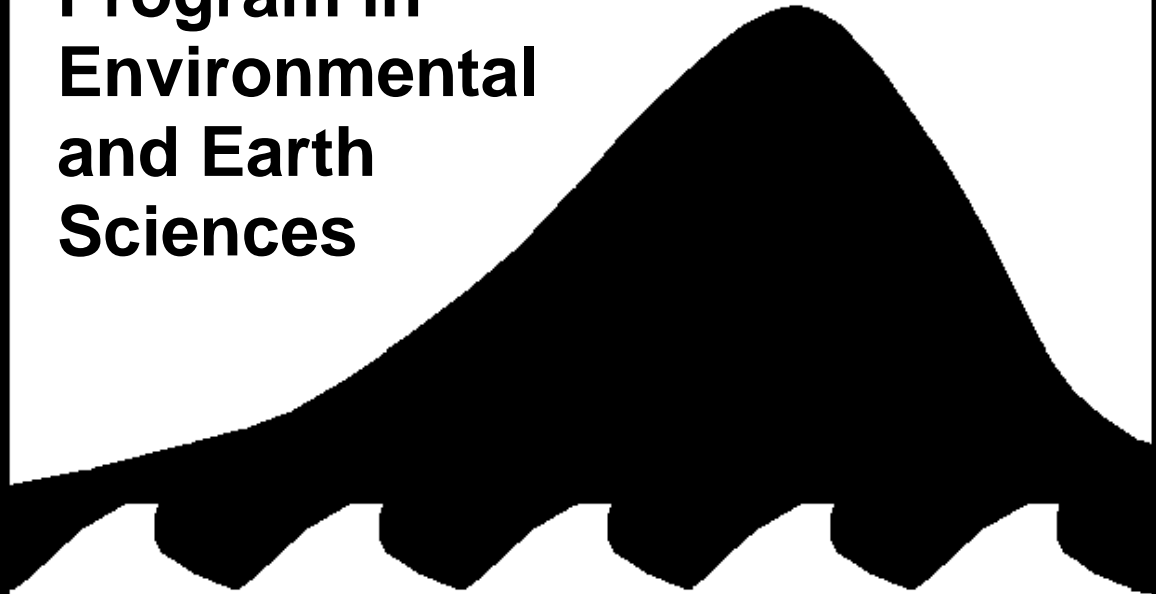


**Program in
Environmental
and Earth
Sciences**



The University of Texas at Arlington

Graduate Student Handbook

2008 – 2009

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University of Texas at Arlington**

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OVERVIEW OF THE GRADUATE PROGRAM

The program in Environmental and Earth Sciences is designed to provide a graduate student an integrated, multidisciplinary education, nurtured through a carefully tailored degree program requiring a breadth of understanding and mastery of a spectrum of scientific and engineering principles. Among the goals is to provide students who have earned engineering or science undergraduate degrees a common ground for interdisciplinary communication, and understanding of the environment, and competence in a discipline that will allow him or her to evaluate and solve complex environmental problems.

The program offers the Master of Science degree in Environmental and Earth Sciences (both thesis and nonthesis options) and the Doctor of Philosophy degree. The Master of Science program is designed to prepare students to pursue careers in industry, government and teaching, or for further graduate education leading to a doctorate. The Doctoral Program provides additional training in science, engineering, and planning coursework aimed at producing a sophisticated, solution-oriented approach to environmental problems, while providing training in research and scholarship through the dissertation. An interdisciplinary, problem-solving approach characterizes all courses of study in this program.

This document is a general publication only for planning assistance. It is not intended nor does it contain all regulations related to students. The provisions of this document do not constitute a contract, express or implied, between an applicant, student, faculty member, the Program in Environmental and Earth Sciences, the participating Departments and Colleges, The University of Texas at Arlington, or the University of Texas System. The University reserves the right to withdraw courses at any time, change fees, rules, calendars, curriculum, degree programs, degree requirements, graduation procedures, and any other requirements affecting students. Changes will become effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled.

Students are held individually responsible for complying with all requirements of the rules and regulations of the Program, the University, and the Board of Regents of the University of Texas System. Failure to read and comply with policies, regulations and procedures will not exempt a student from whatever penalties he or she may incur.

GRADUATE PROGRAM POLICIES

UTA Graduate School Policies

The Graduate School sets the general requirements and procedures for graduate study at The University of Texas at Arlington and the Graduate Dean certifies and awards graduate degrees. To allow time for certification and validation of procedures and requirements, the Graduate School sets deadlines by which required procedural matters must be completed. Deadlines must be adhered to by the student in the process of completing a graduate program. The Graduate School announces deadline dates for each semester in the Graduate School calendar. The deadlines can be found on the inside front and back cover of the current Graduate Catalog. The responsibility for meeting established deadlines **resides with the student**.

Graduate School Deadlines

Graduate School deadlines are final at 5:00 p.m. on the date specified; all transactions relating to the subject of the deadline must be completed and documentation received in the Graduate School by that time. Transactions requiring the action or approval of the Graduate Advisor, committees, departmental chairperson, instructors, academic deans, or others prior to receipt by the Graduate School should be initiated by the appropriate person (student, Graduate Advisor, or other) sufficiently in advance of the Graduate School deadline to allow the required actions to be completed, approvals to be obtained and documents to be filed in the Graduate School before the deadline expires. The Graduate Advisor initiates those actions that are routinely his responsibility and those actions that routinely arise and/or are required for all students, and attempts to inform both students and faculty by memo of Graduate School deadlines for each semester. However, each student should consult the current Graduate Catalog (inside front and back covers) and become familiar with upcoming deadlines in a semester.

Admission into the Graduate Program

The following are minimal requirements for entrance into the graduate program in Environmental and Earth Sciences. However, satisfying or exceeding these requirements does not guarantee admission to the program. Admission to the program is determined solely by the Graduate Studies Committee in Environmental and Earth Sciences and the Graduate School and is based on an evaluation of all pertinent aspects of an applicant's record.

General Requirements

To enter the Graduate Program in Environmental and Earth Sciences individuals must have completed, minimally, a Bachelor's degree in mathematics, science, or engineering from an accredited college or university. Students with a Bachelor's degree in other fields will also be considered. Depending on their prior work and preparation, new students may be assigned one or more deficiency courses, which must be taken and passed within the first year of enrollment. Individuals must also have maintained an acceptable grade point average at previously attended institutions. Applicants must submit current scores on the general aptitude portion of the Graduate Record Examination (GRE). These scores are considered in admission decisions. Masters students who have succeeded in the EES program typically score higher than 550 on the quantitative portion of the GRE. Doctoral students who have succeeded in the EES program typically score higher than 600 on the quantitative portion of the GRE. Applicants must demonstrate through previous academic performance the potential for graduate work. Factors that may be considered include review of transcripts and coursework, recommendation letters, correspondence or direct interactions with program faculty, and written statements of research interests. Transcripts of individuals holding a degree from an international college or university (a college or university outside the United States) are evaluated by the Graduate School for "equivalency of degrees". If it is determined that an individual's degree is not equivalent to a bachelor's degree as granted by a US institution, the individual must complete additional course work before admission can be considered. Applicants whose native language is not English must achieve a minimum score of 550 on the Test of English as a Foreign Language (or an equivalent score on the computer-based test), or a score of 40 on the Test of Spoken English. Three letters of recommendation are required for each applicant.

Continuation in the Program

After admission into the program, the student must:

- a) establish and maintain academic good standing; and
- b) make satisfactory progress towards completion of the degree as judged by the supervising professor/supervisory committee. A student is considered to be in academic good standing if: a grade-point average of 3.0 on all work undertaken as a graduate student is maintained; and any admission conditions are absolved within the time required. In particular, any assigned deficiency courses must be taken and passed within one year of enrollment. Students may not take deficiency courses on a pass/fail grading basis.

If a graduate student fails to maintain an overall 3.0 grade-point average on the first six hours of graduate course work, the student will be placed on academic probation. The student's record will be evaluated at the completion of each semester while on probation. Failure to establish an overall grade-point average of 3.0 upon completion of the first 12 hours of graduate course work will result in automatic dismissal from the program. If a student's overall grade point-average falls below 3.0 at any time after completion of the first 12 hours of course work, the student will be placed on academic probation: The overall grade-point average must be raised to 3.0 at the end of the semester subsequent to being placed on probation or the student will be dismissed.

If a student's progress towards completion of degree requirements is judged to be unsatisfactory by the supervising professor/supervisory committee, the student will be advised of his/her failure to progress. If, at the end of the semester following such advisement the supervising professor/supervisory committee finds that the student's progress towards completion of degree requirements remains unsatisfactory, the student will be dismissed from the program.

Master's Program

Options

Two options are offered at the master's level, nonthesis and thesis. The nonthesis option is designed to meet the needs of those seeking career qualifications for industry, government, or teaching. The thesis option may be chosen by, and is recommended for, anyone seeking research experience in environmental science in addition to coursework.

Nonthesis option

The nonthesis option requires completion of 38 hours of course work, including 15 hours of core courses in Environmental and Earth Sciences; 9 hours of formal course electives concentrated in one of the following units: Biology, Chemistry, Geology, Civil and Environmental Engineering, or Urban and Public Affairs; 12 hours of formal course electives, with at least 6 hours in unit(s) outside that in which the first 9 hours of additional elective courses are taken; and 2 hours of seminar. Students may take the course EVSE 5395 Master's Project to obtain research experience, but it may not be repeated for credit towards their degree requirements.

Thesis Option

The thesis option requires completion of 38 hours of course work, including 15 hours of core courses in Environmental and Earth Sciences; 9 hours of formal course electives concentrated in one of the following units: Biology, Chemistry, Geology, Civil and Environmental Engineering, or Urban and Public Affairs; 6 hours of formal course electives; 6 hours of thesis research; and 2 hours of seminar.

Supervising professor and supervisory committee

A student in the master's program must select a faculty member who agrees to serve as the student's supervising professor. For those following the nonthesis option the supervising professor will advise on all aspects of the student's program; for those in the thesis option the supervising professor will oversee and direct the thesis

project and advise on all aspects of the student's program. The supervising professor should be selected as soon as possible but no later than the end of the student's first semester of work. In consultation with the supervising professor, two additional faculty members must be selected to complete the supervisory committee. All faculty members must be Full or Associate members of the Graduate Faculty of the University. At least one faculty member must be a Full or Associate member of the Graduate Faculty of the Program in Environmental and Earth Sciences from a department outside that of the student's supervising professor. The supervisory committee is responsible for the design of the student's program, conducts the final oral examination for thesis degree plan candidates and determines the scope, content and form of the final master's comprehensive examination for nonthesis degree plan candidates. If for any reason the membership of the Supervisory Committee must be changed after it has been established, the change must be made by notifying the Graduate Advisor.

