Chemistry, PhD

Learning Outcomes

Students will:

- learn chemical principles and techniques beyond those typical of undergraduate academic training and apply them to chemistry research;
- identify original and worthwhile chemical problems stated as research questions and hypotheses;
- design and execute experiments as part of independent chemistry research investigations;
- critically evaluate their data, results, and conclusions and those of others in the chemistry community;
- identify potential problems in the responsible conduct of research and identify strategies for managing those problems;
- articulate standards for laboratory safety in chemical research, assess potential hazards they may encounter in novel chemistry research, and develop effective strategies to mitigate those risks; and
- communicate chemical knowledge, new models, and research results both orally and in writing for both technical and nontechnical audiences.

Requirements

The Doctor of Philosophy program in chemistry requires a minimum of 72 s.h. of graduate credit. Degree requirements include demonstrating proficiency in core areas of chemistry; completing a minimum of 11 s.h. of advanced coursework, a 1 s.h. ethics course, and a 1 s.h. chemistry proposal writing course; passing a comprehensive examination; successfully completing an original research proposal; giving two public seminars; and producing at least one published or accepted paper in a peer-reviewed journal based on a student's dissertation research.

Students who meet proficiency and advanced course requirements with a cumulative grade-point average of 3.00 or higher are admitted to the comprehensive examination. The examination is based on a research progress report and an oral examination with the student's graduate academic committee. Students must take the comprehensive examination no later than the end of their second year of enrollment.

Near the end of the PhD, candidates prepare the dissertation and present it to their graduate committee for review. The final examination consists of an oral defense of the dissertation, which may include the published or accepted paper(s) previously mentioned.

For more information and details, please visit the Graduate Program in Chemistry page on the Department of Chemistry website.

Combined Programs

PhD/MD

Students may work toward the Doctor of Medicine degree and a PhD in chemistry in a combined degree program offered by the Carver College of Medicine and the Graduate College. Applicants must be admitted to both programs before they may be admitted to the combined degree program. See the Medical Scientist Training Program (Carver College of Medicine) in the catalog.

Graduate Education

Graduate education prepares students with advanced knowledge and skills in specialized fields. At the University of Iowa, the Graduate College advocates for student-centered graduate education and supports equitable application of rules and policies across graduate programs.

Academics

University of Iowa graduate credentials are regulated by policies and requirements found in the Graduate College Manual of Rules and Regulations. This includes minimum grade-point average (GPA) requirements for academic standing and degree conferral. The Graduate College sets the minimum requirement. Individual graduate programs may establish higher GPA requirements.

Admissions

Graduate student applicants must meet admission requirements for both the Graduate College and the program to which they have applied. University of Iowa graduate admission requirements are published by the Graduate College and on the Graduate Admissions website.

Financial Support

Graduate students might be eligible for financial support. Several contingencies apply, including degree program and award type, satisfactory progress toward degree, satisfactory completion of all duties related to an appointment, and availability of funding. Graduate students should inquire directly with their program for more information about funding availability. The Graduate Student Employment Standards govern the employment relationship between the University of Iowa and all graduate teaching and research assistants in all matters except wages, which are covered by an existing collective bargaining agreement or the conditions of an applicable federal grant.

Admission

Applicants for graduate admission should have a bachelor's degree with a major in chemistry or a related field, preferably with a grade-point average of 3.00 or higher. Most admitted graduate students receive financial support. For application information, contact the Department of Chemistry or visit its website.

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website.

Career Advancement

Students with a chemistry degree can pursue careers in a wide range of fields. Learn more about career options for chemistry majors on the American Chemical Society website.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.

