Tulane University

Graduate Program in

Earth & Environmental Sciences

Student Handbook
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Procedures for Graduate Study in the Department of Earth and Environmental Sciences (EES) at Tulane University

Admission Requirements

Applicants to the Department of Earth and Environmental Sciences are expected to have a broad scientific background with undergraduate degrees in the natural and physical sciences or related fields such as engineering and mathematics. In addition to thorough preparation in their major degree field, students are expected to have taken the following general courses in physics, chemistry, biology, and geology and to have a solid foundation in mathematics. All applicants must meet University GRE and GPA requirements. Application information is available from the School of Science and Engineering and from the Earth and Environmental Sciences department office.

Financial Support

*Usually, admission to the graduate program depends upon one or more of the faculty expressing an interest in having the student as an advisee.* However, exceptionally prepared students will be offered admission with the expectation that they commit to a program of study by the end of their first year for Ph.D. and by the end of their first semester for Masters. The Earth and Environmental Sciences Department supports students with Teaching Assistantships (TA), Research Assistantships (RA), and Research Fellowships (RF). In addition, students are encouraged to pursue funding for their research by applying for outside awards and grants. (http://tulane.edu/sse/eens/graduate-research-opportunities.cfm).

Categories of Admission

The Department of Earth and Environmental Sciences (EES) offers two advanced degrees, the Master of Science and the Doctor of Philosophy. These degree programs and other categories of admission are explained below:

Regular degree students are ordinarily admitted into the graduate program to pursue a Doctor of Philosophy or Master of Science degree with financial support associated with the student’s faculty advisor or the School of Science and Engineering.

Provisional admission may be granted to students who have not completed all application requirements.

Probationary (non-degree) admission may be granted with conditions that must be fulfilled in the first-year of graduate enrollment in order to achieve regular degree status.

Special (non-degree) students are individuals who do not plan to pursue a graduate degree. They may take a maximum of nine hours of graduate work; special students may
reapply to the School of Science and Engineering for admission into a regular degree program.

**Faculty Advisor**

Students are encouraged to formalize this relationship by selecting an advisor, and communicating this to the Graduate Committee by the end of the first semester of study. The faculty advisor must be a regular (full time) member of the department. Tulane University also has an agreement with the Louisiana Universities Marine Consortium (LUMCON) that will allow for adjunct scientists there to serve as advisors for graduate students. The student will consult his/her advisor in order to develop a course of study; course registration must have the advisor's approval. Students who do not elect to choose an advisor in the first semester of study should contact the Graduate Committee to plan a course of study. The faculty advisor may be changed upon request by submitting a letter to the Graduate Committee signed by the student and the faculty advisor(s).

**Annual Report and Quality of Work Rules.**

All graduate students who have been enrolled in EES for at least six months must submit to their major advisor an annual report that briefly describes progress made during the previous year. This report must be also be submitted to the Graduate Committee in Rm. 101 Blessey Hall for placement in the student's file. Annual reports will be reviewed by the EES Graduate Committee and departmental faculty to determine whether or not satisfactory progress has been made. Unsatisfactory progress for one year may result in temporary probationary status. Students must also comply with the quality of work rules of the University, which state that no student may receive a grade of B- or below in any course. Receipt of one B- will generate a warning by the School of Science and Engineering, and an additional B- will result in expulsion from the program. Grades below B- will result in immediate termination of degree status.

**Continuing Registration.**

A student admitted to Tulane University in a degree program must be in continuous registration (exclusive of Summer Session) until the degree is awarded. Students who have advanced to candidacy must register for **Dissertation Research**, which carries zero credit but maintains continuous registration. Masters students may register for **Masters Research**. Alternately, students may register for an **Independent Study** with approval of their advisor. Students in residence not receiving a university stipend and who have not completed the minimum course requirement for the degree must enroll for a minimum of three semester hours each semester, or register for Master's or Dissertation Research, in order to maintain continuous registration. Consult the rules of the School of Science and Engineering for these requirements. Maximum tenure for master's students is three years and for doctoral students is six years. After these periods, the student must meet with the
advisor and the Graduate Committee annually in order to receive an extension. The committee’s decision to grant an extension will be determined by department resources (available RA’s and TA’s) as well as extenuating circumstances that will vary from case to case.

**Foreign Language Requirements.**

There is ordinarily no foreign language requirement for either graduate degree, but a student's dissertation committee may require demonstration of proficiency in one or more languages within guidelines established by the School of Science and Engineering. Any such language requirement must be fulfilled prior to the qualifying examination.

**Exceptions.**

Students may petition the Graduate Committee in writing on an individual basis for exceptions to the aforementioned procedures.

