I. Ph.D. Program Areas of Study

The Civil and Environmental Engineering (CEE) Department offers the opportunity for advanced study and research leading to the Doctor of Philosophy degree in Environmental Science and Engineering. The educational objective of this program is to produce graduates who are capable of conducting original research in industry or academia as well as assuming a leadership role in their chosen employment field. This is a multidisciplinary program administered by the CEE Department. It encompasses faculty and facilities from the College of Sciences and the CEE Department, as well as individual faculty from other UTSA departments. The program has three separate tracks, namely Environmental Science, Environmental Engineering, and Civil Engineering. The Ph.D. degree in Environmental Science and Engineering is awarded to candidates who display an in-depth understanding of the subject matter and demonstrate the ability to make an original contribution to knowledge in their field of specialty.

II. Governance

The Director of the ESE PhD Program is a faculty member in the CEE Department appointed by the Dean of the College of Engineering. The Director serves as the Graduate Advisor of Record (GAR) and the Chair of the Doctoral Studies Committee (DSC). The DSC consists of the Director and 7 faculty members, 4 from the College of Engineering and 4 from the College of Sciences. Faculty members are rotated every 2 years through elections amongst all the faculty members that participate in this joint program. The current DSC composition can be found at http://engineering.utsa.edu/ce/programs/doctoral/. The DSC manages admissions, funding decisions, written qualifying examinations, curriculum development and course offerings and scheduling.

III. Admissions Requirements

Applicants must satisfy the following requirements; in addition to satisfying the University-wide graduate admission requirements (refer to UTSA Graduate Catalog Chapter 1, Admission):

- a Bachelor of Science degree and a Master of Science degree from an accredited university, and a minimum grade point average of 3.0 in upper-division and graduate courses. The degrees should be in biology, ecology, environmental science, chemistry, geology, geography, environmental engineering, civil engineering or other related scientific or engineering discipline. Exceptional applicants without a Master of Science degree may be considered for admission to the program on a case-by-case basis;
- three letters of recommendation from persons familiar with the applicant's academic potential;
- official Graduate Record Examination (GRE) scores;
Applications must be submitted to the UTSA Graduate School online at http://graduateschool.utsa.edu/. Incomplete applications will not be considered. Acceptance to the program is decided by the Doctoral Studies Committee (DSC), comprised of graduate faculty members selected from the CEE Department and the College of Sciences. Full-time students accepted for the program are eligible to apply for financial support in the form of competitive teaching assistantships, research assistantships, or research fellowships.

**Funding** All full-time students who apply to the ESE Ph.D. program are automatically considered for program funding. Alternatively, students can secure funding by contacting directly individual faculty members in the ESE Ph.D. program. Students supported with assistantships will be required to fulfill academic duties by working as a graduate research assistant, or a teaching assistant. Students receiving funding through these assistantships normally are responsible for covering their own medical insurance. Each assistantship is renewable on a yearly basis based upon student progress in the program. To qualify for renewal of funding, a student must be in good standing (i.e., maintain a 3.0 GPA and have fulfilled all their obligations as outlined in the original offer letter issued to them), and must be enrolled in 9 hours in the Fall Semester, 9 hours in the Spring Semester, and 3 hours in the summer semester.

**IV. Degree Requirements**

The Doctoral program in Environmental Science and Engineering requires that students complete a minimum of 60 semester credit hours beyond the Master’s degree. This coursework includes courses that have been designed to provide advanced instruction in areas considered to form the foundation for the disciplines of environmental science and engineering. Enrollment in the Graduate Seminar is required for a minimum of 2 semester credit hours. A minimum of 15 semester credit hours of Doctoral Research and 15 semester credit hours minimum of Doctoral Dissertation must be completed prior to graduation. Any grade lower than “B” in graduate or remedial coursework at the undergraduate level does not count toward the 60 semester credit hours. Students can apply, with the approval from the chair of their Dissertation Committee, up to 12 semester credit hours of graduate coursework to elective courses (see below), if not applied toward their Master’s degree. Students with only a baccalaureate degree are required to have a minimum of 75 semester credit hours to graduate.

