Chemistry
PhD

The Department of Chemistry offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy with majors in inorganic chemistry, organic chemistry, physical chemistry, and analytical chemistry.


The mission of the Department of Chemistry Ph.D. program is to provide quality-learning experiences, primarily, in hands-on laboratory research and also in classroom settings to post-baccalaureate students. These experiences will establish independent critical thinking and professional communication skills based on the theory, principles, and techniques of chemistry. Graduates will be prepared to work as independent professional researchers in chemistry capable of contributing to the original literature.

**Goal 1: Learning Chemistry:** Students will increase their knowledge of chemistry facts and relationships, both theoretical and practical, significantly develop their logical and critical thinking skills, including the design and interpretation of experiments.

**Goal 2: Communicating Chemistry:** Students will learn to communicate effectively in writing and in oral presentations on technical topics.

**Goal 3: Acting Professionally:** Students will learn the most appropriate way to get a job done by acting ethically, professionally, and becoming an independent scholar.

**Admission Requirements**
The applicant must meet the School of Graduate Studies’ current minimum general admission requirements as published in the graduate catalog.

1. A baccalaureate degree with a major in chemistry.
2. Undergraduate credit in mathematics through integral calculus.
3. One year of physics.
4. Graduate Record Examination General test for all students. (Chemistry subject test also required for all applicants without a baccalaureate degree in Chemistry).
5. Students with a bachelor’s degree may be directly admitted into the Ph.D. program.
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

**Degree Requirements**
Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Chemistry Department. The degree of Doctor of Philosophy with a major in chemistry is a research degree and is conferred only in recognition of high achievement in independent scientific research and scholarship.

A candidate for the Ph.D. degree with a major in chemistry must complete a research problem in one of the four fields of chemistry. The scope of the doctoral dissertation will be such as to require the equivalent of at least one full-time academic year of research. Some doctoral research will require a substantially longer time. This research is expected to make a significant contribution to the candidate’s chosen field of chemistry. When the major professor decides that the candidate has satisfactorily completed the research problem, the candidate, in accordance with the regulations of the University, is required to prepare a dissertation covering the research.

1. Completion of 90 semester credits beyond the baccalaureate degree
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.

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3. Required Courses:
   a) Two (2) credits of CHEM 509 Graduate Seminar
   b) Nine (9) credits of 500-level courses from major sequence
   c) Twelve (12) credits of elective courses (at least nine must be 500-level Chemistry courses; six of these nine must be taken in two divisions other than the major).
   d) CHEM 599 Research 55-57 credits
   e) CHEM 999 Dissertation 10-12 credits

Faculty and Areas of Expertise

- Harmon Abrahamson, Ph.D., Organometallic chemistry and photochemistry
- Julie Abrahamson, Ph.D., Chemical education
- R. Chu, Ph.D., Organic synthesis
- J. Delhommelle, Ph.D., Computational physical chemistry; molecular simulation of nonequilibrium processes
- Guodong Du, Ph.D., Inorganic and organometallic chemistry; catalysis and mechanism
- Sean Hightower, Ph.D., Materials Science
- Mark Hoffmann, Ph.D., Department Chair, Theoretical and computational physical chemistry
- Evguenii Kozliak, Ph.D., Physical biochemistry, biocatalysis in the gas phase, enzyme catalysis
- Alena Kubatova, Ph.D., Analytical separation methods applied to air pollution and climate change
- Alexei Novikov, Ph.D., Synthetic organic chemistry, total synthesis of natural products
- David Pierce, Ph.D., Electrochemical analysis and remediation, acoustic-wave sensor development
- Irina Smoliakova, Ph.D., Synthetic organic chemistry, stereochemistry, and carbohydrate chemistry
- Lothar Stahl, Ph.D., Main group and transition metal chemistry, materials, X-ray crystallography
- Kathryn Thomasson, Ph.D., Theoretical biophysical chemistry
- Julia Zhao, Ph.D., Design and chemical synthesis of nanoparticles, application of nanoparticles in bioanalysis

Contact Information
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