Academic Plans

Sample Plan of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

Chemistry, PhD

Course	Title	Hours
Academic Career		
Any Semester		
72 s.h. must be graduate level coursework; graduate transfer credit will be given consideration for a maximum of 6 s.h. of the 11 s.h. of required advanced coursework. More information is included in the General Catalog and on the department website. [a, b]		
Graduate College program GPA of at least 3.00 is required. [c]		
	Hours	**0**
First Year		
Any Semester		
Complete proficiency requirement [a]		
	Hours	**0**
Fall		
CHEM:5091	Graduate Chemistry Orientation	3
CHEM:5990	Chemistry Colloquium	0
CHEM:7999	Research in Chemistry	3
Divisional seminar		0
Proficiency course [d]		3
Proficiency course [d]		3
	Hours	**12**
Spring		
CHEM:5990	Chemistry Colloquium	0
CHEM:6990	Research Seminar [e]	1
CHEM:7999	Research in Chemistry	2
Advanced course [f]		3
Advanced course [f]		3
Divisional seminar		0
Proficiency course [d]		3
	Hours	**12**
Second Year		
Any Semester		
Exam: Doctoral Comprehensive Exam [g]		
	Hours	**0**
Fall		
CHEM:5990	Chemistry Colloquium	0
CHEM:6990	Research Seminar	1
CHEM:7999	Research in Chemistry	5
Advanced course [f]		3
Advanced course [f]		2
Divisional seminar [h, i]		1
	Hours	**12**
Spring		
CHEM:5990	Chemistry Colloquium	0
CHEM:6990	Research Seminar	1
CHEM:7270	Ethics in Chemical Sciences	1
CHEM:7999	Research in Chemistry	7
Advanced or elective course [f]		3
Divisional seminar		0
	Hours	**12**
Third Year		
Fall		
CHEM:5013	Science Writing in Chemistry [j]	1
CHEM:6990	Research Seminar	1
CHEM:7999	Research in Chemistry	6
	Hours	**8**
Spring		
CHEM:6990	Research Seminar	1
CHEM:7999	Research in Chemistry	7
	Hours	**8**
Fourth Year		
Fall		
CHEM:6990	Research Seminar	1
CHEM:7999	Research in Chemistry	1
	Hours	**2**
Spring		
CHEM:6990	Research Seminar	1
CHEM:7999	Research in Chemistry	1
	Hours	**2**
Fifth Year		
Fall		
CHEM:6990	Research Seminar	1
CHEM:7999	Research in Chemistry	1
	Hours	**2**
Spring		
CHEM:6990	Research Seminar	1
CHEM:7999	Research in Chemistry	1
Exam: Doctoral Final Exam [k]		
	Hours	**2**
	Total Hours	**72**

a Students must demonstrate basic proficiency in three chosen sub-disciplines of chemistry(analytical, biochemistry, inorganic, organic, physical). Proficiency is established in one of the following ways: 1) scoring at the 50th percentile level on the proficiency exam; 2) completing a one-semester review course with a grade of C or better; or 3) completing a one-semester graduate-level/advanced course in that sub-discipline of chemistry with a grade of B or better. The proficiency requirement must be fulfilled before the beginning of the student's third semester in the graduate program.

b Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.

c Graduate College program GPA is comprised of all courses that are approved degree requirements. If a student takes more than the minimum required number of semester hours to complete the degree, but all courses taken are eligible to count toward the degree, those courses will be included in the Graduate College program GPA.

d May take another course if proficiency requirement has been satisfied; work with faculty advisor to determine appropriate graduate coursework and sequence.

e Students should begin taking research seminar after joining a research group.
f Includes research; work with faculty advisor to determine appropriate graduate coursework and sequence.
g Students must complete the oral comprehensive examination not later than the end of their second year of enrollment.
h First required seminar.
i Students are expected to give a minimum of two acceptable seminars. One seminar must cover the student's research; the other may also deal with the student's research or can be an extensive literature report.
j Can be taken any fall semester after the Doctoral Comprehensive Exam.
k Dissertation defense at which time candidates present at least one published or accepted paper in a peer-reviewed journal based on the publishable portion of the thesis.