

Chemistry

Combined BS/MS

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 department offers a B.S./M.S. program (using the non-thesis M.S. option) for students who meet the admission criteria listed below.

Current areas of research specialization are synthetic and structural Organometallic Chemistry, Photochemistry, Theoretical Chemistry, Environmental Chemistry, Electroanalytical Chemistry, X-ray Crystallography, Synthetic Inorganic and Organic Chemistry, Optical Spectroscopy, Analytical Instrumentation, Inorganic Compounds for Materials Science, Carbohydrate Chemistry, Physical Biochemistry and Biocatalysis, Theoretical Biophysical Chemistry and Bionanotechnology.

Non-Thesis Option

Mission Statement and Program Goals

The mission of the Department of Chemistry combined B.S./M.S. program is to provide quality learning experiences in classroom and hands-on laboratory research and classroom settings to post-baccalaureate students. These experiences will establish critical thinking based on the theory, principles, and techniques of chemistry. Graduates will be prepared to become professional chemist in a variety of situations.

Goal 1: Learning Chemistry: Students will increase their knowledge of chemistry facts, relationships, and laboratory skills, improve their critical thinking skills, and learn to work as professional chemists.

Goal 2. Acting Professionally: Students will learn the most appropriate way to get a job done by acting ethically and professionally.

Admission Requirements

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

1. Completed the junior year (95 semester credits) in a Chemistry baccalaureate program with cumulative and chemistry GPAs of 3.0 or better in upper division courses in an American Chemical Society (ACS) certified program.+ International degrees will be evaluated for ACS certification equivalency.
2. One year general chemistry, one year organic chemistry, one semester analytical chemistry, and one semester physical chemistry.
3. International Students: A minimum TOEFL Score of 550 on the paper-based test or 213 on the computer-based test, or for the Internet-based TOEFL, a composite score of 79, with minimum scores of 21/30 (Speaking*); 19/30 (Listening); 19/30 (Reading); and 17/30 (Writing). Applicants may also meet language requirements by presenting IETLS scores of 6.5.
4. International applicants who have received their bachelor's or master's degree in the United States or English-speaking Canada are not required to submit the TOEFL or IELTS.
5. At least one letter of recommendation must be from a chemistry faculty member.
- 6.

+ Students will be admitted to School of Graduate Studies upon completion of 125 credits.

* Applicants being considered for Graduate Teaching Assistantships must achieve these minimum TOEFL scores, but have a minimum score of 26/30 on the Speaking subtest.

Degree Requirements

Students seeking the Bachelor of Science combined with the Master of Science (Non-Thesis Option) 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.

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Deadlines apply. See our website for more details.

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Email: questions@gradschool.und.edu

Non-Thesis Option (32 credits total):

1. Twelve (12) credits of graduate chemistry from area of specialization. May include one 400-level course – see the academic catalog for the list of these courses.*+
2. Nine (9) elective credits (may come from departments other than chemistry).+
3. One (1) credit of [CHEM 509](#) Graduate Seminar or [CHEM 488](#) Undergraduate Seminar (taken for graduate credit).
4. Eight (8) credits from either Co-op track or Research Track.
5. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institution.
6. Two (2) credits of [CHEM 997](#) Independent Study. Preparation of a written independent study and oral presentation of results to the advisor and interested faculty are required for successful completion of this course.
7. A written Comprehensive Examination in area of chemistry specialization will be taken while in residence. Students will be required to pass the nationally normalized ACS exam in their area of specialization at a proficient level.
8. Required Courses:
 - One (1) [CHEM 509](#) Graduate Seminar or [CHEM 488](#) Undergraduate Seminar (taken for graduate credit)
 - Two (2) credits of [CHEM 997](#) Independent Study. Preparation of a written independent study and oral presentation of results to advisor and interested faculty are required for successful completion of this course.
 - Eight (8) credit hours from either Co-op tract or Research Track – see academic catalog.
 - Twelve (12) credits of graduate chemistry from area of specialization. May include one 400-level course – see academic catalog.
 - Nine (9) elective credits (may come from departments other than chemistry).+

* The following undergraduate courses are eligible for inclusion on graduate programs of study as long as they are NOT required for the B.S. degree. Additional assignments and higher standards of accomplishment are required of students taking these courses for graduate credit: [CHEM 441](#) Instrumental Analysis I - Spectroscopy; [CHEM 442](#) Instrumental Analysis II - Electrochemistry; [CHEM 443](#) Instrumental Analysis III - Chromatography/Mass Spectrometry; [CHEM 454](#) Inorganic Chemistry II; [CHEM 455](#) Spectroscopy and Structure; [CHEM 463](#) Advanced Synthesis Laboratory; [CHEM 470](#) Thermodynamics & Kinetics; and [CHEM 471](#) Quantum Mechanics & Spectroscopy. See the Undergraduate catalog for course descriptions.

+ Requires prior approval of student's committee.

Faculty and Areas of Expertise

- **Harmon Abrahamson, Ph.D.**, Organometallic chemistry and photochemistry
- **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**
- **Mark Hoffmann, Ph.D.**, Department Chair, Theoretical and computational physical chemistry
- **Sean Hightower, Ph.D.**, Materials Science
- **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.**, (Graduate Program Director), Theoretical biophysical chemistry
- **Julia Zhao, Ph.D.**, Design and chemical synthesis of nanoparticles, application of nanoparticles in bioanalysis

Contact Information

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