The University of Texas at Austin
Hildebrand Department of Petroleum and Geosystems Engineering
Cockrell School of Engineering

PhD Degree Requirements (updated 02/06/2025)

Students admitted to the university as a graduate student must complete additional requirements to become a PhD candidate. Students have two options for PhD.

(1) Master's Degree (in Engineering or a related field of study) **To PhD**
(2) Bachelor's Degree (in Engineering or a related field of study) **To Direct PhD**

With the first option, students must complete 24 semester hours of coursework plus at least 6 semester hours of the dissertation course, for a total of 30 semester hours. With the second option, Direct PhD pathway students must complete 36 semester hours of coursework and at least 6 credit hours of the dissertation course, for a total of 42 semester hours.

MASTER'S DEGREE TO PhD OPTION (24 approved credit hours beyond MS degree + 6 credit hours of dissertation)

- At least 15 of the semester credit hours must be PGE courses.
- Students who already have an MS degree in petroleum engineering from an accredited US or Canadian university need 18 hours of approved organized courses + 6 hours of approved individual instruction courses + 6 hours of dissertation courses = 30 hours. Students with a non-US bachelor's degree and non-US (or Canadian) master's degree need 24 hours of approved organized courses + 6 hours of dissertation = 30 hours. The majority of the courses must be taken within the PGE department.
- Remaining semester credit hours can be PGE graduate courses or approved Science or Engineering courses
- Non-technical courses are not approved.
- 3 of the 5 basic core courses for the MS degree can be taken as preparation for the written PhD qualifying examination.
- All courses must be taken for a letter grade and supervising committee (research advisor) may require additional courses

BACHELOR'S DEGREE TO DIRECT PhD OPTION (36 approved credit hours + 6 credit hours of dissertation)

- Courses are the same requirement as No Thesis No Report for Master's degree option
- Students will not receive an MS degree - Students will only receive a PhD degree at the completion of all the requirements

ADDITIONAL PhD REQUIREMENTS FOR BOTH PhD OPTIONS:

- Students are responsible for satisfying the background course requirements in the academic program they submit. Undergraduate courses taken in fulfillment of background courses will not count
- Toward the PhD degree. Graduate courses taken as background courses can count towards the PhD degree with approval from the Graduate Advisor.
- The academic program must be approved by the GSC, although the coursework does not have to be completed to apply to candidacy.
- A student must maintain a minimum 3.5 GPA for all courses taken at UT Austin while in the PhD program.

PhD TO DO LIST:

SELECT A DISSERTATION TOPIC

- One or more PGE faculty members will supervise the research.
- Select a supervising committee with GSC approval. A committee will have 5 members. At least 3 members are PGE faculty on the GSC (Graduate Studies Committee). 1 member must be from outside the GSC and can be outside UT. The 5th member can be a non-GSC PGE faculty or faculty from another UT department. However, 4 PGE faculty are preferred.

PASS 3 SELECTED QUALIFYING EXAM GRADUATE COURSES

- Students can choose from these six qualifying exam courses: (1) Advanced Petrophysics, (2) Transport Phenomena, (3) Advanced Engineering Mathematics (Engineering Analysis), (4) Subsurface Machine Learning, (5) Advanced Geomechanics, and (6) Advanced Thermodynamics.
- New PhD students (those with an MS degree from anywhere other than UT PGE Department) who are eligible must take the qualifying exam courses the first time they are offered after being in residence.
- Continuing PGE students (those obtaining an MS degree from UT Austin) must take the qualifying exam courses the first time they are offered after completion of the MS degree.
- Students must choose and pass 3 of the 6 specific qualifying exam courses in no more than two attempts to be considered for PhD candidacy.
- If a PhD aspirant fails to get a 3.3 GPA from the 3 selected qualifying exam courses of the PhD qualifying exams, one of the courses will need to be retaken to improve the GPA of the three classes to be 3.3 or above.

PASS AN ORAL PhD RESEARCH PROPOSAL EXAMINATION

- The exam is conducted by the student's PhD supervising committee.
- There will be an oral discussion of the proposed dissertation research to determine the student's grasp of the research problem and to assess future goals. It is not necessary to have made significant progress toward a solution of the research problem in order to present the research proposal.
- A PhD aspirant must complete this research proposal exam no later than 30 months from the date he/she entered the PhD PGE graduate program and after successful completion of the PhD written qualifying exams. Failure on the qualifying exam course(s) a second time will result in dismissal from the PGE graduate program.
- A PhD aspirant must prepare a written dissertation proposal (no more than 20 single-spaced pages including appendices). Submit copies to the committee members at least one week before the oral presentation is made. The student should consult with his/her supervising professor(s) about the detailed content of the proposal, but the proposal should not be significantly edited by the advisor. This is an exam.
- The presentation should be clear, concise, well thought-out and no longer than 30 minutes. Following the presentation, the committee will pose up to (but no more than) one hour of questions to the student.

- During the exam, committee members will suggest courses of action and make known their own expectations. A PhD aspirant must bring to the oral exam a completed departmental form (obtained from the Graduate Coordinator) that lists the coursework taken and grades achieved. After the exam, the signed original departmental form must be returned to the Graduate Office so that it can be kept on file. The committee decides if the student has passed the research proposal exam and makes recommendations to the student regarding additional coursework, if any, which should be taken. Options are pass, no pass, and fail. A no pass requires another oral exam. A PhD aspirant will be allowed two chances to pass the oral exam, but the exam must be retaken within three months.

