CHEMISTRY (PH.D.)

https://ceps.unh.edu/chemistry/program/phd/chemistry-chemistry-education

Description

The Ph.D. program prepares students for careers in science as researchers and educators by expanding their knowledge of chemistry while developing their ability for critical analysis, creativity, and independent study. Graduates are well placed for careers as professional chemists in industry, academia, government, and related areas. All students take coursework, carry out original research with a faculty mentor, and submit a dissertation. The program has a focus on developing strong writing and oral communication skills. Financial support is typically available through a teaching assistantship.

Requirements

Ph.D. Degree Requirements

• Demonstration of a broad understanding of undergraduate chemistry by completing placement exams upon entry into the program. These are usually held during the Department Orientation Week.

• Coursework: To be determined with the consent of the research advisor beyond the 1st. semester, a minimum of 6 courses is required including a minimum of 3 at the 900 level.

• Professional development courses required - 4 courses.

• Attendance at Department Seminars.

• Attendance at Graduate Research Update sessions and presentation once annually from year two onward.

• Satisfactory presentation of a Research Progress Report in the second year of residence

• One oral presentation at a regional or technical conference, and one oral or poster presentation at the UNH Graduate Research Symposium.

• Preparation and oral defense of an original research prospectus in the third year of residence. Successful completion of the research proposal defense enables the student to advance to candidacy.

• Preparation, public presentation, and oral defense of a written dissertation.

• Required 3.0 GPA or above to graduate.

Faculty Research Advisor and Dissertation Committee

Students select a research advisor during the first semester in the program after interviewing at least three faculty members. During each semester thereafter, students conduct independent research under the supervision of the Faculty Research Advisor. In the second year of residence and before the Research Progress Report, a dissertation committee is selected. This committee evaluates the student’s Research Progress Report and the Research Proposal Defense. Once the Research Proposal Defense has been passed and the student advances to candidacy, a fifth committee member is selected and added to the Dissertation Committee to evaluate the Dissertation Defense.

Program Courses

CHEM 808 Spectroscopic Investigations of Organic Molecules 3
CHEM 840 Chemical Biology 3
CHEM 855 Advanced Organic Chemistry 3
CHEM 903 Advanced Inorganic Chemistry I 3
CHEM 902 Theoretical Organic Chemistry II 3
CHEM 904 Advanced Inorganic Chemistry II 3
CHEM 905 Advanced Physical Chemistry I 3
CHEM 911 Synthetic Organic Chemistry I 4
CHEM 917 Advanced Special Topics 2-4
CHEM 918 Advanced Special Topics 2-4
CHEM 925 Surface Chemistry 3
CHEM 926 Physical Chemistry of Condensed Phases 3
CHEM 927 Chemical Kinetics and Reaction Dynamics 3
CHEM 930 Advanced Optical Methods 3
CHEM 933 Chemical Separations 3
CHEM 934 Chemical Equilibria 3
CHEM 935 Advanced Analytical Chemistry 3
CHEM 995 Colloquium (Courses options: A) Inorganic Chemistry; B) Organic Chemistry; C) Theoretical Organic Chemistry; D) Physical Chemistry; E) Analytical Chemistry; F) Chemical Education) 1-4
MATH 835 Statistical Methods for Research 3
CHEM 999 Doctoral Research 0

Student Learning Outcomes

All graduates will be able to:

• Comprehend, plan and conduct advanced research under the guidance of a research advisor while developing their intellectual independence that demonstrates scholarship.

• Develop the ability to design and conduct experiments safely, as well as to analyze and interpret data.

• Develop and demonstrate oral and written communication skills to enable effective communication in all aspects of their professional career. This would include presentations, developing papers for published works and grant writing.

• Develop and apply theories, methodologies, and knowledge to address questions and resolve problems in the field of chemistry and in associated interdisciplinary projects.

• Develop the capacity of function and work effectively alone and in a team environment.

• Develop professional and ethic responsibility and follow this throughout their careers in the field or in academia.

• Conceive a research problem, plan and carry out the necessary experimental work, properly interpret the results, and advance their knowledge by independent study.

• Have a high degree of proficiency in a specialized field in addition to a wide breadth of knowledge of other fields.