

# Doctor of Philosophy in Engineering and Applied Science (Chemistry)

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A doctoral program in Engineering and Applied Science, administered through the College of Science and Engineering, is available to the students in the Department of Chemistry.

## Admission Requirements

In addition to the Graduate School Admission requirements, acceptance into Chemistry requires the following:

- A master's degree, completed prior to enrollment, in chemistry, biochemistry, applied science, or a related field aligned with the applicant's intended focus of study
- Endorsement of a major professor in Chemistry who has agreed to chair the applicant's dissertation committee

The candidate must submit:

1. All college/university transcripts;
2. Three letters of recommendation;
3. A one-page statement including research/career interests and goals and identifying their prospective major professor;
4. A resume or curriculum vitae

If not all requirements are met, the Chemistry Department may choose to admit the candidate to "Classified (with performance requirements)" status. Applicants admitted as "Classified (with performance requirements)" status will be required to rectify any deficiencies determined by the student's Program Director (or Coordinator) and the Chair of the Department.

## Course Requirements

The Ph.D. Advisory Committee will help the student design a doctoral Program of Study based on the student's background and research interests. The committee will consider the student's preparation for research and for the sub-disciplines needed to successfully complete Ph.D. coursework. In addition to the Graduate School requirements, the Department of Chemistry requires the following:

- A maximum of 30 prior M.S. credits may count towards the Ph.D. degree.
- The Ph.D. program must include at least 18 credits of coursework, out of which at least 9 credits must be at the 6000 level, and at least 6 of these must be in the emphasis area. All course credits must be approved by the Ph.D. advisory committee.
- The Ph.D. program must include between 1 credit and 4 credits of graduate chemistry seminar CHEM 6601.
- Dissertation credits must total between 32 to 35.
- A minimum of 84 credits are required for graduation.

## Guidelines for the Comprehensive-Qualifying Examination and the Ph.D. Advisory Committee (PAC) are as follows:

- The PAC has the responsibility for the student's progress until after the comprehensive qualifying examination has been satisfactorily completed and the student has been admitted to candidacy. Further, the committee members are responsible for preparation and grading of the comprehensive-qualifying examination which is to be at least eight hours long.

- Exam material can be at junior/senior levels with most of the material at the graduate level.
- The exam may be closed or open book. If closed book, data or any other relevant material may be supplied.
- In making the exam, the Committee should hold a meeting of its members to discuss the contents of the exam to make sure that the exam questions are within the scope and level of the student taking the exam. The Committee may also request other graduate faculty who are knowledgeable in the area of student's background to assist in the exam. Further, the Committee may decide to have some common questions in Mathematics appropriate for the program for all the students to ensure that the students have the basic competency expected of a Ph.D. student in Chemistry, Engineering (all programs), Geosciences, Mathematics, and Physics and also to ensure that there is some common basis for easy comparison of students.
- Each question should clearly specify the relative weight so that the student may properly allot time for each question.
- As the individual questions are sometimes made up and graded by different teachers, students are advised to start a new sheet for each question.
- To make sure the results of the exam are communicated by the end of the semester, the exam is normally held on the last Monday, Wednesday, and Friday in October for the fall semester, and March for the spring semester. The duration of the exam is 8 hours, normally held in three sessions of 2 hours and 40 minutes duration on three days. Each exam is weighted 33.33%.
- The Committee will conduct and grade the exam.
- The Committee should have a meeting of its members in which the grading and results are discussed and prepare a report to the Ph.D. Program Committee (PPC) or Dean of the College of Science and Engineering.
- The decision of the final result of the exam is to be made only after appropriate discussion by the PAC and all other faculty associated with the exam.
- The PAC as a whole can set any reasonable guidelines for the exam. As explained above, the exam will hold at least two meetings, the first one for making the exam and the second one for discussing grading, results, and preparing the report.

A minimum of 9 credits per semester is required in order for a student to qualify as a full-time graduate teaching/research assistant (GTA/GRA)

## Research Requirements

Substantial original research work is required to complete the doctoral studies. The dissertation must meet the following requirements:

- Contain results of relevant and original research approved by the student's Advisory Committee, and formatted according to the guidelines of the Graduate School
- Demonstrate student's mastery of the chosen research subject by designing and conducting research
- Demonstrate student's creativity, critical thinking, and problem-solving skills
- Demonstrate student's ability to investigate independently, and to discuss and articulate engineering and/or science problems to his/her peers
- Contribute to the engineering profession and/or scientific knowledge

### **Dissemination Requirement**

A seminar on the dissertation project must be presented prior to the dissertation defense. One of the following is required at the time of Dissertation defense

- At least one article accepted for publication (with DOI) in a peer-reviewed journal
- At least two articles submitted to peer-reviewed journals