Biochemistry, B.A.

The Department of Biochemistry offers two bachelor's degrees—a B.A. and a B.S. To maximize student flexibility, the curriculum in the first two years of study is identical for both degrees.

Requirements

The Bachelor of Arts with a major in biochemistry requires a minimum of 120 s.h., including 58 s.h. of work for the major. Students must maintain a g.p.a. of at least 2.00 in all courses for the major and in all UI courses for the major. They also must complete the College of Liberal Arts and Sciences General Education Program.

The biochemistry major for the Bachelor of Arts degree provides a rigorous education in biochemical concepts and practice in the laboratory while giving students flexibility to specialize in additional disciplines or to obtain clinical volunteer experience. The B.A. program is intended for most students majoring in biochemistry, including those with pre-medicine, pre-pharmacy, pre-dental, and other pre-health professions interests. It also is appropriate for students earning more than one major.

Qualified students in the Bachelor of Arts degree program may graduate with honors in the biochemistry major; see Honors in the Major [p. 1] in this section of the Catalog.

The B.A. with a major in biochemistry requires the following course work.

| Common Requirements | 49 |
| Additional Requirements | 9 |
| **Total Hours** | 58 |

Common Requirements

Students complete the following during their first two years.

| BIOC:3120 & BIOC:3130 | Biochemistry and Molecular Biology I-II | 6 |
| BIOC:3140 | Experimental Biochemistry | 2 |
| BIOL:1411-1412 | Foundations of Biology | 8 |
| CHEM:1110 & CHEM:1120 | Principles of Chemistry I-II | 8 |
| CHEM:2210 | Organic Chemistry I | 3 |
| or CHEM:2230 | Organic Chemistry I for Majors | |
| CHEM:2220 | Organic Chemistry II | 3 |
| or CHEM:2240 | Organic Chemistry II for Majors | |
| CHEM:2410 | Organic Chemistry Laboratory | 3 |
| or CHEM:2420 | Organic Chemistry Laboratory for Majors | |
| MATH:1850 & MATH:1860 | Calculus I-II | 8 |
| PHYS:1511 | College Physics I | 4 |
| or PHYS:1611 | Introductory Physics I | |
| PHYS:1512 | College Physics II | 4 |
| or PHYS:1612 | Introductory Physics II | |

If students take PHYS:1612 Introductory Physics II, they must take the course with the lab component.

Additional Requirements

In addition to the common requirements listed above, students must complete the following.

One of these:

| BIOC:4241 | Biophysical Chemistry I | 3 |
| BIOC:4242 | Biophysical Chemistry II | 3 |
| CHEM:4430 | Principles of Physical Chemistry | 3 |
| CHEM:4431 | Physical Chemistry I | 3 |
| CHEM:4432 | Physical Chemistry II | 3 |

And:

Advanced science electives approved by biochemistry advisor | 6 |

Students intending to earn advanced degrees in the biological or health sciences are advised to earn at least 4 s.h. in BIOC:3993 Undergraduate Independent Study or BIOC:4999 Research, Independent Study. There are no prerequisites for BIOC:3993. The course involves experience in an active biochemistry research lab, which must be arranged ahead of time with a supervising faculty member. Students may make arrangements directly with the faculty member, or they may request assistance from an undergraduate advisor. Credit earned in BIOC:3993 does not count toward the major, but it does count toward the minimum of 120 s.h. required to graduate.

In order to register for BIOC:4999, students must have completed BIOC:3120 Biochemistry and Molecular Biology I, BIOC:3130 Biochemistry and Molecular Biology II, and BIOC:3140 Experimental Biochemistry. They must have a grade average of B or higher in the three courses and a grade of B-minus or higher in each course. They also must have completed BIOC:3150 Development of Senior Research Project and should have prior research experience (e.g., BIOC:3993 or HONR:3994 Honors Research Practicum) or URES:3993 Undergraduate Research and Creative Projects or consent of the instructor.

B.A. with Teacher Licensure

Students interested in earning licensure to teach in elementary and/or secondary schools must complete the College of Education's Teacher Education Program (TEP) in addition to the requirements for the major and all requirements for graduation. The TEP requires several College of Education courses and student teaching. Contact the Office of Student Services for details.

Students must satisfy all degree requirements and complete Teacher Education Program licensure before degree conferral.

Honors

Honors in the Major

Students have the opportunity to graduate with honors in the major. Departmental honors students must maintain a cumulative University of Iowa g.p.a. of at least 3.33. To graduate with honors in the biochemistry major, students must earn 6 s.h. in BIOC:4999 Research, Independent Study. They must present their research results in a report written in the form of a journal article and in an oral report given at a special open departmental seminar.
University of Iowa Honors Program

In addition to honors in the major, students have opportunities for honors study and activities through membership in the University of Iowa Honors Program. Visit Honors at Iowa to learn about the University’s honors program.

