderator and attendance. An EES department faculty member who is a member of the student's committee but not the principal advisor moderates the defense. Presentation styles may vary but all involved should treat the defense as the serious event that it is. The candidate is responsible for soliciting a moderator and ensuring that members of the committee are notified and can attend. All members of the committee should be present for the defense in either in person or electronically in real time (e.g. Skype), but if great distance, scheduling or other circumstances prevent a committee member from attending, the advisor will solicit the absent member's comments or questions in advance and then present them at defense. In no case may the defense take place with fewer than three committee members in attendance.

Defense Format. The public presentation may not exceed 45 minutes, and the faculty moderator strictly enforces the time limit. Following the presentation, questions from the public are entertained and then the defense is adjourned for a break (questions from committee members are deferred until after the break). When the defense reconvenes, remaining open to the public, the candidate responds to questions posed by the committee, defending the methods, findings, conclusions, and other aspects of their dissertation. The faculty moderator will continue to oversee this portion of the defense, which has no time limit. Once the moderator ensures that all committee members are satisfied with their opportunity to interrogate the candidate, the candidate is excused and

the committee determines the outcome of the exam.

Defense outcomes. Dissertation-committee members can vote either ‘Pass’ or ‘Not Pass.’ This outcome is reported on a Dissertation Defense Form, available in the department office. Committee members attending the defense must sign this form, which should be filled out by the candidate and given to the moderator prior to the defense. All committee members, including those absent on the day of the defense, must sign the cover sheet of the dissertation before it can be handed in with the completed dissertation.

If a majority of the supervisory committee votes ‘Not Pass’ then EES policy is that the student has the option of responding to reviews of the dissertation and rescheduling a defense. Additional attempts at a defense must be scheduled no sooner than three months after the previous attempt, and can continue until the student reaches the time limits for the degree. All rules associated with a dissertation defense continue to apply to repeated attempts.

A common outcome is that students pass the dissertation defense but are required to make modest changes to the dissertation, with final signature approval being left to the advisor’s discretion, or in some cases, additional supervisory committee members.

2.11.3. Submission of Dissertation. After the advisor approves a complete dissertation draft verifying the expectation that the student will complete all requirements by the next graduation date, it is submitted to the CAS Associate Dean of Graduate Studies and Research no later than about six weeks prior to the expected graduation date (consult the CAS graduate office for a schedule of deadlines). This submission gives the College a chance to verify that rules concerning dissertation format have been followed. After revisions are made subsequent to the defense and approved by the advisor, the final draft of the dissertation must be electronically submitted to the CAS Graduate Office, with the last day of classes usually being the deadline for thesis submission and submission of any other paperwork (check the current deadlines). Students must complete copyright and NRC forms at this time. Two unbound copies of the dissertation must be given to the College office, along with a receipt for the submission fee. One of the copies must have the original signatures of the committee members. The University has very definite requirements outlining the form of the dissertation, and they must be strictly followed.

2.11.4. Data and Sample Policy. It is an obligation of each Ph.D. student to arrange for the archiving of all data, computer code, field notes, samples, and other information as requested by the supervisory committee. The advisor retains the right to defer signing off on the dissertation until archiving is complete and carried out to the current standards of the student’s discipline.

2.11.5. Dissertation Publication. It is an expectation in EES that Ph.D. dissertations are published, usually in the form of several articles, ideally before or synchronous with the dissertation defense. Lack of publication, however, is not grounds for an advisor or committee to withhold approval from a dissertation.

SECTION 3. MASTER OF SCIENCE DEGREE REQUIREMENTS AND REGULATIONS

3.1 Coursework Requirements

3.1.1. Overall M.S. Course Requirements. Course work for the M.S. must include a minimum of 30 credit hours. Eighteen of those credits must be at the 400-level, of which three to six credits must consist of thesis research. The remaining 12 or more credits can be earned using any 300- or 400-level EES course as well as any 200-level course or above in another department (subject to approval by the advisor).

Students will not be allowed to register for more than six thesis credits. Until the thesis proposal has been approved, students may not register for more than one credit of thesis research per semester.

3.1.2. EES Course Requirements. Of their total of 30 or more credits, M.S. students must complete 18 credits within EES, 15 of which must be at the 400-level. If the student's planned program absolutely requires fewer than the required minimum of EES credits, the student may petition the Graduate Instruction Committee. Students should plan their program with their advisor in time to make such a petition if it is required.

