Chemistry, B.A.

Requirements

The Bachelor of Arts with a major in chemistry requires a minimum of 120 s.h., including 53-54 s.h. of work for the major (20 s.h. in foundation chemistry courses, 12 s.h. in advanced chemistry, and 21-22 s.h. in supporting course work). B.A. students must earn at least 11 s.h. in advanced chemistry courses at the University of Iowa. 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 B.A. degree is a good choice for students interested in medical or other professional schools, or those interested in a teaching career (see “B.A. with Teacher Licensure” below). The program provides students with the flexibility to earn a degree in chemistry while they also complete related courses required for medical school, such as biology and biochemistry. Compared to the B.S. degree, the B.A. has modified mathematics requirements that include a one-semester physical chemistry course, an analytical chemistry course, and a single, integrated capstone laboratory that incorporates analytical, inorganic, and physical chemistry experiments.

Courses in the chemistry major have prerequisites, so they must be taken in the correct order. Advanced chemistry courses are built on the chemistry foundation courses. Most advanced courses are taught only once a year. Students should consult their academic advisors and plan their course schedules carefully. They should take CHEM:2021 Fundamentals of Chemical Measurements during the first semester of the second year.

Students may not use a course to fulfill more than one requirement.

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

<table>
<thead>
<tr>
<th>Course Category</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Foundation Courses</td>
<td>20</td>
</tr>
<tr>
<td>Advanced Chemistry Courses</td>
<td>12</td>
</tr>
<tr>
<td>Mathematics Courses</td>
<td>7-8</td>
</tr>
<tr>
<td>Introductory Physics Courses</td>
<td>8</td>
</tr>
<tr>
<td>Science Electives</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td>53-54</td>
</tr>
</tbody>
</table>

Chemistry Foundation Courses

Students complete the following foundation courses.

All of these:

- CHEM:1110 & CHEM:1120 Principles of Chemistry I-II 8
- CHEM:2021 Fundamentals of Chemical Measurements 3

One of these sequences:

- CHEM:2210 & CHEM:2220 Organic Chemistry I-II 6
- CHEM:2230 & CHEM:2240 Organic Chemistry I for Majors - Organic Chemistry II for Majors (preferred) 6

Advanced Chemistry

One of these:

- CHEM:3110 Analytical Chemistry I 3
- CHEM:3120 Analytical Chemistry II (preferred) 3

All of these:

- CHEM:3250 Inorganic Chemistry 3
- CHEM:4430 Principles of Physical Chemistry 3
- CHEM:4450 Synthesis and Measurement 3

Mathematics

One of these:

- MATH:1460 Calculus for the Biological Sciences (preferred) 4
- MATH:1550 Engineering Mathematics I: Single Variable Calculus 4
- MATH:1850 Calculus I 4

One of these:

- MATH:1560 Engineering Mathematics II: Multivariable Calculus 4
- MATH:1860 Calculus II 4
- STAT:2010 Statistical Methods and Computing 3
- STAT:3510 Biostatistics (preferred) 3

Introductory Physics

All students complete one of these sequences.

- PHYS:1511-PHYS:1512 College Physics I-II (preferred) 8
- PHYS:1611-PHYS:1612 Introductory Physics I-II 8

Science Electives

Some of these courses may be used to fulfill other requirements for the major, as listed above; students who have used a course from this list to fulfill another requirement for the major may not use that course as an elective. Students should consult their advisor to gain approval for a course that is not on the list. Undergraduate Research (CHEM:3994) may not be used to satisfy the science electives requirement.

A total of 6 s.h. from these:

- CHEM:3110 Analytical Chemistry I 3
- CHEM:3120 Analytical Chemistry II 3
- CHEM:3430 Analytical Measurements 3
- CHEM:3440 Physical Measurements 3
- CHEM:3530 Inorganic Chemistry Laboratory 3
- CHEM:4171 Advanced Analytical Chemistry 3
- CHEM:4270 Advanced Inorganic Chemistry 3
Undergraduate Research or HONR:3994 Honors Research Practicum to earn credit for their research. They are encouraged but not required to present their research at local and regional meetings and to publish their results in professional journals.

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 chemistry 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.