Program requirements

Fulfilling Deficiency Courses and Probationary Admission Conditions

Deficiency courses and probationary admission conditions are often specified in a student's admission letter. In general these requirements should be fulfilled within one year of enrollment in the program. Exceptions must be discussed with the program's Graduate Advisor. Upon completing deficiency courses or probationary admission conditions, the student should inform the Graduate Advisor so that this may be noted in their record and registered with the Graduate School.

Initial Degree Plan Worksheet

The student must choose a supervising professor, form a tentative supervisory committee, and file a Degree Plan Worksheet (i.e. a form which lists anticipated courses to be completed to satisfy degree requirements) during the first semester of full-time work on the Master's degree but no later than the completion of the first 12 hours of graduate work. The Degree Plan Worksheet should be filed with the Program's Graduate Advisor. It should include any approved transfer credit (up to the 9 hour maximum allowed by the Graduate School), courses in progress, and courses required by the supervisory committee or the department, including leveling courses, to satisfy requirements of the degree. If the student desires to apply transfer credit, the EES Graduate Studies Committee must approve the hours and the Degree Plan Worksheet must be filed during the student's initial semester of enrollment in the graduate program. The Degree Plan Worksheet form can be obtained from the Graduate Advisor, and the Graduate Advisor and the Program Director can help students choose a supervising professor and select committee members. All courses that appear on the Tentative and Final Programs of Work must be taken for a grade of A-F where that is an option.

Outline of Research Plans

Each student in the thesis option must submit an Outline of Research Plans to the supervisory committee not later than the end of the second semester of work. The outline should contain detail sufficient to allow the supervisory committee to evaluate the appropriateness and feasibility of the proposed research. Approval of the outline may require a committee meeting or may be gained through individual consultations with committee members. In any event, each member of the supervisory committee must indicate approval by signing the outline. A copy of the signed outline must be filed with the Graduate Advisor no later than the end of the student's second semester of graduate work.

Continuing Enrollment

The Graduate School has a continuing enrollment requirement. Graduate students must enroll for at least one credit hour of coursework, seminar, research or independent study during the fall and spring semesters. Exceptions are allowed only if the student requests and is granted a Leave-of-Absence through the Graduate School.

Final Degree Plan Worksheet

The Final Degree Plan Worksheet is prepared during the student's last semester, when all courses have been

completed or are in progress, and the final program defense and graduation are anticipated. The Final Degree Plan Worksheet must list all courses taken to satisfy the degree requirements and any other requirements set by the supervisory committee. The Final Degree Plan Worksheet requires the signature of each of the supervisory committee members, the Chairman of the Graduate Studies Committee in Environmental and Earth Sciences and the Graduate Advisor. The student must allow sufficient time for completing the form and obtaining signatures. Before preparing the Final Degree Plan Worksheet, the student should obtain a current GMAP form from the EES Department Office. Classes entered on the Degree Plan Worksheet to fulfill particular degree requirements should agree with the same designations on the GMAP form. Any discrepancies should be resolved in consultation with the Graduate Advisor. The Thesis Defense or Master's Comprehensive Examination is also scheduled and taken during the final semester, and must be scheduled in advance through the Graduate School. The results of the defense or examination must be reported to the Graduate School on the required form by the required deadline for the semester. Students must also file an Application to Graduate by the required deadline for the semester. Students in their final semester should consult the graduation checklist on the Virtual Advisor link of the Graduate School Web Page for forms and deadlines.

Thesis

The thesis is a written narrative presenting the results and conclusions drawn from the completion of an original research project. The project is directed by the supervising professor with advice and counsel from the remaining members of the supervisory committee. When completed, the thesis must be approved by the supervising professor. On his or her approval, a copy of the thesis must be provided to each member of the supervisory committee for their evaluation and suggested revisions, if any. On approval by the supervisory committee the thesis may be presented to the Graduate School for the required mechanical check. The mechanical check determines that the mechanics of the thesis (margins, neatness, correlation of page numbers listed in the Table of Contents with numbers in text, etc.) meet the requirements set by the Graduate School. Mechanical errors must be corrected before the thesis will be accepted by the Graduate School. The thesis must comply with the requirements set forth in the current edition of *Thesis and Dissertation Manual of Style*. The Graduate School sets deadlines for submission of the thesis for the mechanical check and for submission of the final copies of the approved thesis (copies incorporating corrections required by the Graduate School, if any, and meeting the approval of the members of the supervisory committee as indicated by their signatures on the appropriate page of the thesis).

Final Program Examination

A final program examination is required for all master's degree candidates. The format of the examination differs for nonthesis and thesis program students, as detailed below. Examinations are scheduled by filing a Request to Hold the Final Master's Examination with the Graduate School. The form must be filed by the Graduate Advisor. The Request to Hold the Final Master's Examination must be filed two weeks prior to the examination date, but not later than the deadline date set by the Graduate School for the applicable semester (see Graduate School deadlines in the Graduate Catalog). The "Request..." must contain the time, location, and type (i.e. written or oral) of examination, and must be signed by each member of the supervisory committee and the Graduate Advisor. The final program examination must be held on the date requested, but not later than the date set by the Graduate School as the final date to hold the exam for the applicable semester. In the event that a Final Master's Exam is canceled or results in the requirement of a re-examination (see below) a new "Request" must be filed in order to reschedule the exam. All members of the supervisory committee must be present before the exam may proceed. The nonthesis program examination may be both written and oral and is open to faculty only; the thesis program examination is an oral defense of the thesis, open to faculty, students and invited guests.

Nonthesis Program Examination

Nonthesis candidates must complete an oral examination composed by the student's supervisory committee. The subject matter of the exam will include basic material covered in the EES core courses, and will also usually relate to material covered in formal courses that the student has completed with his/her committee members. The oral exam is administered by the supervisory committee, but is open to all faculty members. The supervisory committee determines if the candidate's performance during the oral exam is acceptable or unacceptable, but questions may be posed by faculty other than the committee and those faculty members may discuss their

impressions of the candidate's performance with the supervisory committee. The supervisory committee may find that the candidate: (a) passed unconditionally; (b) passed conditionally upon meeting specified additional requirements; (c) failed, with permission to retake the exam after a period specified by the supervisory committee; or (d) failed with a recommendation to the Dean of the Graduate School that the candidate be dismissed from the program. In cases (b) and (c) the supervising committee may choose to administer a written examination, in place of or in addition to another oral examination.

Thesis Program Examination

Thesis candidates must hold an oral defense of the work presented in the thesis. The candidate must provide a completed copy of the thesis to each member of the supervisory committee two weeks prior to the scheduled exam. At least one week prior to the defense, a copy of the thesis must be given to the graduate advisor so that interested faculty and students may read the work. The defense consists of an oral presentation of the thesis work by the candidate followed by an oral examination period in which the candidate answers questions from members of the audience. The candidate first entertains questions relating to the thesis work from the general audience (faculty, students, guests) after which all but the student's committee and interested faculty are excused. The candidate is then questioned by the supervisory committee. After questioning by the supervisory committee, the candidate is excused and the committee evaluates the candidate's performance. All faculty members present may express their opinion of the candidate's presentation and judgment of the overall acceptability of the candidate's defense to the supervisory committee members, however, the committee is the ultimate judge of the acceptability of the candidate's defense. The supervisory committee may conclude that the candidate: (a) passed unconditionally; (b) passed conditionally upon meeting specified additional requirements; (c) failed, with permission to retake the exam after a period specified by the supervisory committee; or (d) failed with a recommendation that the student not continue in the program.

Final Master's Examination Report

A Final Master's Examination Report indicating the results of the final master's examination must be filed in the Graduate School no later than three weeks prior to the date on which the degree is expected to be conferred, irrespective of the results of the exam. Preparation and filing of the report is the responsibility of the Graduate Advisor. The candidate should query the Graduate Advisor to confirm that the report was filed.

Additional Requirements for Graduation

A student in the nonthesis option must be registered for at least one graduate course in the semester in which the final master's examination is held. A student in the thesis option program must be enrolled for six hours of thesis (EVSE 5698) in the semester in which the final master's examination is held. Once enrolled for thesis, continuous enrollment (enroll for thesis, EVSE 5398-5698, each semester) must be maintained until graduation. An Application for Graduation must be filed with the Graduate School and the Diploma Fee paid no later than the filing deadlines for the Application for Candidacy and Degree Plan Worksheet in the applicable semester. If a student does not graduate in the semester in which an Application for Graduation was filed and a diploma fee was paid, he/she must again file for graduation and pay another diploma fee in the semester in which graduation is expected. Additional fees are required from students completing a thesis to cover costs of processing the document.

Time Limit

All requirements for the master's degree must be completed within six years (military service excepted) from initial enrollment.

Residence

Master's degree students are expected to spend the equivalent of two semesters of full-time study in residence at UTA.

Admission to the Doctoral Program before Completion of the Master's Program

Students are not admitted to the doctoral program unless they have completed 30 semester credit hours of graduate coursework, or have obtained a Master's degree. Students not meeting these requirements may be admitted to the Master's program for their initial enrollment, and then apply for doctoral status upon completing 30 semester credit hours of graduate coursework. Students who intend to pursue the Ph.D. should discuss this with the Graduate Advisor at the earliest possible opportunity. Admission to doctoral status will require identifying a doctoral dissertation advisor ("major professor") who will guide your research for the Ph.D., and obtaining their support to enter the Ph.D. program.

Doctoral Program

Admission into the Doctoral Program

In addition to the general requirements, applicants must have a master's degree or at least 30 hours of graduate work in Environmental and Earth Sciences, or one of the sciences, engineering or mathematics. Students who have been admitted to the Master's program in Environmental and Earth Sciences may apply for doctoral status after completing 30 hours of graduate work.

An entering student must have a faculty sponsor (i.e. a member of department faculty who has agreed to direct the student for at least the first semester of graduate work). Applicants must communicate with the appropriate faculty member(s) prior to or during the application process to obtain sponsorship. In most cases, the sponsor will be the student's choice as supervising professor for the dissertation, but the student may choose a different supervisor after entering the program. A supervising professor must be selected by the end of the second semester of enrollment in the doctoral program and the Graduate Advisor must be notified. **A student who does not select a supervising professor by the end of the second semester may be asked to leave the program.**

Requirements of the Doctoral Program

The Doctoral Program provides students with the interdisciplinary knowledge and skills to conduct independent research in Environmental and Earth Sciences. Students conduct dissertation research under the supervision of a faculty member in one of the participating units (Biology, Chemistry, Geology, Civil and Environmental Engineering, or Urban and Public Affairs). The supervising professor and a faculty committee assign courses in this primary area of emphasis to support the student's research and professional goals. To provide interdisciplinary training, additional courses are assigned in a secondary area of emphasis.

