Biochemistry

Department Information

- **Department Chair:**
  Gregory Cook, Ph.D.
- **Graduate Admissions Director:**
  Uwe Burghaus, Ph.D.
- **Department Location:**
  Ladd Hall
- **Department Phone:**
  (701) 231-8694
- **Department Web Site:**
  www.ndsu.edu/chemistry (http://www.ndsu.edu/chemistry/)

**Application Deadline:**
April 15 for fall, October 31 for spring. Spring admissions depend on the availability of fellowships and faculty interests. If there are no spring openings, spring applications are automatically considered for the subsequent fall semester.

**Credential Offered:**
Ph.D., M.S.

**Test Requirement:**
GRE required for applicants who have not earned a degree in the U.S. GRE (general and subject recommended for domestic applicants, but not required)

**English Proficiency Requirements:**
RA - TOEFL 71, IELTS 6, Duolingo 105; TA Grader - TOEFL 79, IELTS 6.5, Duolingo 110; TA Instructor - TOEFL 81, IELTS 7, Duolingo 115

Master of Science

The Master of Science program requires the completion of 30 graduate semester credits with an overall GPA of 3.0 or better. This total is comprised of both class work and research credit, but must include at least 16 semester credits of didactic course work (https://catalog.ndsu.edu/graduate/graduate-school-policies/).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 720</td>
<td>Introduction to Chemical Research</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 790</td>
<td>Graduate Seminar (second year seminar)</td>
<td>1</td>
</tr>
<tr>
<td>or BIOC 790</td>
<td>Graduate Seminar</td>
<td></td>
</tr>
<tr>
<td>UNIV 720</td>
<td>Scientific Integrity</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 790</td>
<td>Graduate Seminar (defense seminar)</td>
<td>1</td>
</tr>
<tr>
<td>or BIOC 790</td>
<td>Graduate Seminar</td>
<td></td>
</tr>
<tr>
<td>Didactic Credits (601-689, 691; 700-789, 791; 800-889 and 891)</td>
<td>16 *</td>
<td></td>
</tr>
<tr>
<td>CHEM 798</td>
<td>Master's Thesis</td>
<td>6-10</td>
</tr>
<tr>
<td>or BIOC 798</td>
<td>Master's Thesis</td>
<td></td>
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</tbody>
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**Total Credits Required**

30

As part of total semester credits, the following departmental courses are recommended for students based on discipline:

**Analytical**

- CHEM 632 | Analytical Chemistry II | 3 |
- CHEM 730 | Separations | 2 |
- CHEM 732 | Advanced Survey of Analytical Chemistry | 4 |
- CHEM 736 | Mass Spectrometry | 2 |

**Biochemistry and Molecular Biology**

- BIOC 673 | Methods of Biochemical Research | 3 |
- BIOC 674 | Methods of Recombinant DNA Technology | 3 |
- BIOC 701 | Comprehensive Biochemistry I | 4 |
- BIOC 702 | Comprehensive Biochemistry II | 4 |

**Inorganic**
A minimum of 10 must be from courses numbered 701-789; 791 or 800-889; 891

Each student chooses a thesis adviser within six months of beginning graduate school. As this is one of the most important decisions made in graduate school, students are strongly urged to visit multiple faculty members to discuss research opportunities. In addition, faculty seminars during the fall semester are designed to acquaint new students with the available research programs.

By the end of the first academic year, each student selects an advisory and examination committee, which consists of the thesis adviser, two other faculty members in the chemistry department, and one faculty member from a department outside the Department of Chemistry and Biochemistry.

### Doctor of Philosophy

The Ph.D. program requires the completion of 90 graduate semester credits, post-baccalaureate, with an overall GPA of 3.0 or better. This total is comprised of both class work and research credit, but must include of at least 27 semester credits of didactic course work (https://catalog.ndsu.edu/graduate/graduate-school-policies/).

Candidates for the PhD degree are required to earn at least 90 semester credits, which can include credits for seminar and research. No fewer than 27 of these 90 semester credits shall be earned in courses carrying graduate credit (courses numbered 601 to 789), and of these 27 credits, a minimum of 20 must be from courses numbered 701 to 789. Of these 20 credits, the requirement is 8 total credits in at least two fields of study other than the major area, selected from:

- Analytical Chemistry
- Biochemistry & Molecular Biology
- Coatings and Polymeric Materials
- Inorganic Chemistry
- Materials & Nanotechnology
- Microbiology
- Organic Chemistry
- Physical Chemistry
- Other related area (e.g., Physics, Math, Pharmacy, Engineering, Zoology)

A student matriculating with a Master's Degree, including one earned at an international institution, must earn not fewer than 60 graduate credits at NDSU. Of these credits, not fewer than 15 credits must be NDSU courses numbered from 701 to 789. Courses numbered 601-689 may be used for the Plan of Study as long as they have not been taken in an undergraduate or previous graduate program. Approved courses are Department of C&B 625, 626, 627, 628 and 630.

#### Code | Title | Credits
--- | --- | ---
CHEM 720 | Introduction to Chemical Research | Required Courses
BIOC 790 | Graduate Seminar (second year seminar) | or CHEM 790 | Graduate Seminar
BIOC 790 | Graduate Seminar (proposal seminar)
or CHEM 790  Graduate Seminar
BIOC 790  Graduate Seminar (public presentation)
BIOC 790  Graduate Seminar
or CHEM 790  Graduate Seminar
BIOC 790  Graduate Seminar (defense seminar)
UNIV 720  Scientific Integrity

As part of total semester credits, the following departmental courses are required for students based on program:

CHEM 725  Advanced Survey of Inorganic Chemistry
BIOC 673  Methods of Biochemical Research
BIOC 674  Methods of Recombinant DNA Technology
BIOC 701  Comprehensive Biochemistry I
BIOC 702  Comprehensive Biochemistry II
CHEM 732  Advanced Survey of Analytical Chemistry
CHEM 741  Physical Organic Chemistry I
CHEM 759  Advanced Survey of Physical Chemistry
BIOC 899  Doctoral Dissertation

Admission to candidacy for the Ph.D. degree is accomplished by satisfying three requirements: 1) satisfactory performance in course work with a minimum 3.0 grade-point average, 2) satisfactory performance on a written comprehensive examination, taken by the end of the fourth semester, and 3) satisfactory defense of an original research proposal on a topic approved by the student's supervisory committee. The defense of this proposal must occur at least eight months prior to the final oral examination.

Following completion of dissertation research, the candidate must complete a written dissertation and an oral presentation to the department and supervisory committee.