All M.S. students are required to take one of the Department's three core courses: Tectonic Processes (EES 426), Paleoclimatology (EES 415), or Physical and Chemical Processes at the Earth's Surface (EES 411).

3.2 Time Limit to Degree

The Lehigh M.S. degree requires at least two full semesters of academic work. Once M.S. students begin their degree program, they have a total of six years in which to complete their program. The EES department generally expects students to finish within two academic years and normally will not provide financial aid beyond this period.

3.3 Language Requirements

There is no departmental or university-wide foreign language requirement for the M.S. degree.

3.4 Thesis Committee

Each student must have a thesis committee comprising at least three members, at least two of whom must be Lehigh faculty or research scientists holding the doctoral degree. The student should consult with their advisor about the committee membership, and ideally convene the committee in the first semester but **no later than three weeks before the end of the second semester.**

3.5 Program Plan

As soon as possible, each student should consult with their advisor and committee and prepare a plan and timetable for course and research work that aligns with the student's career interests. The student should fill out the Master's Degree Program-Plan Form and it should be discussed by the committee when the thesis proposal is presented. The

committee members should initialize their names on the Master's Degree Program-Plan Form as indication that they approve the student's Master's Degree Program. The EES Graduate program director signs the Master's Degree Program-Plan Form in the department approval field. This form may be submitted to the CAS Graduate Studies Office after the first year of coursework is completed, but must be submitted by the final semester in or order to graduate. A copy will be stored in the student's file at EES.

3.6 Thesis Proposal

No later than three weeks before the end of the second semester, the student must submit to their advisor a thesis proposal approximately ten pages in length (single-spaced) detailing the problem, hypothesis, scope, and methods of the intended thesis project. After an edited version of this proposal is approved by the advisor, the document should be signed by the advisor and all committee members, forwarded to the GIC for approval and placed into the student's file. The GIC provides departmental oversight and may offer nonbinding comment to the candidate and committee on the course program or research proposal.

3.7 Thesis and Thesis Defense

3.7.1. Thesis. M.S. students in the EES Department are required to complete a thesis in order to graduate. Departmental expectations are that the typical M.S. thesis should yield the equivalent of one manuscript suitable for publication in a peer-reviewed journal. The final thesis must be in the form specified by the University, so students should be sure to find and follow the thesis submittal instructions provided by the CAS Graduate Office. A final copy of the approved thesis must be prepared for the EES Department chairperson and the thesis advisor. As a courtesy, it is also appropriate to offer a copy of the thesis to each member of the supervisory committee.

3.7.2. M.S. Defense Timing. The **thesis defense including presentation must be scheduled during the academic year, while classes are still in session** in the relevant semester. The student should meet early with the committee responsible for scheduling the research seminars and arrange a date for the presentation. The student must also consult the departmental seminar coordinator to be sure that there are no conflicts with scheduled seminar events. The presentation and defense are made before the final draft of the thesis is approved so that any improvements that come to light during the final reading and presentation may be incorporated into the final draft. Supervisory committee members must receive **a complete draft of the thesis at least one full week prior to the scheduled defense**. Also, more than one week prior to the defense, an abstract of the thesis must be given to the department coordinator for posting.

3.7.3. M.S. Defense Format. EES requires that M.S. students defend their thesis as a requirement for graduation. The defense is required prior to final approval of the thesis by the advisor in consultation with the thesis committee. The defense consists of a formal presentation of the major findings of the thesis project in seminar format to the Department followed by a period of questioning from the supervisory committee. The seminar should be about 30 to 40 minutes long to permit time for general questions afterwards. A faculty moderator must be solicited by the presenting student ahead of time and cannot be the thesis advisor. The moderator, in addition to introducing the student,

will enforce this time limit and field questions from the audience at the conclusion of the seminar (questions from the committee and advisor are held until after the break). After a short break at the conclusion of the seminar, the student and their supervisory committee will reconvene to address the committee's questions concerning the research. This portion is also open to the public and lasts as long as is necessary.

3.7.4. Defense Outcomes. After the defense, the advisor and thesis committee members confer in private. Final approval of the thesis is the responsibility of the advisor, in consultation with members of the committee. Generally provisional approval of the thesis is given pending suggested revision, with final advisor required before submission.

3.7.5. Submission of Thesis. After final advisor approval, the student submits their thesis electronically to the CAS Associate Dean of Graduate Studies and Research, with the last day of classes usually being the deadline for thesis submission and submission of any other paperwork (check the current deadlines). Note that the University has very definite requirements for thesis formatting, and they must be strictly followed.