Courses in the chemistry major have prerequisites, so they must be taken in the correct order. Most advanced courses are taught only once a year. Students should consult their academic advisors and plan their course schedules carefully. They should take CHEM:2021 Fundamentals of Chemical Measurements during the first semester of the second year. Typical chemistry course schedules and a regression list are available at Undergraduate Program in Chemistry on the Department of Chemistry website.

Before the third semester begins: math through MATH:1440 Calculus for the Biological Sciences or calculus I; CHEM:1110 Principles of Chemistry I and CHEM:1120 Principles of Chemistry II, or equivalent coursework.

Before the fifth semester begins: basic measurements; organic chemistry I, II, and lab; and biostatistics or calculus II.

Before the seventh semester begins: two more courses in the major; physics I and II; and at least 90 s.h. earned toward the degree.

Before the eighth semester begins: principles of physical chemistry and one more course in the major.

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

Chemistry (B.A.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</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:1440</td>
<td>Mathematics for the Biological Sciences (also GE: Quantitative or Formal Reasoning)</td>
<td>4</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Hours</td>
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<tr>
<td>RHET:1030</td>
<td>Rhetoric (GE: Rhetoric or other General Education course)</td>
<td>4</td>
</tr>
<tr>
<td>GE: World Languages or elective course</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>CSI:1600</td>
<td>Success at Iowa</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>17-19</td>
</tr>
</tbody>
</table>

### Spring

**CHEM:1120** Principles of Chemistry II (also GE: Natural Sciences with a lab) | 4 |
**MATH:1460** Calculus for the Biological Sciences | 4 |
**GE: Diversity and Inclusion** | 3 |
**GE: World Languages or elective course** | 3-5 |

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<td><strong>Total Hours</strong></td>
<td>15-17</td>
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### Second Year

#### Fall

**CHEM:2021** Fundamentals of Chemical Measurements | 3 |
**CHEM:2230** Organic Chemistry I for Majors | 3 |
**ENGL:1200** The Interpretation of Literature (GE: Interpretation of Literature) | 3 |
**GE: World Languages or elective course** | 3-5 |

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<td><strong>Total Hours</strong></td>
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#### Spring

**CHEM:2240** Organic Chemistry II for Majors | 3 |
**CHEM:2420** Organic Chemistry Laboratory for Majors | 3 |
**STAT:3510** Biostatistics | 3 |
**GE: Historical Perspectives** | 3 |
**GE: World Languages or elective course** | 3-5 |

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<td>15-17</td>
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</table>

### Third Year

#### Fall

**CHEM:3110** Analytical Chemistry I | 3 |
**PHYS:1511** College Physics I | 4 |
**GE: Social Sciences** | 3 |
**GE: Values and Culture** | 3 |

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<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>15-16</td>
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#### Spring

**CHEM:3250** Inorganic Chemistry | 3 |
**PHYS:1512** College Physics II | 4 |
**GE: Literary, Visual, and Performing Arts** | 3 |

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<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>15-16</td>
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### Fourth Year

#### Fall

**CHEM:4430** Principles of Physical Chemistry | 3 |
**Major: advanced chemistry elective course** | 3 |

<table>
<thead>
<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td>15</td>
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</table>

#### Spring

**CHEM:4450** Synthesis and Measurement | 3 |
**Major: advanced chemistry elective course** | 3 |

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1. 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.
2. 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.
3. Students may use their elective courses to complete a double major, minors, or certificates.

### Financial Support

**Scholarships and Awards**

A number of awards and scholarships are available to chemistry majors, including the American Institute of Chemists Award, the Undergraduate Award in Analytical Chemistry, the Chemistry Alumni Awards (one each for a sophomore, a junior, and a senior), the Merck Index Award, and the Viksnins, Harris & Padyx PLLP Award.

Chemistry majors also may apply for the Donald J. and Margaret Burton Scholarship, Ken Sando Scholarship, Shoemaker-Strickler Scholarship, E. David Cater Scholarship, and Russell K. Simms Scholarship.

Visit Undergraduate Scholarships & Awards on the Department of Chemistry website.

### Career Advancement

The undergraduate major in chemistry provides a strong foundation for success in graduate and professional study and for positions in academic or industrial chemistry.

Students with a chemistry degree can pursue careers or graduate study in a wide range of fields. Learn more about career options for chemistry majors on the American Chemical Society website.

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