The Doctor of Philosophy

As detailed below, the Doctor of Philosophy (Ph.D.) program requirements consist of:

1. Completion of at least 90 credits beyond the B.S. with a minimum of 1 year in residence.
2. Completion of at least 30 credits of graduate courses, not including seminar.
3. Registration for graduate seminar (ECH 6926) in each semester of residence.
4. Successful completion of a written and oral QUALIFYING EXAMINATION which includes a written program-of-study proposal.
5. Completion of a written DOCTORAL DISSERTATION and successful defense of the dissertation in a FINAL ORAL EXAMINATION.
6. Service as a Teaching Assistance for two semesters.
7. Present a research seminar to the department on the final results of the doctoral work.

The Ph.D. degree is for those who wish to attain mastery of a field of knowledge and demonstrate accomplishment in research. Study for the Ph.D. degree will be open only to those with demonstrated competence in the core areas of Chemical Engineering.

Course Requirements

Beyond the B.S. degree the Ph.D. degree requires successful completion of a minimum of 90 credits subject to restriction and classifications approved by the department. A minimum of 30 credits of courses acceptable for graduate credit and taken after the Bachelor's Degree are required. These 30 credits must include the three Basis courses that are offered in the Fall semester, a course in either reaction engineering, kinetics or biochemical engineering (or suitable equivalent), as well as at least two more courses in Chemical Engineering. Ph.D. students shall register for Chemical Engineering graduate seminar (ECH 6926) every semester of residence after the first semester; the credits earned cannot be counted toward the 30 required credits.

Transfer of MS Credits from other Institutions

Students with MS degrees in Chemical Engineering from other institutions may petition to transfer up to thirty credits toward their PhD requirements. Some of these transferred credits may be used to satisfy the Departmental requirements on core courses as well as the Engineering Science courses.

Campus Residency Requirements

Full-time student status requires at least 30 credit hours in each calendar year, or 36 hours within four semesters in two calendar years. After the first year, students must register for at least 9 credit hours in the Fall and Spring semesters, and at least 6 credit hours in the Summer.

Research

Students will be assigned a research advisor during the first semester of study. Before the end of the second semester, PhD students will nominate, with the advice and consent of the research adviser, the three or more other members of the Supervisory Committee, which include two other Graduate Faculty members from the Chemical Engineering Program, and one Graduate Faculty member from outside the Chemical Engineering Program. If a minor is pursued, it must be approved by the minor department and one member of the supervisory committee must be from the minor department. The research adviser is the Chairman or co-Chairman of the Supervisory Committee.
The Supervisory Committee is very important and should be chosen carefully; it assists in preparing and approves the program of study, approves the dissertation research, administers the candidacy examination, periodically reviews progress, and conducts the final oral examination. The Supervisory Committee is responsible for assuring that the completed dissertation is original research and is a contribution to the body of knowledge. The adviser and Supervisory Committee may assist the student in understanding all regulations governing the Ph.D. program, but the student has the ultimate responsibility for being aware of and meeting all requirements.

The Ph.D. candidate, upon completion of other degree requirements, will submit his/her dissertation to the Supervisory Committee and the Graduate School. The dissertation will be examined for at least two weeks by the committee, after which the research will be defended with at least four faculty members present with the candidate. The final oral examination shall be publicly announced and open to the public, although the dissertation committee may conduct a continuation of the examination in private with the candidate after the public presentation is completed. In any case, only the Supervisory Committee and other designated faculty sign the dissertation signature pages.

Qualifying Exam and Advancement to Candidacy

Final acceptance into the Ph.D. program requires successful completion of the QUALIFYING EXAM. The purpose of the exam (written and oral proposal) is to assess the student's potential to perform scholarly research at the PhD level. The student is to be evaluated for:

- Depth of knowledge in research area (i.e., review of relevant literature).
- Breadth of knowledge in fundamentals. These should include thermodynamics, transport phenomena, chemical engineering kinetics, and fundamentals related to research area (e.g., chemistry, biology, mathematics, materials, and surface chemistry).
- Ability to formulate a research plan.
- Critical thinking.

Eligibility

To be eligible to take the PhD the qualify exam, students must:

1. Maintain an average GPA of 3.0 in the three core Basis courses (Continuum Basis, Molecular Basis, and Mathematical Basis of Chemical Engineering) and remain in good academic standing (see the subsection I titled "coursework"). A student who gets less than a B in a Basis course must retake the course on the next available offering and obtain a B or better.
2. The students must also maintain a GPA of 3.5 or better for research in the semesters prior to the exam. This grade must be assigned by the research adviser, discussed with the student and placed on record in the students file prior to the examination.