3.7.6. Data and Sample Policy. It is an obligation of each M.S. student to arrange for the archiving of all data, computer code, field notes, samples, and other information as requested by their advisor. [The advisor retains the right to defer signing off on the dissertation until archiving is complete](#) and carried out to the current standards of the student's discipline.

3.7.7. Thesis Publication. It is an expectation in EES that M.S. theses are published. Lack of publication, however, is not grounds for an advisor or committee to withhold approval of a thesis.

SECTION 4. OTHER REQUIREMENTS FOR BOTH M.S. AND PH.D. DEGREES

There are several other formal departmental requirements that pertain to both M.S. and Ph.D. candidates.

4.1 Graduate-Student Symposium

Late in February, EES devotes an afternoon and evening to a research colloquium designed, organized, and presented by EES graduate students. The colloquium is modeled after a typical professional-meeting session, involving both posters and oral presentations. An abstract volume is prepared in advance and published. [All students must submit an abstract and make a presentation, attend the event](#), and confirm their attendance in their annual report.

The symposium serves several purposes. It permits graduate students an opportunity to develop and experiment with communication skills in a supportive environment. The symposium also fosters mutual understanding of research work within the department and possible opportunities for collaboration. Finally the symposium serves to showcase graduate-student research to visitors such as alumni and prospective students.

4.2 Departmental Seminar Attendance

EES hosts a departmental seminar most weeks that classes are in session, and [graduate students are required to attend these](#). The department views these seminars as important opportunities to learn about current research, assess presentation styles, showcase the department to visitors, and meet scientific peers. While no formal attendance is taken, absence from more than an occasional seminar will be noted and logged in the student's annual review. Lack of engagement with the seminars series could factor into financial-aid decisions and certification that the student is making adequate progress.

4.3 Graduate-Student Annual Report

At the end of every Spring semester, each graduate student must submit an annual report to the Chair of the GIC. Currently this report is in the form of an annually updated spreadsheet that can serve as a record of the student's progress and accomplishments. Separate forms are available for M.S. and Ph.D. students.

SECTION 5. POLICIES RELATED TO DEGREES

5.1 Transfer Between M.S. and Ph.D Programs

5.1.1. Transfer from M.S. to Ph.D. Program. After consulting with their current adviser, a student admitted or working toward an M.S. degree within the Department may choose to apply for transfer to the Ph.D. program. If the student is a first-year M.S. candidate, they must submit a letter to the Graduate Coordinator requesting admission to the Ph.D. program, briefly outlining the intended research, along with a current transcript and a letter of endorsement from the intended advisor. If a second-year M.S. candidate, the letter from the student must place the intended project in the context of their ongoing M.S. research, as well as provide information about research committee changes and an expected timetable for completion of the Ph.D. All candidates must have an interview with the GIC after materials have been received. Submitted applications will be evaluated and the Graduate Coordinator will notify students of the outcome.

Generally, transfer between programs in the first and fourth semester will be infrequent. Fourth-semester transfers should not be viewed as a means to circumvent the normal admissions process, and having reached their fourth semester students might be better served in obtaining the M.S. degree (in which case they would need to have made a new application for admission to the doctoral program earlier in the academic year).

A first-semester M.S. candidate accepted into the department's Ph.D. program takes the Qualifying and General Examinations as would normally be scheduled for a newly admitted doctoral student (see Section 2.5).

A student admitted to the Ph.D. program in the second through fourth semesters of their M.S. program must take the qualifying Exam (see Section 2.5) in the same semester they are accepted into the Ph.D. program, and they will need complete the General Exam by the end of the subsequent semester.

For a student planning to complete an EES M.S. degree and then wishing to remain with EES for a Ph.D., application should be made by the end of their third semester using the normal admissions process.

5.1.2. Transfer from Ph.D. to M.S. Program. A student may decide to transfer from the Ph.D. to the M.S. program. In this case, all the course and thesis requirements for the M.S. degree will apply. The student should consult with their advisor and then notify the Graduate Coordinator in writing of their plan to transfer between degree programs. Students are strongly advised to contact the CAS Graduate Office as well for advice about any paperwork that might be required. Note that departmental expectations about timing and duration of financial aid will still apply (See Section 3.2).