21 semester credit hours of required elective courses must be selected by each student according to his/her selected track of study, as defined below. These need to be approved by the Chair of the DSC and the student’s Dissertation Committee. These elective courses may be offered by departments in the College of Sciences, the College of Engineering or by other departments at UTSA.
**Dissertation Committee.** Students must choose a Dissertation Committee consisting of a chair and at least four additional graduate faculty members. This committee must include a minimum of one faculty member from the CEE Department and one from the College of Sciences. Students must submit the names of their Dissertation Committee to the DSC Chair by the end of their second semester of study.

**Program of Study**

<table>
<thead>
<tr>
<th>Hours</th>
<th>A. Degree Core Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>CE 5001 Process and Ethics in Thesis/Dissertation</td>
</tr>
<tr>
<td></td>
<td>Research Development</td>
</tr>
</tbody>
</table>

One of the following:
- CE 5043 Advanced Civil Engineering Statistics
- ES 5023 Environmental Statistics

One of the following:
- CE 5013 Civil Engineering Systems Analysis
- ES 5233 Experimental Design and Analysis

One of the following:
- CE 6113 Global Change
- ES 5043 Global Change
- GEO 5043 Global Change

<table>
<thead>
<tr>
<th>Hours</th>
<th>B. Track Electives</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>These can be selected from 5000–7000 level courses offered in Civil and Environmental Engineering or other departments, with the approval of the Environmental Science and Engineering Doctoral Studies Committee.</td>
</tr>
</tbody>
</table>

1. **Environmental Science Track Electives**
   The objective of this track is to train students in conducting research in the various aspects of environmental science with a focus on the application of physical and biological sciences in solving environmental problems. These elective courses can be selected from the graduate courses offered by the College of Sciences, the CEE Department or other UTSA departments. The overall program of study for this track may differ by no more than 12 semester credit hours from the program of study for the Ph.D. degree in Environmental Science and Engineering and must be approved by the student’s Dissertation Advisor and the Doctoral Studies Committee.

2. **Environmental Engineering Track Electives**
   The objective of this track is to train students in
conducting research in the various aspects of environmental engineering with a focus on the application of science and engineering principles in sustaining the natural environment (i.e., air, water and land). Elective courses can be selected from the graduate courses offered by the College of Sciences, the CEE Department or other departments. The overall program of study for this track may differ by no more than 12 semester credit hours from the program of study for the Ph.D. degree in Environmental Science and Engineering and must be approved by the student’s Dissertation Advisor and the Doctoral Studies Committee.

3. Civil Engineering Track Electives
The objective of this track is to train students in conducting research in the various aspects of civil engineering with an emphasis on the application of civil engineering principles in the design, construction, and maintenance of the physical and naturally built environment. Elective courses can be selected from the graduate courses offered by the CEE Department or other College of Engineering departments. The overall program of study for this track may differ by no more than 12 semester credit hours from the program of study for the Ph.D. degree in Environmental Science and Engineering and must be approved by the student’s Dissertation Advisor and the Doctoral Studies Committee.

C. Other Electives
These can be selected from 5000–7000 level courses offered in Civil and Environmental Engineering or other departments, with the approval of the Environmental Science and Engineering Doctoral Studies Committee.

D. Seminars
CE 6221 Graduate Seminar in Environmental Science and Engineering
or
ES 5981 Graduate Seminar in Environmental Science and Engineering

E. Doctoral Research and Dissertation
CE 7211-3 Doctoral Research (15)
CE 7311-3 Doctoral Dissertation (15)
or

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 7211-3</td>
<td>Doctoral Research</td>
<td>(15)</td>
</tr>
<tr>
<td>ES 7311-3</td>
<td>Doctoral Dissertation</td>
<td>(15)</td>
</tr>
</tbody>
</table>

Total semester credit hours required 60

**Advancement to Candidacy.** Ph.D. students advance to candidacy after completing their written and oral qualifying examinations. First, students must complete the core curriculum courses and then take the written qualifying examination. Full-time students must take the written qualifying examination by the end of their second semester of study. Part-time students need to take the written qualifying examination at a time dictated by the DSC. This examination is administered by the DSC with input from the faculty participating in the program. The written qualifying examination tests the student’s undergraduate background, their degree of understanding of the material presented in graduate courses, as well as their critical thinking and written communication skills. No more than two attempts to pass the written qualifying examination are permitted. Students who fail the written qualifying examination twice are terminated from the program. The Qualifying exam has two parts.

