Chemistry
Master of Science

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.


The mission of the Department of Chemistry graduate M.S. program is to provide quality-learning experiences in both hands-on laboratory research and classroom settings to post-baccalaureate students. These experiences will establish critical thinking and communication skills based on the theory, principles, and techniques of chemistry. Graduates will be prepared to become professional research chemists essential contributors technically competent to undertake any important task (under strategic guidance of a Ph.D. Chemist).

Goal 1: Learning Chemistry: Students will increase their knowledge of chemistry facts and relationships, both theoretical and practical, improve their logical and critical thinking skills, including the interpretation of experiments designed by Ph.D. chemists.

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 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. A baccalaureate degree with a major in chemistry.
2. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work or a GPA of at least 3.0 for the junior and senior years of undergrad work.
3. Undergraduate credit in mathematics through integral calculus.
4. One year of physics.
5. Graduate Record Examination General test for all students. (Chemistry subject test also required for all applicants without a baccalaureate degree in Chemistry.)
6. Satisfy the School of Graduate Studies’ English Language Proficiency requirements as published in the graduate catalog.

Degree Requirements
Students seeking the Master of Science (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.

Thesis Option (32 credits total):

1. A minimum of 32 semester credits in a major field, including the credits granted for the thesis and the research leading to the thesis.
2. At least one-half of the credits must be at or above the 500-level.
3. A maximum of one-fourth of the credit hours required for the degree may be transferred from another institute.
4. Required Courses:
   a) CHEM 509 Graduate Seminar – 1 credit

Apply online: http://graduateschool.und.edu
Deadlines apply. See our website for more details.
b) Six (6) credit hours from major sequence

c) Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>CHEM 541</td>
<td>Analytical Spectroscopy</td>
</tr>
<tr>
<td>CHEM 542</td>
<td>Electrochemical Methods</td>
</tr>
<tr>
<td>CHEM 543</td>
<td>Chromatography</td>
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Inorganic

Select one of the following:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>CHEM 510</td>
<td>Intermediate Inorganic Chemistry</td>
</tr>
<tr>
<td>CHEM 511</td>
<td>Advanced Inorganic Chemistry</td>
</tr>
<tr>
<td>CHEM 512</td>
<td>Organometallic Chemistry</td>
</tr>
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Organic

Select one of the following:

<table>
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<th>Title</th>
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<tbody>
<tr>
<td>CHEM 520</td>
<td>Advanced Organic Chemistry I</td>
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<tr>
<td>CHEM 521</td>
<td>Advanced Organic Chemistry II</td>
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<tr>
<td>CHEM 522</td>
<td>Advanced Organic Chemistry III</td>
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</tbody>
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Physical

Select two of the following:

<table>
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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>CHEM 530</td>
<td>Chemical Thermodynamics</td>
</tr>
<tr>
<td>CHEM 531</td>
<td>Chemical Dynamics</td>
</tr>
<tr>
<td>CHEM 532</td>
<td>Quantum Mechanics in Chemistry</td>
</tr>
</tbody>
</table>

d) Six (6) credit hours of 500-level chemistry courses from two divisions other than the major.
e) Three (3) credit hours of additional elective coursework
f) CHEM 599 Research 10-12 credits
g) CHEM 998 Thesis 4-6 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
- Evgueni 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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