Students enter the Doctoral Program with a Master's degree in a science or engineering field, or with 30 semester hours of graduate coursework. In the first year of residence, a Diagnostic Examination is conducted to evaluate this previous work. If they have not already done so in their previous work, all Doctoral students must take two engineering courses; two or three science courses (two if their prior training is in science, three if in engineering or another non-science field); and one course in policy or planning. The student's supervising committee must approve all courses taken to meet these requirements. All courses taken for credit towards the degree program must be taken for a grade of A-F where that is an option.

Students may choose among any of the five participating units for their primary and secondary areas of emphasis. Course selection within these areas of emphasis must result in a cohesive program that supports the dissertation research. If Civil and Environmental Engineering is chosen as an area of emphasis the assigned courses may include CE 5321 Engineering for Environmental Scientists, CE 5318 Physical-Chemical Processes I, CE 5319 Physical-Chemical Processes II, CE 5325 Biological Processes, CE 5320 Solid Waste Management, CE 5328 Air Pollution Control, CE 5329 Environmental Risk Based Corrective Action, or CE 6324 Dispersion Modeling.

Committees

The following is a description of the requirements and responsibilities of the committees established for Ph.D. students. A minimum of five faculty members must serve on any committee, and in some cases more will be needed to ensure adequate supervision of a student's program. It is highly recommended, although not required, that the three committees include the same five faculty members. Retaining the same faculty members on all three committees will ensure continuity of advisement, direction and design of a student's program and dissertation

research. All faculty serving on the committees described below must be Full or Associate members of the Graduate Faculty of the University. At least three members of the committee must be Full or Associate members of the Graduate Faculty of the Program in Environmental and Earth Sciences, and at least two members must be from a department outside that of the student's supervising professor. Outside examiners from institutions other than UTA may serve as a sixth (or more) member of a committee, but their participation must be approved by the Graduate Dean.

Initial Committee

The student, in consultation with the supervising professor, should establish an initial committee consisting of the supervising professor and four faculty members. This committee is responsible for the diagnostic evaluation (described below) and advisement. The student's supervising professor must notify the Graduate Advisor when the committee is established.

Examining Committee

Following the diagnostic evaluation, an examining committee will be assigned to the student by the Graduate Dean on the recommendation of the Graduate Advisor and Graduate Studies Committee. The committee will consist of at least five members from The University of Texas at Arlington, all of whom must be Full or Associate Members of the graduate faculty. In cases where substantial work is required in a separate area(s) or minor(s), at least one member must represent that area. The student should consult with the supervising professor in order to determine appropriate faculty members to serve as the examining committee. The student or supervising professor should contact each faculty member and determine that the individual is willing to serve as a committee member. The supervising professor should formally notify the Graduate Advisor, in writing, of the committee makeup when it is established. The Graduate Advisor will then seek approval from the Graduate Studies Committee and forward the recommendation to the Graduate Dean for his approval. The examining committee determines how the student has met or will meet the language requirement, is responsible for design and direction of the student's program, and conducts the comprehensive examination (described below).

Supervisory Committee

On passing the comprehensive exam, the supervisory committee must be established. It must consist of at least five members, all of whom must be Full or Associate Members of the graduate faculty. Generally, the members of the examining committee continue as the supervisory committee, but supervisory committee membership may be expanded or altered to accommodate the dissertation research needs of the student. If the supervisory committee membership is altered from that of the examining committee, the Graduate Advisor must be notified in writing so that approval of the Graduate Studies Committee and Graduate Dean can be obtained. The supervisory committee approves the student's dissertation and conducts the dissertation defense. If for any reason the membership of the Supervisory Committee must be changed after it has been established, the change must be made by notifying the Graduate Advisor.

Evaluations and Examinations Required of Doctoral Students

Diagnostic Evaluation

During the first year of doctoral work, but no later than the first 18 hours of coursework beyond appropriate master's level coursework or the equivalent, the student must demonstrate the potential to pursue and successfully complete the doctoral degree program. The primary goal of this evaluation is to identify coursework that will be necessary for the student to perform their research and meet other professional goals. The evaluation is a meeting of the student's committee with oral questions, but can also include a written examination, personal interviews with faculty members, successful completion of certain courses in the first semester of residence, or any combination of these methods. The result of the evaluation may be (a) approval to continue in the doctoral program, (b) approval to continue with specified remedial work, (3) failure followed by reassessment through a second diagnostic evaluation after a specified period, or (d) failure and dismissal from the program. The supervisory professor must notify the Graduate Advisor, in writing, of the results of the evaluation. The diagnostic evaluation report must be filed in the

Graduate School by the Graduate Advisor no later than the completion of the first 18 hours of doctoral coursework.

Comprehensive Examination

Eligibility for the Comprehensive Examination

The student is eligible to take the comprehensive examination after providing evidence to the examining committee of adequate academic achievement by having completed all or most of the coursework requirements as set forth by the examining committee including (a) all leveling work specified as a result of the diagnostic evaluation, if any, (b) any deficiencies lacking at the time of, but required for, entrance into the program, and (c) the language requirement. The comprehensive examination usually marks the end of formal coursework and the beginning of concentrated work on the student's dissertation research. The student must be enrolled in the Graduate School in the semester in which the comprehensive exam is held. **The comprehensive examination is not a diagnostic exam.** During the comprehensive exam, the student must convincingly demonstrate that he/she has gained, through coursework and directed or independent study, a knowledge and understanding of the theory and principles of the work underlying the field in which the dissertation work will be undertaken.

Scheduling the Comprehensive Examination

The comprehensive examination is scheduled by filing a Request for the Comprehensive Examination with the Graduate School. The Request for the Comprehensive Examination must be filed at least two weeks prior to the date on which the examination is to be held, and must contain the time, place and form (written or oral) of the examination. Each member of the examining committee indicates approval of the scheduling and agrees to participate by signing this "Request". The Graduate Advisor files the request. The student or supervising professor must initiate scheduling by notifying the Graduate Advisor of the intent to hold the examination. The student must complete the "Request" and gather all signatures. The completed "Request" must be returned to the Graduate Advisor with sufficient lead time to permit filing of the document in the Graduate School so that the two week pre-notification requirement is met.

Format of the Comprehensive Examination

The comprehensive examination is an oral exam conducted by the examining committee, but open to all faculty members. The examination focuses on knowledge in those areas necessary for the student's dissertation research and, ultimately, the student's profession. The student is expected to prepare a dissertation research proposal containing sufficient detail to allow the supervisory committee to evaluate the scientific merits, feasibility of completion, and the candidate's understanding of and ability to apply proposed data gathering techniques. After presenting the proposal, the student is first questioned by the examining committee and then entertains questions from any other faculty present. After questioning is completed, the student is excused and the examining committee then assesses the candidate's performance. Other faculty members present may discuss their assessments of the student's performance with the examining committee members, but the examining committee makes the ultimate determination of the student's performance. The committee may judge that the student (a) passed unconditionally; (b) passed conditionally upon meeting specified additional requirements; (c) failed, with permission to retake the exam after a period specified by the examining committee; or (d) failed with recommendation that the student not continue in the program. If major changes in the doctoral candidate's research are necessary after the Comprehensive Examination, the Supervisory Committee must be notified (individually or in a committee meeting) and must approve the changes. Members of the Supervisory Committee indicate their approval of changes by signing a form available from the Graduate Advisor. The signed form and a brief description of changes in the dissertation research must be filed with the Graduate Advisor.

Report of the Comprehensive Examination

The Report of the Comprehensive Examination must be signed by each member of the examining committee and the Graduate Advisor and filed in the Graduate School within 5 days of the examination, irrespective of the outcome. Filing the report is the responsibility of the Graduate Advisor.

Admission to Candidacy for the Doctoral Degree

Upon passing the comprehensive examination the student becomes eligible for admission to candidacy for the doctoral degree. Admission to candidacy requires that the student file The Application for Candidacy with the Graduate School for approval by the Dean of the Graduate School at least one semester prior to awarding of the degree.

Continuing Enrollment

The Graduate School has a continuing enrollment requirement. Graduate students must enroll for at least one credit hour of coursework, seminar, research or independent study during the fall and spring semesters. Exceptions are allowed only if the student requests and is granted a Leave-of-Absence through the Graduate School.

Dissertation

The dissertation represents the culmination of the Ph.D. candidate's academic effort. As such, the dissertation is expected to demonstrate original and independent research and should represent a significant scientific contribution. The dissertation research is directed by the supervising professor with advice and counsel from the supervisory committee. When completed, the dissertation must be approved by the supervising professor. A copy of the dissertation must then be provided to each member of the supervisory committee for their evaluation. After approval by the supervisory committee, the dissertation may be presented to the Graduate School for the required mechanical check. The mechanical check determines that the structure of the dissertation (margins, neatness, correlation of page numbers in the Table of Contents with numbers in text, etc.) meets the requirements set by the Graduate School. Mechanical errors must be corrected before the dissertation will be accepted. All dissertations must comply with the requirements set forth in the current edition of *Thesis and Dissertation Manual of Style*. The Graduate School sets deadlines for submission of the dissertation for the mechanical check and for submission of the final copies of the approved dissertation (i.e. copies incorporating corrections required by the Graduate School and meeting the approval of the supervisory committee as indicated by their signatures on the appropriate page of the dissertation). Deadlines for submission for the mechanical check and deposit of the three unbound copies are printed in the Graduate Catalog.

The Assistant Dean of the Graduate School examines each dissertation and determines whether or not the dissertation meets Graduate School requirements for format and mechanical presentation. To reduce the number of last minute inconveniences, the student must submit the master copy of the final draft of the dissertation for mechanical check before making additional required copies. The master copy must be received for the mechanical check no later than one week in advance of the final deadline for submitting the required three copies of the approved dissertation to The Graduate School to allow at least three days for Graduate School examination, time for corrections, and time to make required copies. After the Graduate School receives the master copy of the final draft, the student will be given a written format evaluation 72 hours later (excluding weekends, holidays, and graduate registration periods).