5.2 Full-time status

The University requires M.S. and Ph.D. students to be registered for at least 9 credits per semester in order to automatically receive full-time status. This can be important for tax and other legal reasons such as visa status, and full-time status is required in order to receive financial aid. Students taking fewer credits because they have completed course requirements can petition for full-time status by completing a certification form approved by the department.

5.3 Leaves of Absence

5.2.1. Parental Leave and Longer-Term Unpaid Leave (University Policies). If planned or unplanned circumstances occur which require a student to significantly interrupt their degree program, the student may apply for an unpaid leave of absence for up to one year, with the possibility of extending this to a second year by petition. Beyond two years, absence from the program will require the student to reapply for admission. There is also a complementary parental leave policy for graduate students that provides for five weeks of financial support. Additional information about these [leave policies, procedures, and necessary forms](#) can be found at the web pages of the graduate-life office.

5.2.2. Shorter-Term Paid Emergency Leave. EES will make every effort to support any student who requires an emergency short-term leave. If a graduate assistant (TA, RA, GA, or student on Fellowship) is unable to fulfill the duties of their appointment because of sudden illness, injury, or a family emergency, a student should inform their advisor and the EES Chair as soon as possible. Every effort will be made to assist the graduate assistant in performing their duties for the duration of the semester. If the graduate assistant cannot perform any duties, their stipend will be maintained for up to two pay periods or the end of the semester or summer pay period, whichever occurs first [i.e. student gets two (2) biweekly paychecks, subsequent to a request for immediate leave]. Such a request for short-term paid leave should be made in writing to the EES Chair, and certification of illness from a health-care provider or other documentation may be requested.

If the circumstances are such that this paid leave is inadequate to provide sufficient time to resume his or her duties, the student may petition the EES chair to grant some additional paid leave.

If the student's source of funding is external to the University, prior to granting the leave, it is the responsibility of the relevant grant's PI to ensure that commitments to the supporting grant or contract will be fulfilled and that the funding agency rules allow the implementation of such a leave. Ordinarily, funding agencies defer to the policies of the institution, however, in the event the funding agency has different defined policies, the agency policies will prevail.

5.2.3. Impact of Leaves on Requirements and Timelines. For the duration of a leave of any kind, deadlines for qualifying and general examinations, financial-aid limitations, and course requirements will be put on hold. For formally approved leaves, the maximum times to complete M.S. and Ph.D. degrees will be extended for the duration of the leave.

5.2.4. Other Considerations. It is important to note that graduate assistants are considered students under federal law, not University employees and therefore, the leave policy is a guideline, not an entitlement.

For any leaves that occur or begin in the middle of a semester and require a student to cease any coursework, it is important to file drop/add forms with the Registrar, which may allow for a prorated refund of tuition charges.

Leaves of absence may impact the immigration status of international students; affected students should contact Lehigh International Office for current information and advice.

5.4 Financial Aid

As a general policy EES attempts to provide all M.S. and Ph.D. students who are pursuing research-based degrees with financial aid in the form of tuition and stipend. This aid can take the form of teaching assistantships (TAs), research assistantships (RAs), and graduate assistantships (GAs), all of which require duties amounting to 20 hours per week of work, and fellowships which do not require any duties. Fellowships, TAs, and RAs may only be held by full-time students who are considered to be in good standing and making adequate progress. Current department policy is that support for continuing students is a priority over the recruiting of new students. However, it is very important to understand that this policy represents a good-faith effort to provide support and is subject to the availability of sufficient resources – EES cannot guarantee continuing support.

5.4.1. Continuing Students and Time Limits for Internal Aid. EES will generally provide financial aid for a limited duration consistent with our expectations about the time needed to complete a degree, as follows. For M.S. students, up to four semesters of support; for Ph.D students who entered with an M.S. degree, up to six semesters of support; for Ph.D students who entered with a B.S. or B.A. degree, up to eight semesters of support. These time limits apply to all sources of internal aid: University, College, and Departmental funding, including TAs, GAs, and departmental, College, and University fellowships, and scholarship credits.

Graduate students may request extended support (up to one semester for an M.S. student and up to two semesters for a Ph.D. student). Requests from the student should be in the form of a letter addressed to the GIC chair, describing the extenuating circumstances,

other aid sources the student and advisor have explored, and a timetable for completion of the thesis or dissertation. Separately, the student should arrange for their advisor to provide a written endorsement of the request. It is important to make requests in the fall semester for the following academic year because the department needs to be able to project what resources are available for other continuing students and for recruiting. Preference will be given to students who have had external support. No matter the circumstances, EES cannot guarantee that requests for extended support will be met, partly or in full. Note that these time limits do not include periods during which the student is on an approved leave of absence.