**DOCTOR OF PHILOSOPHY DEGREE PROGRAM**

**Course Requirements.**

A total of 48 semester hours of approved graduate course work must be completed for the doctoral degree and students must maintain a GPA of B or better. A maximum of 24 semester hours of transfer credit is generally allowed for doctoral students; these credits must be approved by the Graduate Committee and must have been acquired from an accredited university within six years of graduate admission at Tulane. Students must be registered for a minimum of nine semester hours in order to be considered full time students.

**Qualifying Examination.**

The qualifying examination is a test of scholarly competence and knowledge with emphasis on the student's area of research. The qualifying examination for the Ph.D. will occur during the fourth semester at Tulane. In preparation for this, the Graduate Committee will meet with the student to discuss the requirements during the preceding semester.

The qualifying examination is designed to evaluate whether the prospective Ph.D. candidate can successfully meet and complete the requirements of the Ph.D. in Earth and Environmental Sciences at Tulane University. The exam will test the prospective Ph.D. candidate’s knowledge of the broad field of Earth and environmental sciences, and will evaluate the student’s ability to identify and outline procedures to address and solve particular research questions.
The Graduate Committee will approve the members of the prospective student’s qualifying Exam Committee as suggested by the student’s advisor. The Exam Committee will consist of at least three faculty members of the Department of Earth and Environmental Sciences at Tulane. If it is necessary to include a scientist/engineer from outside of the Department of Earth and Environmental Sciences in order to fully evaluate the merits of a proposed research project, the student can petition the Graduate Committee in advance for inclusion of such professionals within the examination. All members of the Examining Committee must be members of the faculty at Tulane.

Qualifying exams for all prospective Ph.D. candidates in the Department of Earth and Environmental Sciences will take place during the first two weeks of April (or in November, in cases of those students who have enrolled in January). Prior to the exam, and specifically during their third semester at Tulane, each prospective Ph.D. student must have the titles of two distinct research projects approved by the Graduate Committee. The prospective Ph.D. candidate will submit two research proposals describing the two distinct research projects at least one week before the exam to their Examining Committee. Although there is no set length (i.e., number of pages) that is required by the Graduate Committee or Examining Committee for each proposal, the proposals should thoroughly describe the research projects, including why the research is important (e.g., background and previous studies), what scientific questions will be addressed in each proposal, and what methods will be employed to answer these questions. As a guideline it is reasonable that each proposal will be on the order of 10 to 15 pages of single-spaced, 12-font text, not including cited references. The student should assume that both proposals will be treated with equal weight during the oral exam by the Examining Committee.

During the oral portion of the qualifying exam, the student will first present a thoughtfully prepared summary of each proposal, including the objectives, preliminary and expected results, and any conclusions potentially drawn from each proposed study. During the initial presentation portion of the exam, the student should expect that any, and potentially all, members of the faculty, graduate student body, and undergraduate student body of the Department of Earth and Environmental Sciences may attend. Upon finishing the presentation of both proposals, the prospective doctoral candidate will be expected to answer any questions from anyone in attendance during the presentations. Subsequently, and after excusing all but the Examining Committee, the prospective doctoral candidate will be questioned by the Examining Committee on the two proposed projects. This questioning may include the student’s general knowledge of the Earth and environmental sciences as well as the details of both proposals, including elemental assumptions/knowledge underlying each proposed project.

The two proposals presented during each student’s exam will be based on small research projects initiated during the first year of academic study at Tulane. A chief objective is for the student to show that he/she is capable of conducting worthwhile research on a specified topic, recognize the significance of the research, and place the potential results within the context of current knowledge of the topic. The student will not be required to have fully completed the research (i.e., final results). Instead, the students will be asked to convincingly demonstrate to the Examining Committee the depth of knowledge they
have gained in their research efforts, to thoughtfully be able to discuss experiments/additional data required to complete the research, and address the implications of such research. Addressing the projects in terms of how they will advance the general understanding will provide the student the chance to demonstrate overall knowledge about his/her field of study.

For their qualifying exam research projects, the student will select subjects that are relevant to more than one research area of faculty within the Department of Earth and Environmental Sciences. We encourage students to choose projects that involve use of different methodologies/techniques as well as the broad expertise of the department faculty. Projects using different analytical techniques/methodologies/approaches to solve the same problem are, however, not acceptable. Each written proposal as well as the corresponding oral presentations should succinctly communicate to the Examining Committee the rationale for the proposed research project, the results of the study, and any consequences for Earth and environmental sciences. There is no set format as to how the student should present their research proposals to the Examining Committee, however, the should limit the presentation of each proposal to not more than 20 minutes, for a total of 40 minutes for both. It is critical to recognize that the oral presentations of the chosen research projects will be the chief mechanism by which the Examining Committee will be introduced to the projects, and from which questioning will commence.