Written Exam

The written exam is in the form of a research proposal due February 1st of the second year of the second year. This document must outline the area of research and its importance, problem statement, background to the research area, specific tasks that will be performed, preliminary results, and subsequent steps. A number of excellent manuals (consult, for example, references available via www.nsf.gov) are available on writing research proposals and may be used as guides in preparing the
proposal. A maximum of 25 single-spaced, typed (12-point font) pages, including figures and tables is recommended. It should include a title, a table of contents, and an abstract. The main body of the text would typically consist of the following:

1. **Introduction**: A concise overview of the research area and topic and their importance.
2. **Background**: Literature review and relevant background needed to place the proposed study in the larger context and to highlight the relevance and the novelty of the proposed work.
3. **Problem description**: A description of the specific problem and the objectives of the proposal and the novelty of the proposed work.
4. **Specific tasks**: A description of proposed theoretical and/or experimental work and a list of specific tasks (including feasibility probes) needed to accomplish the proposed objectives.
5. **Preliminary work**: Description of any preliminary work performed by the student and an analysis or discussion of such preliminary work.
6. **Future tasks**: Details of the subsequent steps planned to achieve the specific objectives of the research.
7. **Concluding remarks**: Closing remarks.
8. **References**: A list of references cited in the proposal.
9. **Tables & Figures**: Tables and figures used in the proposal should be integrated into the text.

**Oral Exam**

The student must take the oral exam within four months of the written exam submission or June 1st of their second year. The student will orally present the research proposal then answer questions about the research plan and general questions from the supervisory committee. The committee will evaluate the quality of the proposal and the response to questions about the proposal in order to assess the candidate's oral communication skills, depth of knowledge in research area, breadth of knowledge in chemical engineering fundamentals, ability to think critically, and ability to formulate and defend a research plan.

All members of the committee must be present during the examination. If a member is unable to attend, a suitable substitute approved by the Department must be appointed. The substitute member should be given sufficient time to read the report and prepare for the exam. A minimum of two weeks is recommended.

**Outcomes**

Students who successfully pass the oral and written exams have formally entered PhD candidacy. Students who fail the exam may be given the option (on the advice of the supervisory committee) of retaking the exam within 4 months or terminating with an MS degree (with or without thesis depending upon the advice given by the adviser), or an Engineer's degree should the student already have an MS degree.

**Important Dates to Remember**

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<th>Date</th>
<th>Event</th>
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<tr>
<td>February 1</td>
<td>Written proposal due (1 copy to Room 409 CHE-Shirley Kelly, and copies to the committee members)</td>
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<tr>
<td>Before June 1</td>
<td>Oral Examination for qualifying exam and advancement to candidacy</td>
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**Teaching-Assistantship Requirement**

To gain valuable teaching and communication experience consistent with the PhD degree, all PhD candidates are required to serve two semesters as a Teaching Assistant, as part of their graduate requirements. Exceptions will not, ordinarily, be permitted, and TA assignments will be made based on student course preferences in July of each year for the following academic year, students are ultimately
responsible for ensuring their TA requirement is met. Student who anticipate graduating within one year but have not yet fulfilled the two-semester TA requirement must notify the Graduate Coordinator.

**Research-Seminar Requirement**

Graduate students enrolled in the Ph.D. program are required to present a seminar to an audience comprised of all the graduate students and faculty. The seminar should be scheduled to take place during the last two semesters of the student's residence at UF and should cover selected results from the student's doctoral thesis. The students should provide the Seminar Coordinator with a title and a short abstract for the presentation in advance, and the seminar presentation should last no more than 30 minutes, including a 10-minute period for questions. The Ph.D. candidate is responsible for contacting the department Chairman or the department's Seminar Coordinator to schedule the time and date of the seminar. The doctoral degree will not be issued to candidates until the seminar requirement is satisfied.

**Other Remarks**

The minimum requirements for the Ph.D. program can be met in 3 years following the Bachelor's degree and all students are urged to complete their work as expeditiously as possible. If a longer period is required to complete the research project, students are encouraged to consider broadening their education by taking more than the minimum of courses.