Membership in the UI Honors Program is not required to earn honors in the biochemistry major.

Academic Plans

Four-Year Graduation Plan

The following checkpoints list the minimum requirements students must complete by certain semesters in order to stay on the University’s Four-Year Graduation Plan. Courses in the major are those required to complete the major; they may be offered by departments other than the major department.


Before the seventh semester begins: PHYS:1611 Introductory Physics I or PHYS:1511 College Physics I, PHYS:1612 Introductory Physics II or PHYS:1512 College Physics II, BIOC:3120 Biochemistry and Molecular Biology I, BIOC:3130 Biochemistry and Molecular Biology II, BIOC:3140 Experimental Biochemistry, a science elective, and at least 90 s.h. earned toward the degree

Before the eighth semester begins: CHEM:4430 Principles of Physical Chemistry or CHEM:4431 Physical Chemistry I or CHEM:4432 Physical Chemistry II or BIOC:4241 Biophysical Chemistry I or BIOC:4242 Biophysical Chemistry II, and a science elective

During the eighth semester: enrollment in all remaining course work in the major, all remaining General Education courses, and a sufficient number of semester hours to graduate

Sample Plan of Study

Biochemistry (B.A.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM:1110</td>
<td>Principles of Chemistry I (also GE: Natural Sciences with a lab)</td>
<td>4</td>
</tr>
<tr>
<td>MATH:1850</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>RHET:1030</td>
<td>Rhetoric (GE: Rhetoric or other General Education course)</td>
<td>4</td>
</tr>
<tr>
<td>Elective course</td>
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<td>1</td>
</tr>
<tr>
<td>CSI:1600</td>
<td>Success at Iowa</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>15</td>
</tr>
</tbody>
</table>

Spring

CHEM:1120 Principles of Chemistry II (major, also GE: Natural Sciences) | 4 |
ENGL:1200 The Interpretation of Literature (GE: Interpretation of Literature) | 3 |
MATH:1860 Calculus II | 4 |
GE: Diversity and Inclusion | 3 |
Elective course | 1 |
| Hours | 15 |

Second Year

Fall

BIOL:1411 Foundations of Biology | 4 |
CHEM:2230 Organic Chemistry I for Majors | 3 |
GE: Historical Perspectives | 3 |
GE: World Languages or elective course | 3-5 |
Elective course | 2 |
| Hours | 15-17 |

Spring

BIOL:1412 Diversity of Form and Function | 4 |
CHEM:2240 Organic Chemistry II for Majors | 3 |
CHEM:2420 Organic Chemistry Laboratory for Majors | 3 |
GE: World Languages or elective course | 3-5 |
Elective course | 2 |
| Hours | 15-17 |

Third Year

Fall

BIOC:3120 Biochemistry and Molecular Biology I | 3 |
PHYS:1511 College Physics I | 4 |
Major: research or science elective (consult with advisor) | 3 |
GE: Values and Culture | 3 |
GE: World Languages or elective course | 3-5 |
| Hours | 16-18 |

Spring

BIOC:3130 Biochemistry and Molecular Biology II | 3 |
BIOC:3140 Experimental Biochemistry | 2 |
PHYS:1512 College Physics II | 4 |
GE: Literary, Visual, and Performing Arts | 3 |
GE: World Languages or elective course | 3-5 |
| Hours | 15-17 |

Fourth Year

Fall

CHEM:4431 Physical Chemistry I | 3 |
Major: research, independent study, or elective (consult with advisor) | 3 |
Major: science elective (consult with advisor) | 3 |
GE: International and Global Issues | 3 |
Elective course | 3 |
| Hours | 15 |

Spring

Major: research, independent study or elective (consult with advisor) | 3 |
Major: science elective (consult with advisor) | 3 |
GE: Social Sciences | 3 |
Elective course | 3 |
Enrollment in chemistry and math courses require completion of placement exams.

2. General Education (GE) courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses. For more information, view the General Education Program.

3. Students may use their elective courses to complete a double major, minors, or certificates.

4. Students who have completed four years of a single language in high school have satisfied the College of Liberal Arts and Sciences GE: World Languages requirement. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course.

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**Career Advancement**

Biochemistry graduates with bachelor’s degrees often work as research assistants in industry, government, education, or health services; teach in secondary schools; or go on to advanced study in medicine, dentistry, or other areas. The program offers solid preparation for careers in medicine, biology, chemistry, dentistry, research, or related sciences. About one-third of biochemistry majors go on to study medicine; others enter graduate programs or professional degree programs.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.