**Part I:** You must take and it will be two questions, one on ethics and one on the interface of engineering and science.

**Part II:** Is separated into 3 tracks (Environmental Science, Environmental Engineering, and Civil Engineering) before getting the exam you will decide which track you want to take. Each track has different topic areas that the questions for the track will be based on. You must complete 3 questions from the track you choose.

Topics areas under each track are:

**Environmental Science**
- Geology
- Spatial Science (e.g. Remote sensing, GIS, etc.)
- Ecosystems/Ecology
- Environmental Chemistry
- Statistics

**Environmental Engineering**
- Environmental Engineering (e.g. Water & Wastewater treatment, air pollution, risk analysis, etc.)
- Water Resources
- Spatial Science (e.g. Remote sensing, GIS, etc.)
- Environmental Chemistry
- Statistics

**Civil Engineering**
- Structural Engineering
- Transportation Engineering
- Geotechnical Engineering
- Water Resources
- Statistics
Upon successful completion of the written qualifying examination, students are allowed to take Doctoral Research credit hours. Students must take their oral qualifying examination within two semesters after passing their written qualifying examination. The oral qualifying examination is a dissertation proposal defense. The dissertation proposal should describe the topic, the literature review, the proposed methodology and experimental approach, as well as highlight the novelty and potential contribution of the topic to the scientific field. The student’s Dissertation Committee chair must approve the student’s research proposal before scheduling the oral examination. Upon successful completion of the oral qualifying examination, students advance to Ph.D. candidacy and are allowed to take Doctoral Dissertation credit hours. No more than two attempts to pass the oral qualifying examination are permitted. Students who fail the oral qualifying examination twice are terminated from the program.

Results of the written and oral examinations must be reported to the DSC and the Dean of the Graduate School. Admission into the Doctoral program does not guarantee advancement to candidacy. After advancement to candidacy, the student’s Dissertation Committee can be changed at the student’s request and with the approval of the chair of the DSC.

**Dissertation.** Candidates must demonstrate their ability to conduct independent research by completing an original dissertation. The Dissertation Committee guides, critiques and finally approves the candidate’s dissertation. The format of the dissertation must follow the doctoral degree regulations of the Graduate School as documented under Chapter 5 of UTSA Graduate Catalog.

**Final Oral Dissertation Defense.** The student must notify the Graduate School in writing two weeks prior to the final scheduled oral defense. The final oral defense consists of a public presentation of the dissertation, followed by a closed oral defense. Results of the oral defense must be reported to the Dean of the Graduate School. Awarding of the degree is based on the approval of the Dissertation Committee and the Dean of the Graduate School. The Dean of the Graduate School certifies the completion of all University-wide requirements.

**Research Expectations.**
- Actively participate in seminar and engage with invited speakers
- Publish at least 2 peer-reviewed journal articles
- Present work at 1 technical conference

**IMPORTANT LINKS:**

CE Faculty: [http://engineering.utsa.edu/ce/research/researchFac.html](http://engineering.utsa.edu/ce/research/researchFac.html)
ESE Faculty: [http://engineering.utsa.edu/ce/research/ESEPhDfac.html](http://engineering.utsa.edu/ce/research/ESEPhDfac.html)
Graduate School: [http://www.graduateschool.utsa.edu/](http://www.graduateschool.utsa.edu/)
Graduate Catalog: [http://utsa.edu/gcat](http://utsa.edu/gcat)
Milestones Agreement Form
Environmental Science and Engineering (ESE) Doctoral Program

This form is provided for the purpose of informing students about the academic milestones that they will be expected to reach in order to earn their Ph.D. degree as well as when they are expected to complete these milestones. Students are expected to reach each milestone within the specified time period in order to make satisfactory progress through the program. Students who are not making satisfactory progress may lose funding, be placed on academic probation, or be dismissed from the program.