In exceptional cases stemming from major unforeseen circumstances out of the student's control, EES might provide an additional extension of financial support on a semester-by-semester basis; such support will be rare.

Note that the time limits the department places on financial support are shorter than the total time limits the University places on completing a degree (see Sections 2.3 and 3.2).

5.4.2. Time Limits and RA or Other External Support. Beyond the duration of departmental time limits, a student's support can be extended by externally derived funds such as outside fellowships and other such sources, or RA support provided by an advisor's research grants. **It is important to understand that even if a student was originally supported partially or completely using RA or other external funds, the department will not provide internal support past the limits listed above in Section 5.4.1.**

5.4.3. Teaching Assistantships (TAs). The Department offers both half-time and quarter-time teaching assistantships. As needed, the College pays the tuition for a teaching assistant (TA), up to nine credits per semester for half-time and up to five credits for quarter-time. The TA receives a monthly stipend for the 9-month academic year, from late August to late May. In some cases EES will also choose to invest funds in summer support for students awarded TAs, in order to provide a 12-month package, but this is not guaranteed.

Responsibilities for a TA vary depending on the course or courses they are assigned, and may include grading homework sets and exams, setting up and teaching labs, and running field trips. TA duties are assigned and evaluated by course instructors. Half-time TA's should provide 20 hours per week of service to the University. Quarter-time TA positions involve 10 hours per week of work. Some students may be awarded TA tuition credits (> 3 - 9 credit-hours of tuition) in exchange for quarter-time TA service.

TAs should be aware that their TA awards require adequate performance, which includes all aspects of their duties including timely grading of assignments. Should a TA continue to perform poorly even after being warned, the department reserves the right to terminate the award, even in the middle of a semester.

The University requires foreign students whose native language is not English to pass a test of spoken English before serving as a TA, whatever their TOEFL scores or whether they have had other degrees from a U.S. institution. If a student is likely to be assigned a TA position and there is concern about whether the student can pass the exam, the student and their adviser should consult the EES Chair about support for various language-improvement programs offered by the University. **It is important to note that if a student**

assigned a T.A. does not pass the language exam, the department is not obligated to provide other forms of support. Because lack of stipend support could lead to serious personal hardship as well as problems with visa status, foreign students as well as their advisors should plan carefully.

Performance of T.A.s is assessed using course evaluations filled out by the students they have worked with. In addition, T.A.s can request feedback from their supervising faculty member.

5.4.4. Graduate Assistantship (GAs). In some circumstances students might be awarded a G.A. Expectations and compensation are similar to those for a T.A., with the chief difference being that G.A.s might do a variety of different tasks in support of the department teaching, research, or services missions, separate from direct support of formal courses.

5.4.5. Research Assistantships (RAs). A position as an RA provides tuition and stipend paid much like a TA's and generally at the same rate, and effort expectations are the same: about 20 hours per week of effort. The chief difference lies in the responsibilities, which for an RA involves various tasks on a particular research project assigned and evaluated by a principal investigator (usually one's advisor). Often, research work assigned to an RA will support research related to the RA's thesis or dissertation, but this need not be and is not always the case. It is important for both an R.A. and their supervisor to communicate and have a clear understanding of expectations about work involved with the R.A. position.

5.4.6. Fellowships. Fellowships also include provide both tuition and stipend support, and are generally offered to incoming students. The Department nominates several students annually to compete for several Lehigh University and CAS Fellowships and awards two internal Kravis Fellowships. There are no specific responsibilities associated with a fellowship, as they are an acknowledgement of prior academic performance and research potential. Thus, the student is free to spend one's time working on research.

5.4.7. Scholarships. Scholarships consist of tuition credits only - no stipend is included. The Department has a limited number of scholarships to award annually. The Department usually tries to combine a scholarship award with a stipend package that does not fund tuition, but occasionally the scholarship may be offered by itself.

5.4.7. Limitations on Outside Employment. Students receiving academic-year financial aid must receive permission before engaging in employment outside the department or the University. The final approval for TAs to work beyond their normal 20 hours per week rests with the CAS Associate Dean for Graduate Studies. Permission will be considered using the following guidelines:

- a. a student must have completed all course work for the degree,
- b. there can be no conflicts with the student's TA, GA, or RA assignment, and
- c. the student must be making satisfactory progress towards their degree.