Immediately following the examination, the prospective Ph.D. candidate will be informed by the chair of the Examining Committee regarding the examination’s outcome. The outcome will be either successful or unsuccessful. In the case of a successful outcome, the student will be allowed to apply for candidacy for the Ph.D. degree upon successful completion of the required course work. In the case of an unsuccessful outcome, the Examining Committee may elect to provide the student with a second opportunity for a successful outcome of the qualifying exam. Second opportunities to take the qualifying exam will be take place during the next cycle of exams. A student who procures an unsuccessful outcome for their second attempt at the qualifying exam will be removed from the doctoral degree program but may be awarded a Master of Science degree at the discretion of the faculty. For all possible outcomes, the Examining Committee will provide a written statement to the student and his/her research adviser, outlining the result of the qualifying exam that may include suggestions regarding the student's preparation for candidacy.

**Dissertation Committee.**

The faculty advisor and dissertation committee are selected to guide the student's dissertation research. The dissertation committee must be formalized after successful completion of the qualifying exam and while the student is preparing the full dissertation prospectus. The faculty advisor serves as chair of the dissertation committee and ensures that the student develops a course of study that will give proper foundation to the dissertation research. The committee shall be chaired by the student’s academic advisor and shall consist of at least 3 other faculty; two of which shall be Tulane faculty. One
committee member must be from outside the University. The committee shall be formed with the intention of involving researchers of broad expertise who will serve to benefit the student’s understanding of the scientific problems central to the thesis.

**Full Prospectus.**

After successful completion of the qualifying examination, the student will submit a draft of his or her dissertation prospectus (10 – 15 pages, single-space, 12-font text) to the dissertation committee (see below). One or both of the proposals from the qualifying exam can form the basis for the dissertation prospectus. The prospectus outlines the program of research that will result in an acceptable dissertation. The prospectus must describe proposed research aimed at answering specific questions and should demonstrate that all necessary equipment, literature, technical skills, and other resources necessary to execute the planned work are available. The proposed research questions should be clear and specific; the answers to the questions should promise to be important conceptual generalizations in the field of study. An extended abstract (2-3 pages in length) will be included as part of the application packet to the School of Science and Engineering for admission to candidacy.

Evaluation and approval of the thesis prospectus will be the purview of the student’s dissertation committee.

**Admission to Candidacy.**

To be admitted officially to candidacy for the doctoral degree, a student must have completed all course requirements, satisfied all foreign language requirements (if any), passed the qualifying examination, and submitted an extended abstract based on an approved dissertation prospectus, as well as turned in all forms required by the School of Science and Engineering.

**Dissertation.**

The written dissertation is the culmination of doctoral degree work and is the necessary demonstration of the candidate's ability as a scientist and scholar. The dissertation, therefore, must be a genuine and original contribution to the body of scientific knowledge in the field of study. The dissertation must be at least partially worthy of publication in scholarly journals and must include all data generated for the thesis in addition to any publications. If the student has already published papers on his or her research, these may be included as chapters in the dissertation. The faculty advisor and the dissertation committee must agree on the acceptability of the dissertation before it is defended. Instructions on preparing the dissertation document are found in the *Thesis and Dissertation Preparation Guidelines* under the School of Science and Engineering. Strict adherence to University formatting guidelines is required.
Dissertation Defense (Final Examination) and Seminar.

The final examination is an oral defense of the dissertation following a public presentation of the dissertation research. All doctoral candidates must present their dissertation research as a public lecture. The subsequent dissertation defense is conducted in closed session by the student's faculty advisor and dissertation committee. Candidates, who have successfully defended their dissertation, and who have met all other departmental and university requirements, are recommended for the doctoral degree. An additional copy of the dissertation must be submitted to the department.

MASTER OF SCIENCE THESIS PROGRAM

Course Requirements.

Twenty-four semester hours of approved graduate course work are required for the Master’s degree, plus six credits of thesis research. The six hours of research credit must result in the production of an acceptable thesis. In general, up to 12 semester hours of transfer credit will be accepted toward the master's degree; guidelines for acceptability of transfer credit can be found in the Graduate Bulletin. The Graduate Committee must approve all transfer credits.

Committee.

The faculty advisor and committee are selected to guide the student's research. Students are expected to form a committee by the end of their second semester. The faculty advisor serves as chair of the thesis committee and ensures that the student develops a course of study that will give proper foundation to the thesis research. The committee must consist of at least three faculty who are regular (full time) members of the Department of Earth and Environmental Sciences faculty or two full time Department of Earth and Environmental Sciences faculty and an outside faculty member. Membership in the thesis committee may be dynamic, but each subsequent change in its composition must be approved by the student, his/her advisor, and the Graduate Committee.

Prospectus.