Academic Advising
Upon entering the ESE Ph.D. program, all students will be assigned an advisor. The advisor will be a member of the program department. This advisor normally becomes the dissertation adviser of the student. Should the student decide to change technical areas, the GAR will serve as the interim advisor, until a new dissertation adviser can be identified.

Dissertation Advisors are responsible for the following:
Academic advising includes the following elements that are designed to ensure that students remain in good academic standing and make satisfactory progress through the program.

- Providing suggestions on course selection
- Reviewing the student’s Degree Plan to determine if the student is making progress consistent with the expectations of the program and reaching milestones according to the timeline provided on this form; working with the Doctoral Studies Committee and student to determine if modifications are necessary
- Clarifying the timetable for completing any remaining course requirements, examinations, and other requirements
- Providing the student with assistance in understanding the requirements for successful completion of dissertation
- Meeting with students at regular intervals (at least monthly) to review progress of research/dissertation
- Providing the student with assistance in assembling a dissertation committee
- Providing the student with experiences and information that will optimize the student’s career opportunities and success

Students are responsible for the following:

- Meet with their advisors at regular intervals (at least monthly) and present their progress on their assigned research tasks in writing
- If a student is full time and paid by the program or research funds, they must be present and on campus throughout the year.
- Full-time students must take their written qualifying exam, typically held in May, within the first 2 semesters of their studies, or the earliest May thereafter.
- Part-time students must take their written qualifying exam, typically held in May, within the first 4 semesters of their studies, or the earliest May thereafter.
- Full-time students must pass their oral qualifying exam within 2 semesters after passing their writing qualifying exam.
- Part-time students must pass their oral qualifying exam within 4 semesters after passing their writing qualifying exam.
All students must pass their dissertation defense within 4 semesters after passing their oral qualifying exam.

Requirements for all Students in the ESE Ph.D. Program

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Expected Time of Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of student’s progress with (Dissertation Advisor)</td>
<td>Monthly</td>
</tr>
<tr>
<td>Successful completion of oral and/or written qualifying exam</td>
<td>See above</td>
</tr>
<tr>
<td>Coursework successfully completed</td>
<td>Prior to Diss. Start</td>
</tr>
<tr>
<td>Dissertation Committee appointed and approved by Graduate School</td>
<td>Prior to Diss. Start</td>
</tr>
<tr>
<td>Dissertation proposal completed and approved</td>
<td>2 semesters after passing Written Qualifier</td>
</tr>
<tr>
<td>Student admitted to doctoral candidacy</td>
<td>After completed and approved oral qualifier</td>
</tr>
<tr>
<td>Dissertation completed, successfully defended, and approved by Committee</td>
<td>4 semesters after passing oral qualifier</td>
</tr>
</tbody>
</table>

Degree Completion Checklist for Students

- Maintain active student status by registering for courses every fall, spring and summer semester
- Complete Milestones Agreement Form with your advisor no later than the last day of class the Fall semester (if admitted in Fall) and Spring semester (if admitted in Spring)
- Complete all required organized coursework
- Schedule and successfully complete required qualifying exams
- Form your dissertation committee in consultation with your advisor and dissertation Chair
- Have your committee approved by program GSC and Graduate School
- Prepare and successfully present your dissertation proposal
- Apply for Advancement to Candidacy
- Enroll in required dissertation hours and complete your dissertation
- Successfully complete your defense of your dissertation
- Submit required documentation to the Graduate School for completion and graduation

I have read this form and have had the opportunity to discuss the information contained in it with my advisor. I understand the academic milestones that I am expected to reach in order to successfully complete the XXX program, as well as the expected timeline for completing these milestones.