It is extremely important that students and their advisor pay attention to this rule because of tax and benefit ramifications and because of the impact total work hours could have on student status.

5.4.8. Withdrawal of Financial Aid. Separate from the availability of resources, continuation of financial aid is contingent on a student making adequate progress towards their degree and remaining in good academic standing. The GIC will recommend withdrawal of aid packages if a student fails to maintain at least a 3.0 grade average, fails to adhere closely to the thesis timetable, shows a persistent lack of commitment to his or her own professional development as documented in their annual progress reports, or achieves consistently poor results in their T.A., G.A., or R.A. duties. These factors are the chief bases for evaluation when the Department considers continuing financial aid, and if resources are right, students making satisfactory progress (in coursework and research) will be given preferential consideration for available aid packages.

5.5 Termination of Degree Program

Separate from issues of financial aid or performance on specific exams like the Qualifying and General exams for Ph.D students, students must continue to make overall adequate progress towards their degrees. Such progress is monitored collectively by the GIC through examination of annual reports, by supervisory committees, and by student advisors. Any of these entities can raise concerns about progress and if so, will consult one another.

If a consensus develops that a student's performance is falling short and that formal action beyond routine advising is required, as a first step the advisor should talk with the student and express the concerns that have been raised, and develop a mutually agreed-upon plan for remedy that includes a firm timeline; a letter summarizing the concerns and remedy will be placed in the student's file. If poor performance continues, the GIC and advisor will consult and also notify the supervisory committee. The GIC chair will then write a letter of warning to the student, copied to their file, their advisor, their committee, and the EES chair, informing them that they have a short time, usually a semester, to show a clear and consistent turnaround in performance (specific details about timeline and requirements may vary).

Finally, if after this warning the student shows no or little improvement in performance, on recommendation of the advisor the GIC Chair will write a letter to the CAS Associate Dean for Graduate Studies recommending that the student's degree program At Lehigh be formally terminated. This letter will provide a brief synopsis of the reasons for this recommendation and will be shared with the student, who will have a week to submit a written response and rebuttal to the Associate Dean. The Associate Dean may then request additional information from the department, and will make the decision whether to formally terminate the student's program, conveying this decision in writing through a letter addressed to the student and copied to the EES Chair, GIC Chair, and advisor.

5.6 Workplace Expectations and Grievance Procedures

5.6.1. Workplace expectations. Like all staff and faculty members in EES, M.S. and Ph.D. candidates should have full expectation that their workplace is safe and supportive, free from any harassment, hostile conditions, or discrimination. EES supports and honors Lehigh's [Principles of Equitable Community](#) and expects students to do the same. Inappropriate behavior of any kind by any student or member of the faculty and staff is unacceptable. In addition, EES expects all its members to adhere to professional ethical

standards in the conduct of research.

5.6.2. Reporting Harassment and Workplace Issues. In its [Policy on Harassment](#) the University has established a clear series of steps to take if one of its members feel that they have been subjected to any form of harassment, discrimination, or hostile work environment. This document also has extensive information about the reporting process, what to do in various situations, and what sorts of behavior are unacceptable. Current information about where to report a complaint or concern can be found at <https://titleix.lehigh.edu/university-policies-and-procedures>. Ultimately, a number of different people are available to serve as first contacts should a student feel that a complaint might be warranted. These include:

- a staff member in the Dean of Students Office;
- an academic department chair;
- an administrator (for the purposes of this policy, administrators include academic associate deans and deans of the four colleges, vice provosts, assistant and associate vice presidents, vice presidents, and the president);
- the Ombudsperson;
- the Provost;

5.6.3. Other Grievances. Clear expectations (responsibility of the faculty), a committed effort towards achieving those expectations (responsibility of the student), and good communication (responsibility of everyone) can usually avoid most problems. However, separate from cases of harassment (see above), if conflict or disagreement arises and a student has concerns or complaints about a department member, procedure, outcome, or their treatment, EES suggests the following course of action.

Students should first consider pursuing the direct resolution of conflicts before they escalate. If this is not fruitful or the student feels uncomfortable or unable to do this, the next step would normally be to consult their advisor if the issue pertains to other students, instructors, administrators, or staff. If the issue is related to the advisor, or if the advisor cannot help resolve it, the student should bring their concern to the GIC Chair. If this does not provide a satisfactory solution or the GIC Chair is part of the conflict, the student can instead try to rectify the situation by speaking first with the EES Chair, and finally, if necessary, the CAS Dean of Graduate Studies.