Each semester the Graduate School offers the opportunity to attend a seminar on thesis and dissertation preparation. The requirements described in the *Thesis and Dissertation Manual of Style* are explained, and general Graduate School procedures of particular importance to degree candidates are outlined. The Graduate School notifies the Graduate Advisor of the dates of the seminar and students should obtain information on these dates from him/her. Seminar times and dates also can be obtained from the Graduate School.

Final Semester Procedures

During the final semester of doctoral studies there are numerous procedures, forms, and deadlines to deal with. Students must complete the dissertation, schedule and pass a dissertation defense, submit the final dissertation document, register for the dissertation course, apply for graduation, demonstrate that all program requirements have been met, and pay a number of required fees.

Final Degree Plan Worksheet

The Final Degree Plan Worksheet is prepared during the student's last semester, when all courses have been

completed or are in progress, and the final program defense and graduation are anticipated. The Final Degree Plan Worksheet must list all courses taken to satisfy the degree requirements and any other requirements set by the supervisory committee. The Final Degree Plan Worksheet requires the signature of each of the supervisory committee members, the Chairman of the Graduate Studies Committee in Environmental and Earth Sciences and the Graduate Advisor. The student must allow sufficient time for completing the form and obtaining signatures. Before preparing the Final Degree Plan Worksheet, the student should obtain a current GMAP form from the EES Department Office. Classes entered on the Degree Plan Worksheet to fulfill particular degree requirements should agree with the same designations on the GMAP form. Any discrepancies should be resolved in consultation with the Graduate Advisor. The Dissertation Defense is also scheduled and taken during the final semester, and must be scheduled in advance through the Graduate School. The results of the defense or examination must be reported to the Graduate School on the required form by the required deadline for the semester. Students must also file an Application to Graduate by the required deadline for the semester. Students in their final semester should consult the graduation checklist on the Virtual Advisor link of the Graduate School Web Page for forms and deadlines.

Dissertation Defense

A final Dissertation Defense examination is required of all doctoral degree candidates. The candidate must provide a completed copy of the dissertation to each member of the supervisory committee two weeks prior to the scheduled defense. At least one week prior to the defense, a copy of the dissertation must be given to the graduate advisor so that interested faculty and students may read the work.

Scheduling the Dissertation Defense

The dissertation defense is scheduled by filing the Request to Hold the Dissertation Defense (Final Doctoral Examination) with the Graduate School. The form is filed by the Graduate Advisor. The Request to Hold the Dissertation Defense (Final Doctoral Examination) must be filed at least two weeks prior to the defense date, but not later than three weeks prior to the final deadline set by The Graduate School, for the applicable semester, for submission of approved dissertations and dissertation defense reports. The request must contain the time, location, and type (i.e. written or oral) of exam, and must be signed by each member of the supervisory committee and the Graduate Advisor. The defense must be held on the date requested, but not later than the date set by the Graduate School as the final date to hold the exam for the applicable semester. In the event that a defense is canceled, postponed, or results in the requirement of a re-examination (see below) a new "Request" must be filed to reschedule the defense. All members of the supervisory committee must be present before the exam may proceed.

Format of the Dissertation Defense

The dissertation defense consists of an oral presentation of the dissertation research and content. The format of the defense is prescribed in the Graduate Catalog. "The dissertation defense will be a public, oral examination open to all members (faculty, students and invited guests) of the University community. The questioning of the candidate will be generally directed by the student's dissertation committee, but any person attending the defense may participate in the examination."

The defense is concerned primarily with the dissertation research and content, but the committee may explore the candidate's knowledge of areas related to the core of the dissertation research. The candidate first entertains questions relating to the dissertation work from the general audience (faculty, students, guests), after which students and guests are excused and the candidate is questioned by the supervisory committee and other attending faculty. After questioning by the committee, the student is excused and the committee evaluates the candidate's performance. All faculty members present may express their opinion of the candidate's presentation and their judgment of the overall acceptability of the candidate's defense to the supervisory committee members. The committee is, however, the ultimate judge of the acceptability of the candidate's defense. The dissertation defense may result in a judgment that the candidate (a) passed unconditionally; (b) passed conditionally upon meeting specified additional requirements; (c) failed with permission to retake the defense after a period of time specified by the supervisory committee; or (d) failed and is dismissed from the program.

The dissertation must be unanimously approved by the supervisory committee, as indicated by their signatures on the appropriate page of the dissertation, and by the Dean of the Graduate School.

Dissertation Defense Report

A Dissertation Defense Report indicating the results of the defense must be filed in the Graduate School no later than five working days after the defense, irrespective of the outcome. Preparation and filing of the report is the responsibility of the Graduate Advisor.

Time Limit

All requirements for the doctoral degree including the Dissertation Defense must be completed within four years after passing the comprehensive examination.

Additional Requirements for Graduation

Once enrolled in the dissertation course, EVSE 6399-6999, the student must maintain continuous enrollment (enroll for dissertation each semester) until graduating. In the semester in which the dissertation requirements are met and the student anticipates graduation, the student must (a) be enrolled for 9 hours of dissertation, EVSE 6999, (b) file an Application for Graduation with the Graduate School, and (c) pay the Diploma Fee. The Application for Graduation must be filed with and the diploma fee paid in the Graduate School no later than the final date to file the Application for Candidacy and Degree Plan Worksheet for the applicable semester. If a student does not graduate in the semester in which an Application for Graduation is filed and a diploma fee is paid, he/she must again file for graduation and pay the diploma fee in any subsequent semester in which graduation is expected. Students in the doctoral program must pay the required fees for processing the dissertation document

Miscellaneous

Graduate Student Grievances

Grievances involving grades in graduate courses should be resolved between the faculty member and the student where possible. If an agreeable resolution cannot be reached between the two parties and if a student wishes to appeal a decision relative to a grievance, a Request to Appeal (form available in the departmental offices) should be submitted to the Program Director. The Program Director will forward the form to the program's Student Grievance Committee (i.e. the EES Graduate Studies Committee). If a student is dissatisfied with the decision of the Grievance Committee, they may appeal first to the Program Director, then to the Dean of the College of Science and finally to the Provost. The decision of the Provost is final.

For grievances other than course grades, it is the obligation of the student to make every effort to resolve the matter with the individual with whom the grievance originated. If a satisfactory resolution cannot be arrived at, the student may appeal to the Graduate Advisor and/or Program Director. The Graduate Advisor and/or Director may then bring the matter to the attention of the program's Graduate Studies Committee. If the student is dissatisfied with the decision made, they may first appeal to the Dean of the Graduate School, the Vice President for Business Affairs or the Vice President for Student Affairs, depending on the nature of the grievance. If the matter remains unresolved, the student may appeal to the Provost. The decision of the Provost is final.

Petitions

A petition allows students to request exceptions to university and departmental rules. The petition must explain the basis for the requested exception and must be submitted to the Graduate Advisor. Exceptions may be allowed if the facts presented in the petition fully justify the exception. The petition must be approved by the Graduate Advisor, Graduate Studies Committee, and ultimately the Dean of the Graduate School. All petitions must be submitted on forms available from the Graduate Advisor or Graduate School Office. Special forms are available for withdrawal and *in absentia* registration in the Graduate School Office. The EES Graduate Advisor should always be consulted by students who are considering filing a petition.

Withdrawal

A student who wishes to withdraw voluntarily from the University before the midsemester drop date must file the proper resignation form in the Office of the Registrar. After midsemester, a student in a graduate course is

not permitted to withdraw or drop selected courses, however, in exceptional cases, a student may submit to the Dean of the Graduate School a Petition to Withdraw After Midsemester. If the petition is not approved, the student remains responsible for all course requirements. **Do not stop attending classes until the petition is approved.**

In Absentia Registration

Any student who completes all requirements for graduation (i.e. thesis defended and approved and deposited with the Graduate School), but failed to meet the Graduate School deadline for graduation in the semester in which the requirements were met may register *in absentia*. Permission of the Graduate Advisor and the Graduate School is required. The student may not enroll in courses but must pay the cost of *in absentia* registration, file an application for graduation, and pay the diploma fee for the semester of graduation. The Request to Register *In Absentia* form is available from the Graduate School.

Termination

Students have the initial responsibility to recognize when they are having academic difficulties and are expected to initiate steps to resolve the problem. When a student is in academic difficulty, and dependent upon the severity of the problem, the student may receive an oral warning and/or written statement of the problem and required corrective actions. Failure to take these corrective actions can result in termination from the degree program.

A graduate student whose grade point average in all graduate courses taken while enrolled as a UTA graduate student falls below 3.00 will be placed on academic probation. The student must attain a grade point average of at least 3.00 in the next semester he or she is enrolled or be subject to dismissal. Undergraduate courses or graduate courses graded P, R, X or W cannot be used to remove the condition of academic probation.

A student who has been dismissed from the Graduate School for failure to meet the 3.0 grade-point average requirement may be readmitted for further graduate study in the same or in a different program only if a Petition to the Graduate Faculty has been approved by the appropriate Committee on Graduate Studies and the Dean of Graduate Studies

A student can be dismissed from a degree program not only for failure to maintain an adequate grade point average, but also for such reasons as unsatisfactory progress toward a degree as defined by the department or program, inability to pass a diagnostic or comprehensive examination, failure to prepare or to defend a thesis or dissertation in a satisfactory manner or complete thesis or dissertation work in an acceptable amount of time.

Students failing to pass a diagnostic/comprehensive examination or thesis/dissertation defense may be terminated upon the recommendation of the examining committee. Such decisions are indicated on the Diagnostic Evaluation Report, Comprehensive Examination Report or Final Defense Report which are returned to the Dean of Graduate Studies. The Graduate Dean will notify the student formally of the program's or department's decision.

Termination due to inadequate academic progress is a decision made by the program's or department's Graduate Advisor and Graduate Studies Committee. A student's thesis/dissertation committee may recommend termination for failure to prepare a thesis/dissertation proposal, prospectus or final draft in a satisfactory manner or failure to complete work in an acceptable amount of time to the program's Graduate Advisor and Graduate Studies Committee. Such decisions to terminate a student must be communicated to the Dean of Graduate Studies by the Chairman of the Graduate Studies Committee in writing giving the specific reasons involved, all warnings provided to the student, a description of the procedures and actions leading to the recommendation and the recorded votes of the Graduate Advisor and Graduate Studies Committee. The student may appeal his or her termination to the Dean of Graduate Studies in writing within one year of the date of the decision by the Graduate Advisor and Graduate Studies Committee. The student may continue enrollment during the termination process

GRADUATE ASSISTANTSHIPS, FELLOWSHIPS AND FINANCIAL AID

Graduate Research Assistantships

Students may receive financial support in the form of Graduate Research Assistantships (GRA) from the research grants of their faculty Masters or Ph.D. supervisor. A Graduate Research Assistant earns this support by conducting grant-supported research in the laboratory of their graduate supervisor. The amount of GRA support varies among laboratories, but generally ranges from \$1000-1500 per month. GRA support is generally only awarded to students who have been accepted into the laboratory of their chosen supervising professor and who are actively carrying out their thesis or dissertation research.