Students pursuing the M.S. degree are required to meet with their committee in the beginning of the third semester, and preferably during their second semester, to discuss their proposed thesis research. A full prospectus is required by the end of the third semester. The dissertation committee will consider the student's academic background and approve the proposed course of study. The prospectus outlines the program of research that will result in an acceptable thesis. The prospectus must describe proposed research aimed at answering specific questions and should demonstrate that all necessary equipment, literature, technical skills, and other resources necessary to execute the
planned work are available. The posed research questions should be clear and specific; the answers to the questions should promise to be important conceptual generalizations in the field of study, or better, extend to other fields as well.

In consultation with the faculty advisor and thesis committee, the student must submit a synoptic version of his or her thesis prospectus to the School of Science and Engineering for approval by the Dean. Appropriate forms can be found on the School of Science and Engineering’s web site at:


A copy of this approved thesis prospectus must be deposited with the EES office for placement in the student's file.

**Thesis.**

A student's faculty advisor will also be the director of his/her thesis research. The thesis committee must approve the completed thesis. The thesis research must be presented to the department in a public forum and defended at an oral examination conducted by the thesis committee. Specific instructions for thesis preparation are given on the School and Science and Engineering’s web site at:


Strict adherence to School of Science and Engineering format for theses is required.

**Changing from the M.S. to the Ph.D program.**

Students accepted into the master's program must petition the Graduate Committee for admission into the Department of Earth and Environmental Sciences doctoral program; a member of the Department of Earth and Environmental Sciences faculty must be willing to serve as the student's doctoral dissertation advisor. Students who transfer from the M.S. to the Ph.D. program must complete a Master's thesis and all requirements for the Ph.D. degree outlined above, including the qualifying examination.
PROGRAM MILESTONES

The following figures represent the upper limits of time spent achieving the given milestones. In most cases, it is preferable that the student reach these milestones in a more timely fashion.

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Master of Science</th>
<th>Doctor of Philosophy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection of Advisor</td>
<td>2nd Semester</td>
<td>2nd Semester</td>
</tr>
<tr>
<td>Research Topic Identified</td>
<td>2nd Semester</td>
<td>2nd Semester</td>
</tr>
<tr>
<td>Selection of Research Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Courses completed</td>
<td>4th Semester</td>
<td>4th Semester</td>
</tr>
<tr>
<td>Prospectus Approved</td>
<td>before end of 3rd semester</td>
<td>before end of 4th semester</td>
</tr>
<tr>
<td>Qualifying Examination</td>
<td>NA</td>
<td>4th Semester</td>
</tr>
</tbody>
</table>

Submission of final Thesis/ Dissertation 6th Semester 12th Semester

The Graduate Committee monitors the progress of all students. To continue in a degree program, a student must make satisfactory progress towards the degree. If the Graduate Committee determines that satisfactory progress is not being made; a student may be required to withdraw because of academic deficiency. A student may appeal a determination of lack of satisfactory progress to the School of Science and Engineering.

Non-thesis M.S. Programs

EES offers additional M.S. programs that are based solely on coursework. These programs include: 1) an M.S. in the Department of Earth and Environmental Sciences (EES); and 2) a joint-degree program with EEB leading to an M.S. in Environmental Sciences. Thirty semester hours of approved coursework are required for the non-thesis Master’s degree. Students must adhere to the quality of work rules given above. In general, up to 6 semester hours of transfer credit will be accepted toward the master's degree; guidelines for acceptability of transfer credit can be found in the Graduate Bulletin. The EES Graduate Committee must approve all transfer credits. Transfer credits must be in excess of those required for the B.S. degree for students entering the 4+1 program described below.

The five-year, combined non-thesis degree program is open to students enrolled in Tulane University’s Newcomb-Tulane College. It combines the Bachelor of Science degree in the EES with the terminal Master of Science degree in Earth & Environmental Sciences, condensing what would normally be about six years of study into five years.

Undergraduate students typically graduate after four years of study, having fulfilled all regular requirements for the B.S. degree. The accelerated master’s degree component allows six graduate credits (two 600- or 700-level courses) completed during the senior
year to be applied to the B.S. degree as well as to the M.S. degree. Each student pursuing the M.S. degree then completes course work toward the master’s degree during one additional year of graduate study. During the fifth (graduate) year the student typically completes a minimum of 24 credits (eight courses, four each semester) of graduate work for a minimum total of 30 semester hours (10 courses).

Candidates for the program should apply for admission during the junior year, but students in their senior year also may apply. By the end of the junior year (or at the time of application), candidates should have completed all LAS proficiency and distribution requirements for the B.S. degree and all core requirements the EES major. In addition, candidates are required to have a minimum 3.0 cumulative GPA in their major. To advance to the fifth (graduate) year, candidates must complete all requirements for the B.S. degree in EES by the end of the senior year, while maintaining the minimum 3.0 cumulative and EES. Teaching assistantships are generally not available to students pursuing the non-thesis degree programs.