Biochemistry

Department Information

- **Department Chair:**
  Gregory Cook, Ph.D.
- **Graduate Admissions Director:**
  Sangita Sinha, 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 (general and subject recommended, but not required)
- **English Proficiency Requirements:**
  TOEFL ibT 81 (23 speak; 21 write) – TA, 71 – RA; IELTS 6.5 – TA; 6 – RA

Master of Science

The Master of Science program requires the completion of a total 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 consist of at least 16 semester credits from letter-graded course work. The Ph.D. program requires the completion of a total of 90 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 consist of at least 27 semester credits from letter-graded course work.

<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>
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</tbody>
</table>

**Total Credits Required**

The Master of Science program requires a total of 30 credits.

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

**Analytical**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>CHEM 632</td>
<td>Analytical Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 730</td>
<td>Separations</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 732</td>
<td>Advanced Survey of Analytical Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 736</td>
<td>Mass Spectrometry</td>
<td>2</td>
</tr>
</tbody>
</table>

**Biochemistry and Molecular Biology**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC 673</td>
<td>Methods of Biochemical Research</td>
<td>3</td>
</tr>
<tr>
<td>BIOC 674</td>
<td>Methods of Recombinant DNA Technology</td>
<td>3</td>
</tr>
<tr>
<td>BIOC 701</td>
<td>Comprehensive Biochemistry I</td>
<td>4</td>
</tr>
<tr>
<td>BIOC 702</td>
<td>Comprehensive Biochemistry II</td>
<td>4</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIV 720</td>
<td>Scientific Integrity</td>
</tr>
<tr>
<td>CHEM 725</td>
<td>Advanced Survey of Inorganic Chemistry</td>
</tr>
<tr>
<td>BIOC 673</td>
<td>Methods of Biochemical Research</td>
</tr>
<tr>
<td>BIOC 674</td>
<td>Methods of Recombinant DNA Technology</td>
</tr>
<tr>
<td>BIOC 701</td>
<td>Comprehensive Biochemistry I</td>
</tr>
<tr>
<td>BIOC 702</td>
<td>Comprehensive Biochemistry II</td>
</tr>
<tr>
<td>CHEM 732</td>
<td>Advanced Survey of Analytical Chemistry</td>
</tr>
<tr>
<td>CHEM 741</td>
<td>Physical Organic Chemistry I</td>
</tr>
<tr>
<td>CHEM 759</td>
<td>Advanced Survey of Physical Chemistry</td>
</tr>
<tr>
<td>BIOC 899</td>
<td>Doctoral Dissertation</td>
</tr>
</tbody>
</table>

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 advisory 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 advisory committee.