Graduate Teaching Assistantships

A limited number of Graduate Teaching Assistantships (GTA) are available to students in the Environmental and Earth Sciences Program. They are awarded on a competitive basis. Graduate Teaching Assistants are usually assigned to teach undergraduate course laboratory exercises. A Graduate Teaching Assistantship (GTA) may be offered to Environmental and Earth Sciences Students through the home department of their thesis or dissertation supervising professor (i.e., Biology, Civil and Environmental Engineering, City and Regional Planning, Chemistry and Biochemistry, and Geology). The usual GTA teaching load is 6-9 hours per week and consists of teaching three to four two-hour laboratories or two to three three-hour laboratories. However, teaching loads may be altered when warranted by departmental circumstances. Teaching assistants must set aside four hours per week for office hours. Additionally, teaching assistants are periodically assigned as proctors for exams in larger lecture undergraduate course sections. Proctoring assignments may be for lectures in which the TA teaches labs, or for non-associated lectures. A GTA generally provides a student with \$1000-1500 per month in financial support depending on the Department in which they are teaching. A GTA is generally not assigned to a student until after they have been accepted into the laboratory of their thesis or dissertation supervising professor. A GTA is not usually available to students seeking a nonthesis Masters degree in Environmental and Earth Sciences.

The teaching assignments of a GTA are determined by the departmental chair, graduate advisor and lab coordinator/supervisor. Notification of assignments is made about one week prior to the beginning of each semester. Assignments can and do vary from one semester to the next as course and laboratory offerings vary. Teaching assistants are required to administer a student evaluation in each lab taught. Evaluations must be turned in to the appropriate lab coordinator/supervisor or faculty member who will then discuss evaluations with the teaching assistant.

Graduate Teaching Assistants play an important role in undergraduate education. A GTA is a representative of the University and is responsible for creating a positive educational experience for students in the classroom. In addition, the experience acquired through teaching is a significant component of graduate education.

The duties and responsibilities of Graduate Teaching Assistants usually include:

- 1) assisting the professor teaching the course as needed and assigned (this may include attending weekly GTA meetings to discuss the material to be covered in the lab and setting up schedules for turning in grades to the professor);
- 2) working with other GTA's and faculty during late registration and drop-add prior to each semester,
- 3) regular clean-up and preparation of laboratory areas (particularly important at the end of each semester),
- 4) setting reasonable office hours and being available to students who have questions,
- 5) providing adequate safety instruction for students in the laboratory and adequate security for equipment and supplies in the laboratory,
- 6) efficient organization, preparation and instruction of laboratories and laboratory exams.

A handbook explaining many aspects of Graduate Teaching Assistantships is available at the Graduate School web site (<https://grad.uta.edu/pdfs/faculty/GTA%20Handbook.pdf>).

University Administered Financial Support

The University of Texas at Arlington has a number of forms of financial aid available to graduate students.

Information on these programs is available from the Financial Aid Office, located in Suite 252 Davis Hall, phone: 817-272-3561. Information is also available on the Financial Aid website at www2.uta.edu/fao/. Some of the available forms of financial aid for Graduate Students include:

Scholarships

The University of Texas at Arlington provides a variety of scholarship programs for graduate students who have demonstrated exceptional academic achievement. They are awarded on the basis of scholastic excellence and adequate preparation for graduate study in a student's chosen field. Students can contact the Program in Environmental and Earth Sciences, Graduate Adviser, Dr. Andrew Kruzic (e-mail: Kruzic@uta.edu) in order to obtain the latest information on available scholarships in the EES program.

Alumni Loan Fund

Provides students with loans of up to \$500.

Federal Perkins Loan and Federal Stafford Loan

Provides long-term student loans, allowing deferred repayment until after termination of studies (limited to U.S. citizens or students on other than temporary visa status).

Federal Work-Study Program

Provides part-time employment in various university departments and certain approved off-campus agencies (award is based on need).

Financial Counseling

The Financial Aid Office provides financial or budgetary counseling for any student regardless of whether they qualify for other types of assistance.

Out-of-State Assistance

Several states offer aid to their students attending schools in other states. Information on these programs is available from the Financial aid Office.

Veteran's Assistance

The Registrar's Office can provide information on Veteran's Administration (VA) benefits for students planning to attend or attending the University.

FUNDING OPPORTUNITIES FOR GRADUATE STUDENTS

Outlined below are some sources of extramural funding which have traditionally been pursued by graduate students early in their careers at UTA. Other avenues of funding are available (some are specific to a student's research area), and each student should discuss his/her funding needs and possibilities with their supervising professor. International students are often eligible for a wider array of grants and should consult their supervising professor and the Office of Sponsored projects for this information. Graduate students are encouraged to apply for research funding to gain experience in applying for extramural grants that will be useful later in their careers and to lend some flexibility and independence to their research. Information on grants and fellowships can be obtained from the Office of Sponsored Projects (Rm. 201 Davis Hall).

Sigma Xi Grants

Sigma Xi, The Scientific Research Society, has provided grants in aid of research since 1922. These have typically been limited to \$1000 maximum and include funds for travel and subsistence, and supplies but not equipment or salary. The grant proposal includes a brief description of the proposed research and a detailed budget. Three letters of recommendation are also required. There are three deadlines each year for these grants (one in October or November, one in January or February and one in May). Application materials for this and other grants can be obtained through the Office of Sponsored Projects in Davis Hall.

National Science Foundation Dissertation Improvement Grants

Dissertation Improvement Grants are awarded by NSF to Doctoral students working on their dissertations. They are submitted to the appropriate program area of NSF and are reviewed by three to five scientists working in the subject area of the proposed research. These grants are available in larger dollar amounts (limited to \$10,000 total) than most other grants available to graduate students and are highly competitive. These grant proposals involve a 15 page maximum research proposal with sufficient detail to allow reviewers drawn from a national pool of scientists specific to the research area to assess the importance and feasibility of the proposed research. These grant proposals must be submitted with the supervising professor as a Co-Principal Investigator. A more in depth application is required for these grants and the application booklet including the forms can be obtained through the Office of Sponsored Projects.

National Science Foundation Graduate Research Fellowship

These fellowships are intended for students at or near the beginning of their graduate career. They must be applied for during the first semester as a graduate student (having completed fewer than 20 semester hours of graduate courses). They are limited to three years of support for research leading to a Ph.D. and include a 12 month stipend. They are awarded on the basis of academic record (GPA), GRE scores and letters of recommendation. Applications are reviewed by a panel of scientists from the National Research Council and awards are given on the basis of merit. These fellowships are highly competitive and women, minority students and persons with disabilities are encouraged to apply. Incoming graduate students should discuss the possibility of applying for this fellowship with their initial faculty sponsor or the graduate advisor. The application materials are available from NSF and the Office of Sponsored Projects.

EPA STAR Fellowships for Graduate Environmental Study

The EPA Science to Achieve Results (STAR) program funds graduate fellowships to support masters and doctoral students in environmentally related fields of study. About 100 fellowships are funded annually across the nation. The application deadline is usually in November, and announcements and application instructions are posted at the EPA web site in August or September (<http://es.epa.gov/ncerqa/fellow/>). In 1999, each fellowship offered a \$17,000 annual stipend, \$5,000 per year for expenses such as health insurance fees, books, supplies, equipment, and travel to scientific meetings, and tuition support up to \$12,000 per year. Fellowships for master's students may run up to 2 years, those for Ph.D. students up to 3 years. Applications may be submitted before enrolling in a graduate program, but students must be officially enrolled to begin receiving benefits. Master's students may not apply if enrolled for more than 2 years in a program; and Ph.D. students may not apply if enrolled for more than 4 years in a

program. Only U.S. citizens or permanent resident aliens are eligible for these fellowships. Fellows are required to attend the annual EPA STAR Graduate Fellows Conference, usually in June. Students seeking these fellowships must submit a pre-application which summarizes: transcript information, relevant experience, career and research goals, and the thesis or dissertation project to be undertaken. Pre-applications are reviewed for merit, and a pool of finalists is selected based also on EPA program goals such as balance among fields of study. Further information is then requested from finalists, and final award decisions are made by June of the following year.

EPA National Network for Environmental Management Studies (NNEMS)

The EPA offers fellowships through this program to both graduate and undergraduate students. Undergraduate students who are graduating may apply if they are admitted to a graduate program. Applicants must be U.S. citizens or permanent residents. Students in this program work on specific research projects for the EPA, and projects are designed to be achieved during summer or part-time during the academic year. All fellowships are paid and stipends vary depending on the student's level of education, and the nature of the research project. Some projects are conducted at EPA facilities or other locations, while some can be conducted at the student's academic institution. Travel or training expenses necessary to the research project are also provided. Program descriptions and lists of available projects can be found at <http://www.epa.gov/enviroed>.

TXU Environmental Research Fellowships

TXU, the major electric power generating utility in North Central Texas, awards research fellowships to masters and Ph.D. students on a competitive basis. These awards are made to students whose thesis or dissertation research is focused on assessment, control or abatement of the environmental impacts of TXU operations including strip mining, thermal effluents, and reclamation of mined lands. In order to apply, a student must be accepted into the laboratory of a supervising professor and present a minimum combined GRE score of 1100. Students are required to submit a detailed research proposal to a review committee that is made up of environmental scientists from academic and research institutions in Texas and surrounding states. The fellowship provides a competitive monthly stipend, funds to support graduate research and travel funds to scientific meetings. Two years of funding are offered to masters students and three years of funding to Ph.D. students. Funding periods may be extended with approval of the TXU review committee. Fellowship funds are administered by the student's supervising professor. Proposals are accepted throughout the year. However, they must be received no later than April 1, July 1 and November 1 to be considered by the review committee at its spring, summer and winter meetings, respectively. The application instructions are available from the Director of the Program in Environmental and Earth Sciences. Students interested in applying are encouraged to discuss this with their major professor and the program advisor as they begin to work on the proposal.