PhD Qualifying Exam New Procedure Effective Fall 2021 and New PhD Proposal Information

The PhD Qualifying Exam is based on 6 signature graduate classes:

1) Advanced Petrophysics
2) Transport Phenomena
3) Advanced Engineering Mathematics
4) Subsurface Machine Learning
5) Advanced Geomechanics
6) Advanced Thermodynamics

PhD students will choose 3 out of the 6 classes listed above to be taken during the fall semester before the 12th class day. No changes can be made after the 12th class day.

Professors teaching the classes listed above can choose to implement either an individual-based final project or a final exam. Students should pass each of their selected 3 signature classes so that the combined 3-class GPA is 3.3 or higher (e.g. one A and two Bs).

Students who do not comply with the expected grades and GPA described above will not be allowed to take the PhD Proposal Exam and will have to wait until the same classes are taught the next year to retake those classes for which they did not achieve the expected grade and GPA.

PhD Proposal

The PhD Proposal Exam should be taken no later than 12 to 18 months after students pass the PhD Qualifying Exam. Regardless of timing, the PhD Proposal Exam should not be taken longer than 30 months after enrolling in the PhD program. It will be up to the student's supervising professor(s) to incentivize the student to take the PhD Proposal Exam as early as possible after having passed the PhD Qualifying Exam.

The PhD Proposal Exam should be written entirely by the student. The student's supervisor(s) can guide the student in the preparation of the proposal, but the final product should reflect the student's ability to formulate, investigate, and write a research proposal as stated by the GSC.

In addition to the 4 members of the PhD Proposal Exam committee, the GSC will designate a "referee" professor, who will attend the exam to oversee that all exam provisions are safeguarded and that the exam is performed according to expectations of fairness and equity. The "referee" professor may not want to serve on the eventual PhD Dissertation Committee after the student passes the PhD Proposal Exam; in that case, the PhD committee could be finalized with 5 members plus one (the "referee" professor).

The student should provide her/his PhD Proposal committee with the final written PhD proposal at least 30 days prior to the date of the PhD Proposal Exam. Committee members will have 30 days to provide comments, edits, and feedback to the student concerning the proposal and should approve the proposal prior to holding the exam. All members of the PhD Proposal Exam committee should have formally approved the student's PhD proposal prior to holding the Proposal Defense Exam.

All 4 members of the PhD Proposal Exam plus the "referee" professor should be present during the

entire duration of the exam. There should be no last-minute changes and no professor should request a private one-on-one examination with the student because of last-minute changes to her/his schedule.

During the exam, the student's supervising professor(s) will not be allowed to ask questions, answer questions, or make clarification remarks unless requested by the "referee" professor.

The duration of the exam should not exceed 2.0 hours total. The exam will begin with a 30-minute presentation by the student of her/his PhD Proposal. Only clarification questions can be asked by members of the student's committee during the student's presentation.

Questions during the PhD Proposal Exam should be approximately 50% about the physics/engineering/math background and 50% about the student's proposal. It is here emphasized that the oral questions concerning physics/engineering/math background are not intended to replicate questions already included in the student's 3 signature classes; they are intended to probe the student's understanding of the basic concepts underlying her/his PhD research proposal.

At the end of the exam, the student's supervising professor(s) will leave the room/call and discussions and deliberations will be conducted by the remaining members of the committee concerning the student's performance. A confidential vote will be conducted by the "referee" professor with two possible outcomes: (a) passing, or (b) not passing. Likewise, the remaining members of the committee will make suggestions for additional courses to be taken or sills to be improved by the student during the course of her/his PhD research. The committee will rank the student's performance in the areas of (a) academic background and knowledge, and (b) communication skills.

The student's supervising professor(s) can break a tie in the passing/not-passing vote by the remaining members of the PhD Exam Committee. This special situation will be overseen and conducted by the "referee" professor.

The final vote tally and suggestions by the PhD Exam Committee will be communicated to the supervising professor(s) and the GSC by the "referee" professor, aka Chairperson of the student's PhD Proposal Exam Committee. A majority of no passing votes will cause the student to be required to retake the PhD Proposal Exam within the ensuing 12 months. Not passing the exam during the second attempt will cause the student to be dismissed from the PhD program.

APPLY TO PhD CANDIDACY

- In order to be "advanced to candidacy", the PhD student must go online and submit their Application for Candidacy to the Graduate School. The student must present his/her course plan for the PhD degree to the Graduate Coordinator, including background course requirements. The student should see the Graduate Coordinator or Graduate Advisor, if assistance is needed.

AFTER APPROVAL OF PhD CANDIDACY, REGISTER FOR DISSERTATION COURSES

- A PhD student should register for dissertation courses ending in "W" (PGE 399W, PGE 699W, PGE 999W) every fall or spring semester until graduation. If the student graduates in the summer, enrollment in a dissertation course will be required in the summer session.

SCHEDULE FINAL ORAL EXAMINATION (DISSERTATION DEFENSE)

- Once a student's dissertation is nearing completion, it's time to schedule the defense – the final oral examination.
- A PhD student should do the following things: (1) Make arrangements for the defense at the beginning of the semester (especially during the summer) in order to accommodate the travel plans of the committee members (2) Choose a date and time that the committee members can attend (3) Contact PGE 2nd floor front desk staff in CPE 2.502 regarding available rooms for the selected final oral exam date or schedule a Zoom meeting (4) Schedule the final oral exam with the Graduate School at least two weeks prior to the exam date by completing the online "Request for Final Oral Examination form" found on the Graduate School's website (5) Email the final oral exam information (date, time, location, dissertation abstract) to the Graduate Coordinator within 2 days of completing the Graduate School's final oral exam form. The Graduate Coordinator will send an email invitation to PGE faculty and graduate students plus post flyers (during normal campus operations without pandemic operational changes) regarding the final oral exam.