American Water Works Association

The American Water Works Association offers several fellowships, scholarships and grants for students pursuing research and training in areas related to water supply and treatment. The Abel Wolman Fellowship supports doctoral students and offers up to \$20,000 for one year, and can be renewed for a second year. The Larson Aquatic Research Support Scholarship supports doctoral and master's students interested in fields of corrosion control, treatment and distribution of water supplies, and aquatic and environmental chemistry. It gives \$5,000 one-time grants to master's students, and \$7,000 one-time grants to doctoral students. The Camp Memorial Scholarship supports students doing applied research in the drinking water field. Awards consist of a \$5,000 one-time grant, and are given to doctoral students in even years and to master's students in odd years. The Holly Cornell Scholarship supports outstanding female or minority master's students pursuing advanced training in water supply or treatment. It offers a \$5,000 one-time grant. The Academic Achievement Award is a prize offered to recognize academic excellence and research contributions by graduate students in fields relevant to public water supply. It is based on the student's thesis or dissertation, which must be submitted for judging in the year in which it is submitted for the degree. Awards up to \$3,000 are given. Applications for most awards are due in January. Further information and applications may be obtained at www.awwa.org/tande/scholar.htm.

Phi Sigma Grants

The biology graduate student honorary scientific society, Phi Sigma, typically offers student research grants on a competitive basis. Several grants of up to \$500 are usually available each semester. No one may receive more than two grants during his or her stay at UTA. Funding of a second Phi Sigma grant is, in large part, dependant upon demonstrated productivity from the first. Details regarding the grant process, limitations, and requirements for a particular semester are posted in the Phi Sigma room and the Department of Biology office at least two weeks prior to the grant deadline for that semester. The format of the grant proposal includes a brief description of the proposed research and a detailed budget. A student must be a member of the society to apply for a grant. Regular attendance at Phi Sigma meetings provides Phi Sigma members with prior warning of upcoming grant deadlines and procedures. Other similar grants through graduate student research societies in specific research fields may be available to EES students. They should confer with their supervising professor regarding the availability of such grants to support their graduate research.

Student Conservation Association Internships

Internships are offered as part of the AmeriCorps Service program for 12 weeks to 12 months at various locations with various agencies, including many of the federal regulatory and environmental agencies. Interns are assigned various duties with the sponsoring agencies. Expenses are paid, and interns are eligible for educational grants of up to \$4725. Total expenses and grants vary with length location of the internship. Applicants must be high school graduates, and need not be enrolled as students during the time of their service. Applicants for internships longer than 16 weeks must be U.S. citizens. Applications are processed five times a year and are available at <http://www.sca-inc.org>, and internship periods commence at various times.

MENTORING PROGRAM

The program in Environmental and Earth Sciences has an external Advisory Council composed of respected environmental professionals in the North Texas region. Many of the council members are willing to mentor graduate students in the program. The one-on-one mentoring program within the Environmental and Earth Science Program is designed to provide valuable opportunities for growth and learning for both the protégé and the mentor outside of the traditional classroom learning environment. The one-year program provides an opportunity to enhance skills, explore career opportunities and ideas and to begin or enhance the establishment of a network of colleagues. Students who are interested in the mentoring program should download the Mentoring Program Guidelines (pdf format), and fill out the application form and mail it to the Program Director.

STUDENT ORGANIZATIONS

Organizations of Interest to Students in Environmental and Earth Sciences

Students in Environmental and Earth Sciences may also wish to join other student organizations focused in their particular area of interest in environmental studies. These organizations are associated with the various departments and units comprising the Program in Environmental and Earth Sciences and include:

American Society of Civil Engineers (ASCE)

The American Society of Civil Engineers is an organization for students with career interests in civil and environmental engineering. Contact the Department of Civil and Environmental Engineering for more information on this society.

Biological Society

The Biological Society is an organization for all biology majors, minors and everyone interested in biology. The Biological Society was established over 23 years ago, making it one of the oldest organizations on campus, and the oldest society within the College of Science. Weekly meetings feature speakers such as biology professors, local employers and respected biologists in the field. The Society also sponsors regular field trips to Beavers Bend, Big Bend, and Port Aransas. Additionally, study groups for almost every class can be found listed in our office. As students approach graduation, the Society assists them by providing information about various graduate schools, the application process, and programs of study offered. The Society's office door (room 127 Life Science Building) is always open, so come by anytime and join! All students are welcome at our Monday noon meetings, usually held in room 124LS.

Chemistry and Biochemistry Society of UTA

The Chemistry and Biochemistry Society of UTA is an organization for students interested in Chemistry and Biochemistry including Environmental Chemistry. The Chemistry and Biochemistry Society acts as a center for networking between students and faculty to offer extensive programs that help students academically. The Society also sponsors many fun and entertaining activities to create a relaxing social atmosphere.

Pi Alpha Alpha

Pi Alpha Alpha is the prestigious national honor society for public affairs and administration. PAA holds both a leadership training conference and a competition for best student paper in the field, annually. The chapter at UTA sponsors officer attendance at the conference, and it organizes and sponsors activities for its members that provide hands-on experience and networking opportunities in public administration. Membership is limited. For more information, contact Faculty Advisor Dr. Guisette Salazar, at (817) 272-3302 or salazar@uta.edu.

Phi Sigma Society

The Phi Sigma Society is a national graduate student honor society for the promotion of research in the Biological Sciences. Membership in the UTA chapter is open to all biology and EES graduate students in good standing, and all incoming students are strongly encouraged to join and actively participate in the Society. Phi Sigma is currently the official means of graduate student input into Biology Department affairs (e.g., faculty candidate searches). Every semester the Society offers small research grants on a competitive basis (see below). Phi Sigma also sponsors an active seminar series which brings to UTA quality speakers involved in current research in areas of graduate student interest. In addition, the society funds and organizes several social events throughout the year that serve to increase interaction among graduate students and between students and faculty. Membership in the society has traditionally required a \$50 application fee. Benefits include lifetime membership, a one-year subscription to Bioscience, free attendance at Phi Sigma functions, and perhaps most importantly, the eligibility to receive research grants through the Society. Phi Sigma generally holds a meeting early in each Fall semester, and then throughout the year as needed. All graduate students are encouraged to make an effort to attend Phi Sigma meetings and find out more about the graduate student organization.

Sigma Gamma Epsilon, Beta Omega Chapter

Sigma Gamma Epsilon is an organization for students interested in the geosciences including environmental geology. Contact the Department of Geology for more information on this organization.

Student Planning Association

The Student Planning Association is a multilateral organization of students from the planning, urban affairs and public administration programs at the School of Urban and Public Affairs. It holds monthly meetings, sponsors professional speakers and events, usually related to planning issues, and offers limited financial aid for students to attend professional conferences. It also organizes and sponsors social activities.

Graduate Student Awards

Award for Outstanding Master's Student in Environmental and Earth Sciences

An award is given annually for outstanding achievement by a Master's student in the Program in Environmental and Earth Sciences. Students are nominated for this award by the EES faculty and nominations are reviewed by the EES Graduate Studies Committee.

Award for Outstanding Doctoral Student in Environmental and Earth Sciences

An award is given annually for outstanding achievement by a Master's student in the Program in Environmental and Earth Sciences. Students are nominated for this award by the EES faculty and nominations are reviewed by the EES Graduate Studies Committee.

FACILITIES

The Program in Environmental and Earth Sciences encompasses the facilities and teaching and research laboratories of its five major participating units including the Departments of Biology, Chemistry and Biochemistry, and Geosciences in the College of Science, Civil and Environmental Engineering in the College of Engineering and the Department of City and Regional Planning in the School of Urban and Public Affairs. A graduate student in the Environmental and Earth Sciences has access to the facilities of all of these departments in their studies and graduate research. Below find a brief description of the facilities available in each one of the component units in the Environmental and Earth Sciences Program.

Department of Biology:

The Department is housed in the Life Sciences Building (LSB), where it occupies approximately 80,000 sq. ft. of floor space. There are 13 lecture rooms that hold 20 to 200 students, and 18 fully equipped teaching laboratories. Approximately 25 offices are available for graduate student use. In addition to individual research areas, faculty and staff offices and the departmental office, the department has a number of general use facilities which support teaching and research. These include:

Genome Biology Facilities

Core facilities for genomic analysis include an ABI PRISM® 3100xl Genetic Analyzer for sequencing, a GeneChip® Scanner 3000 7G for reading microarrays, a GenePix Professional 4200A Four-color scanner for fluorescent imaging, an Agilent 2100 Bioanalyzer Desktop System for microfluidics-based analysis of DNA, RNA, proteins and cells, and an ABI 7300 Real Time PCR System.

Animal Care Facilities

The department maintains facilities for small mammal and lower vertebrate care, and terrestrial invertebrate care in several rooms throughout the building. All of these rooms meet PHS guidelines for animal welfare. The small mammal facility located on the fifth floor has rooms complete with cages, racks and accessory equipment. Two separate facilities are available in the basement for housing aquatic and terrestrial lower vertebrates, complete with temperature and light control, dechlorinated water, and low-pressure air supply.

Greenhouse

Two greenhouses on the roof of the LSB provide living plant specimens for laboratory courses and house specimens for botanical research. The greenhouses are temperature controlled and automatically vented. Adjacent to the greenhouses are potting rooms and additional storage.

Plant Collection

The herbarium collection, located in the basement, houses over 7000 research specimens of vascular plants and algae in 25 Lane herbarium cabinets.

Electron Microscope Facility

The Department of Biology has an array of high magnification imaging and analysis equipment located in the basement Electron Microscope (EM) facility. Elemental localization and X-Ray analysis capabilities are also available. A confocal laser-scanning microscope is also available, with three-dimensional scanning and spectral characterization. A full-time staff member maintains the facility, and is available for research supervision. Graduate students wishing to use the EM facility for research are strongly advised to first take the EM courses offered, and to discuss their research plans with EM facility director.

Confocal Laser Scanning Microscope

A confocal laser scanning microscope (Zeiss Meta) is maintained adjacent to the Electron Microscope Facility. This microscope is capable of scanning specimens in three dimensions and recording visible fluorescence emission spectra for excitation wavelengths in the visual spectrum. Software for image and spectral processing is available.

Field Vehicles & Boats

The Department of Biology maintains vehicles for teaching and research purposes. Three boats are also available for research and teaching, a 16 ft. electroshocking boat for fish collecting, a 19 ft. bass boat, and a 12 ft. aluminum jon boat.

Machine Shop

Located in the basement of the LSB is a room dedicated to fabrication of equipment for research and teaching. Tools available for use by graduate students and faculty include a radial arm saw, table saw, drill press, air compressor, Maximat combination mill/lathe, and various other hand and power tools.

Environmental Chambers

Scattered throughout the building are 19 walk-in environmental chambers. Eight of these chambers operate only above ambient temperature; eight are refrigerated; three are large growth chambers that regulate light, temperature and humidity; one is a Kysor-Sherer refrigerated laboratory for experiments that require low, constant temperatures.

Department of Chemistry and Biochemistry

The Department of Chemistry and Biochemistry is located in Science Hall and several research groups have just moved into the new 55,000 square foot Chemistry Research Building dedicated exclusively to chemical research. The major research equipment available includes:

- Two multinuclear, superconducting FT-NMR spectrometers
- Two continuous wave NMR spectrometers
- DNA sequencing apparatus, centrifugal vacuum concentrator
- UV transilluminators
- Brookhaven dynamic light scattering apparatus;
- Excimer laser pumping state-of-the-art tunable dye laser
- A GC/MS/MS/DS triple quadrupole mass spectrometer
- FT-ICR mass spectrometer with a 3-Tesla superconducting magnet
- Single crystal X-ray diffractometer
- X-ray photoelectron, dielectric, Spex-Ramalog Raman, EPR, photoacoustic, GC-FTIR and fluorescence spectrometers
- Analytical and preparative gas and liquid chromatographs
- GPC with multi-angle laser light scattering detector
- UV/VIS/NIR spectrophotometers (some with diode-array detection)
- C/H/N analyzer;
- Mossbauer spectropolarimeter;
- Cyclic voltammetry and electroanalytical instruments
- Two complete thermal analysis units (with TGA, DTA, DMA, and DSC modules)
- Vapor pressure osmometers
- Jasco spectropolarimeter;
- Several fast reaction instruments (T-jump, laser E-jump, P-jump, flash photolysis and stopped flow apparatus)
- Rapid scan time-resolved spectrometer

- Thin film profilometer
- SGI O2, and IBM RS6000 models 595 and 390 computers
- SGI Indigo-2 high resolution graphics workstation
- Departmental graphics facility, with PC, Mac, film recorder, scanner, and color laser writer
- PC modeling lab, with Hyperchem and Chem Office
- Several dozen PCs and Macintosh computers
- Two liquid scintillation counters
- High-speed centrifuges
- Ultracentrifuge
- Incubators/shakers
- Solartron impedance analyzer

The Department has hot and cold rooms and maintains a fully equipped glass shop. Within Science Hall are well-equipped machine and electronics shops.

Civil and Environmental Engineering

The Civil and Environmental Engineering Department's environmental laboratory facilities are located in the basement of Nedderman Hall. The facilities include two medium-sized and one large research laboratory equipped with large fume hoods and two constant temperature boxes. Major equipment in the environmental labs include an ion chromatograph, an ammonia analyzer, several gas chromatographs, an atomic adsorption spectrophotometer, an electrolytic respirometer, and a microtox toxicity analyzer.

City and Regional Planning

The School of Urban and Public Affairs (SUPA), Program in City and Regional Planning, boasts state-of-the-art facilities for the study of environmental planning and policy. A variety of well-furnished seminar rooms are available to accommodate classes of varying sizes, and a full complement of audio-visual equipment is available for faculty and student use. Graduate research assistants have offices, along with SUPA faculty, staff, the Student Planning Association and the Center for Economic Development Research and Service. SUPA also has an on-site computer laboratory that contains advanced PCs for GIS and other computer applications with connections and access to hardware and software throughout the campus. SUPA's GIS and other computer classes also utilize the 21 state-of-the-art PCs, projector, printers and plotters in the University Computing Center at Ransom Hall. The University also offers UNIX-based SUN workstations and advanced PCs for GIS applications in other computer laboratories across campus.

Department of Earth and Environmental Science

The Department of Geology is housed in the Geosciences Building and has the facilities and equipment that is necessary for the support of research and teaching in geology. Facilities include:

- Thin section lab and saw room -- Laboratory spaces and equipment (saws, polishing laps, pressure impregnation equipment, heavy liquid separation, microscopes, *etc.*) for studies in stratigraphy, sedimentology, and sedimentary petrology
- Geochemistry laboratory for wet chemistry and AA analysis
- X-ray laboratory with XRD and XRF spectrometers
- Laboratory spaces equipped for the processing of micropaleontology samples
- Laboratory for the analysis of carbonate rocks (Jones and Kaiteris Carbonate Analysis Apparatus and associated equipment)
- Diffuse reflectance laboratory with a computer controlled Perkin-Elmer Lambda 6 Spectrophotometer
- Photomicrography laboratory with petrographic microscopes equipped for photomicrography and a fluid inclusion stage
- Computer laboratory with 8 networked PC workspaces, a digitizing tablet, a scanner, and a networked printer. The lab is used for training in geoscience computer applications and geographical information

systems (GIS).

Other valuable resources within the Department of Geology include:

- The Center for Electron Microscopy that is housed in the Life Sciences Building. The center has two SEM's (JEOL 35C and 300) and a STEM (JEOL 1200EX). All three are equipped with Link and Tracor Northern X-ray and image analysis systems. This facility is accessible to geology faculty and students
- A CAMECA electron microprobe that is housed in the Geosciences building and is operated by the Material Sciences Department. This facility is accessible to geology faculty and students.

In addition to these facilities, each faculty member in the Geology Department has his/her own laboratory space for research and lab meetings.

FACULTY OF THE GRADUATE PROGRAM IN ENVIRONMENTAL AND EARTH SCIENCES

The members of the graduate faculty are listed below. Any of these individuals may serve as a research supervisor for students pursuing the M.S. degree with thesis, or the Ph.D. degree. Students interested in these degrees are strongly encouraged to familiarize themselves with the research interests of the faculty and contact a prospective research advisor at an early stage in their course of studies. Up-to-date information on faculty research interests and ongoing research projects can be found at the web sites of the departments, schools and colleges where these faculty members are appointed.

Department of Biology (College of Science)

*Paul T. Chippindale
Thomas H. Chrzanowski
Daniel R. Formanowicz
Laura Gough
James P. Grover
Robert F. McMahon
Laura Mydlarz
Sophia I. Passy
Jorge Rodrigues*

Department of Chemistry and Biochemistry (College of Science)

*Edward Bellion
Sandy Dasgupta
Krishnan Rajeshwar
Zoltan Schelly
Kevin Schug
Richard B. Timmons*

Department of City and Regional Planning (School of Urban and Public Affairs)

*James V. Cornehl
Joel B. Goldstein
Jeff Howard*

Department of Civil and Environmental Engineering (College of Engineering)

*Ernest C. Crosby
Andrew P. Kruzic
Syed R. Qasim
Melanie Sattler*

Department of Geology (College of Science)

*William L. Balsam
John M. Holbrook
Andrew Hunt
John Wickham*

Department of Psychology (College of Science)

Paul B. Paulus

SELECTED ALUMNI OF THE PROGRAM IN ENVIRONMENTAL AND EARTH SCIENCES

The list of Alumni below includes some of the recent graduates of the program and their professional positions after graduation.

Name	Degree	Degree Semester	Professional Position after Graduation
Robert Beleckis	Nonthesis M.S.	Fall 1996	Texas Natural Resources Conservation Commission
Randy Mitchell	Thesis M.S.	Spring 1997	Alcon Laboratories
Sanya Sirivithayapakorn	Thesis M.S.	Fall 1998	Earned the Ph.D. from the University of California at Santa Barbara, now at Kasetsart University, Thailand
Stephanie Nikirk	Nonthesis M.S.	Summer 2000	Employed by an engineering firm
Sharon Doyle	Nonthesis M.S.	Fall 2000	Trinity River Authority
Mick Cote	Nonthesis M.S.	Spring 2001	U.S. Public Health Service
Francisco S. Sanchez-Estrada	Ph.D.	Summer 2002	Universidad Autonoma de Estada de Mexico
Carrie Reese	Nonthesis M.S.	Spring 2003	North Central Texas Council of Governments
Robin Sargent	Nonthesis M.S.	Spring 2003	HBC/Terracon
Makenzie Vessely	Thesis M.S.	Fall 2004	Freese & Nichols
Brian Trotta	Nonthesis M.S.	Spring 2005	HBC/Terracon
Kenneth Tramm	Ph.D.	Spring 2005	Shaw Group
Shama Haque	Ph.D.	Spring 2007	University of Saskatchewan
Jennifer Adams	Nonthesis M.S.	Spring 2007	TXI Corp.
Tamara Hollowell	Nonthesis M.S., dual degree in CIRP	Spring 2007	North Central Texas Council of Governments
Shama Haque	Ph.D.	Spring 2007	University of Saskatchewan
Veena Ramakrishnan	Ph.D.	Spring 2007	National Center for Biological Sciences, India
Mark Dinubila	Thesis M.S.	Summer 2007	Tarrant County Public Health Dept.
Jason Baker	Ph.D.	Summer 2007	Natural Resource Conservation Service, US Department of Agriculture
Michael Perry	Nonthesis M.S.	Summer 2007	AT&T
Heeral Dave Champion	Thesis M.S.	Spring 2008	City of Dallas
Katy Gordon	Nonthesis M.S.	Summer 2008	KPA (consulting firm)

THE ARLINGTON AND DALLAS/FORT WORTH METROPLEX AREA

Housing:

The Arlington area has affordable housing for a metropolitan area. A number of apartments and small houses are within easy walking distance of the campus and many provide pools and/or security patrols. Typical rent for 1-2 bedroom apartments ranges from \$400-900 per month. UTA housing offers furnished and unfurnished one-bedroom apartments (there is sometimes a short waiting list) ranging from \$400-900 per month. Graduate students often share small two or three bedroom houses. If you are interested in sharing a house with a roommate, you may want to contact the graduate advisor, or students in the laboratory you plan to work in. Affordable to high-end housing can be found in suburban or country settings within a few miles of campus. A nice house with 3 bedrooms, 2 bathrooms, and a 2 car garage, on a good sized lot, currently runs from about \$100,000 to \$160,000, depending on square footage and custom features.

Shopping, Parks, Schools and Museums:

Major shopping centers, malls, cultural food markets, retail and wholesale outlets are all within a few miles of the campus. Arlington has a large selection of restaurants, offering a wide variety of ethnic cuisines, and the campus is surrounded by excellent lunch stops. Many childcare facilities are to be found within the city. Arlington has an excellent public school system as well as several private schools. The city has well-maintained and safe local parks, libraries and recreation centers, and Lake Arlington provides boating and fishing opportunities. The city of Arlington is also home to several major entertainment areas including Six Flags Amusement Park, Hurricane Harbor Water Park, and The Ballpark in Arlington, home of the Texas Rangers major league baseball team. A number of evening entertainment options are available in Arlington, and a short 30 minute drive, east to Dallas, or west to Fort Worth, allows access to a variety of urban cultural amenities, including major art museums, zoos, botanical gardens, opera, ballet, symphonies and theater. The metroplex is home for several additional professional sports teams including the Dallas Cowboys American football team (Texas Stadium is in Irving), Dallas Stars (hockey), Dallas Mavericks (basketball), Dallas Sidekicks (soccer) and the Fort Worth Fire (minor league hockey). Seasonal activities such as the Texas State Fair, the Cotton Bowl and Shakespeare in the Park, all in Dallas, and Riverfest and Shakespeare in the Park, in Fort Worth, provide opportunities for further cultural enrichment.

GRADUATE COURSE OFFERINGS

Graduate course offerings change frequently, so students should consult the Schedule of Classes, Graduate Catalog, EES Program Graduate Advisor, EES Program Director, and personnel from participating departments as needed to obtain current information. Only some of the core and supporting courses for the Environmental and Earth Sciences Program are directly administered by the program. These are listed with the EVSE prefix. Most of the supporting courses are administered by the participating departments. Inquiries about frequency of offering and scheduling should be directed to those departments. Some courses have prerequisites, and students should consult the graduate catalog and the individual instructors with questions about their level of preparation for particular courses. Seminar and special topics courses in EVSE and in participating departments are offered periodically. Up to 9 hours of 3000- and 4000-level undergraduate courses can also be applied towards formal coursework requirements in the Master's and Ph.D. degree programs, with approval of the student's supervising committee.

Environmental and Earth Sciences (EVSE)

5309. ENVIRONMENTAL SYSTEMS – BIOLOGICAL ASPECTS
5310. ENVIRONMENTAL SYSTEMS – CHEMICAL ASPECTS
5311. ENVIRONMENTAL SYSTEMS – GEOLOGICAL ASPECTS
5320. TOXICOLOGY
5321. ENVIRONMENTAL HEALTH
5322. ENVIRONMENTAL RISK ASSESSMENT

Biology (BIOL)

BIOL 3310. BIOLOGY OF TEXAS
BIOL 3341. ENTOMOLOGY
BIOL 3455. INVERTEBRATE ZOOLOGY
BIOL 3457. GENERAL ECOLOGY
BIOL 4444. VERTEBRATE NATURAL HISTORY
BIOL 5306. BIOENERGETICS
BIOL 5314. BIOMETRY
BIOL 5315. COMMUNITY ECOLOGY
BIOL 5320. BIOGEOGRAPHY
BIOL 5321. QUANTITATIVE ECOLOGICAL ANALYSIS
BIOL 5328. LANDSCAPE ECOLOGY
BIOL 5325. PLANT ECOLOGY
BIOL 5326. WETLANDS ECOLOGY
BIOL 5333. BIOLOGICAL MODELING
BIOL 5339. ENVIRONMENTAL PHYSIOLOGY
BIOL 5342. ICHTHYOLOGY
BIOL 5345. ORNITHOLOGY
BIOL 5348. ENVIRONMENTAL BIOLOGY
BIOL 5350. CONSERVATION BIOLOGY
BIOL 5351. ENVIRONMENTAL MICROBIOLOGY
BIOL 5354. LIMNOLOGY
BIOL 5355. AQUATIC BIOLOGY
BIOL 5361. ADVANCED BIOMETRY
BIOL 5362. EXPERIMENTAL DESIGN

Chemistry and Biochemistry (CHEM)

CHEM 5308. DETERMINATION OF MOLECULAR STRUCTURE BY PHYSICAL METHODS
CHEM 5319. GENERAL BIOCHEMISTRY I
CHEM 5461. ANALYTICAL INSTRUMENTATION
CHEM 6203. REGULATORY ASPECTS OF THE CHEMICAL INDUSTRY
CHEM 5309. ORGANIC CHEMISTRY I
CHEM 5310. ORGANIC CHEMISTRY II

CHEM 5311. ANALYTICAL CHEMISTRY
CHEM 5315. INORGANIC CHEMISTRY
CHEM 5320. GENERAL BIOCHEMISTRY II
CHEM 5321. METABOLISM AND REGULATION
CHEM 5325. ENZYMOLOGY
CHEM 5350. ADVANCED POLYMER CHEMISTRY
CHEM 6201. UNIT OPERATIONS
CHEM 6202. PRINCIPLES OF INDUSTRIAL CHEMISTRY

Civil and Environmental Engineering (CE)

CE 5318. PHYSICAL-CHEMICAL PROCESSES I
CE 5319. PHYSICAL-CHEMICAL PROCESSES II
CE 5320. SOLID WASTE MANAGEMENT
CE 5321 ENGINEERING FOR ENVIRONMENTAL SCIENTISTS
CE 5325. BIOLOGICAL PROCESSES
CE 5328 FUNDAMENTALS OF AIR POLLUTION
CE 5322 AIR POLLUTION METEOROLOGY AND CHEMISTRY
CE 5323 AIR POLLUTION DISPERSION MODELING
CE 5324 TRANSPORTATION AND AIR QUALITY
CE 5329. ENVIRONMENTAL RISK BASED CORRECTIVE ACTION
CE 6323. HAZARDOUS WASTE MANAGEMENT
CE 5347. SURFACE WATER HYDROLOGY
CE 5348. GROUND WATER HYDROLOGY
CE 6314. STORM WATER MODELING
CE 6324. DISPERSION MODELING
CE 6326. INDUSTRIAL AND HAZARDOUS WASTE
CE 6328. MODELING OF NATURAL WATER SYSTEMS
CE 6329. ADVANCED ENVIRONMENTAL ENGINEERING CONTROL PROCESSES

City and Regional Planning (CIRP)

CIRP 5304. PLAN IMPLEMENTATION (Zoning, Subdivision Ordinances, Capital Budgets)
CIRP 5340. SUITABILITY ANALYSIS
CIRP 5341. ENVIRONMENTAL REGULATIONS: LAWS AND PLANNING
CIRP 5342. URBAN ENVIRONMENTAL POLICY
CIRP 5350. ENVIRONMENTAL PLANNING
CIRP 5351. TECHNIQUES OF ENVIRONMENTAL ASSESSMENT
CIRP 5357. INTERMEDIATE GEOGRAPHIC INFORMATION SYSTEMS
CIRP 5305. LAND USE, MANAGEMENT AND DEVELOPMENT
CIRP 5311. ELEMENTS OF URBAN DESIGN
CIRP 5313. URBAN GROWTH POLICIES
CIRP 5356. GEOGRAPHIC INFORMATION SYSTEMS
CIRP 5353. ENVIRONMENTAL LAW

Geology (GEOL)

GEOL 5301. ENVIRONMENTAL GEOCHEMISTRY AND GEOLOGY
GEOL 5303. UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS (GIS)
GEOL 5306. ENVIRONMENTAL GEOLOGY
GEOL 5308. NATURAL ENVIRONMENTAL HAZARDS
GEOL 5325. PALEOCLIMATOLOGY AND PALEOOCEANOGRAPHY
GEOL 5348. MARINE GEOLOGY

Industrial and Manufacturing Systems Engineering (IE)

IE 5318 Advanced Statistics

Mathematics (MATH)

MATH 5305 Statistical Methods
MATH 5314 Experimental Design
MATH 5355 Applied Linear Models
MATH 5358 Regression Analysis
MATH 5359 Survival Analysis
MATH 5356 Applied Multivariate Statistical Analysis

Operations Management (OPMA)
OPMA 5364 Project Management
OPMA 5361 Operations Management

Psychology (PSYC)
PSYC 5347. ENVIRONMENTAL PSYCHOLOGY

Urban and Public Affairs (URPA)
URPA 5300. THE URBAN COMMUNITY
URPA 5301. FOUNDATIONS OF URBAN POLITICS AND ECONOMICS

APPENDICES

Student/Advisor Checklist - Master of Science Degree in Environmental and Earth Sciences

Within the first two semesters:

- 1. All students must form a committee consisting of at least three faculty members and submit a Tentative Degree Plan Worksheet to the Graduate Advisor. _____
- 2. Thesis students should also submit an Outline of Research Plans to thesis committee for approval. All committee members must sign the form and a copy must be filed with the Graduate Advisor. _____
- 3. All students must take and pass any assigned deficiency courses _____

In the final semester, to be met no later than the Graduate School deadline established for the semester, all students must:

- 1. enroll in at least one graduate course. _____
- 2. file the Final Degree Plan Worksheet with the Graduate Advisor _____
- 3. file the Application for Graduation and pay the diploma fee. _____
- 4. file the request for the Final Master's Examination with the Graduate School _____
- 5. complete the Final Master's examination, oral exam for non-thesis students, thesis defense for thesis students. _____

In the final semester, to be met no later than the Graduate School deadline established for the semester, thesis students must also:

- 1. enroll in the six hour thesis course. _____
- 2. file three signed, unbound copies of the final approved thesis with the Graduate School; _____
- 3. pay thesis processing fees; _____
- 4. complete the Thesis Data Sheet. _____

Student/Advisor Checklist - Doctor of Philosophy Degree in Environmental and Earth Sciences

Within the first two semesters:

- 1. A student must select a supervising professor and tentative supervising committee. _____
- 2. A student’s supervising committee should perform a Diagnostic Evaluation of the student and file a report with the Graduate Advisor and Graduate School. _____
- 3. A student must take and pass any assigned deficiency courses. _____

Within the first five semesters, a student must:

- 1. form the five member supervisory committee approved by the Graduate Advisor and Graduate Dean. _____
- 2. meet language requirement or equivalent determined by the supervisory committee. _____
- 3. complete and pass the oral Comprehensive Exam conducted by the supervisory committee. _____
- 4. successfully defend dissertation research proposal to the supervisory committee. Report filed by the committee with the Graduate Advisor. _____

In the final semester, to be met no later than the Graduate School deadline established for the semester, a students must:

- 1. enroll in the nine hour dissertation course. _____
- 2. file the Degree Plan Worksheet with the Graduate Advisor _____
- 3. file the Application for Graduation and pay the diploma fee. _____
- 4. file the request for the Dissertation Defense with the Graduate School _____
- 5. successfully defend the dissertation to the supervisory committee. Report filed by the committee with the Graduate Advisor. _____
- 6. file three signed unbound copies of the approved dissertation with the Graduate School, complete Microfilm Agreement, Copyright Authorization, and NRC Survey. _____
- 7. pay dissertation processing fees; _____
- 8. complete the Dissertation Data Sheet. _____