## University Core and Graduation Requirements

### University Core Requirements:

**Requirements**

<table>
<thead>
<tr>
<th>Classes</th>
<th>Hours</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### Religion Cornerstones

- Teachings and Doctrine of The Book of Mormon
- Jesus Christ and the Everlasting Gospel
- Foundations of the Restoration
- The Eternal Family
- The Individual and Society

- American Heritage
- Global and Cultural Awareness

- First Year Writing
- Advanced Written and Oral Communications
- Quantitative Reasoning
- Languages of Learning (Math or Language)

#### Arts, Letters, and Sciences

- Civilization 1
- Civilization 2
- Arts
- Letters
- Biological Science
- Physical Science
- Social Science

#### Core Enrichment: Electives

- Religion Electives
- Open Electives

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### Graduation Requirements:

- Minimum residence hours required: 30.0
- Minimum hours needed to graduate: 120.0

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## Suggested Sequence of Courses

### Freshman Year

**1st Semester**

- First-Year Writing or A HTG 100: 3.0
- Biological Science*: 3.4
- MATH 112 (FWSpSu): 4.0
- Religion Cornerstone course: 2.0

**Total Hours:** 16-17.0

*With department approval, CHEM 105 may be substituted for CHEM 111.

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### Sophomore Year

**3rd Semester**

- CHEM 227 (FSp): 4.0
- CHEM 301*: 3.0
- STAT 201 (FW): 3.0
- PHSCS 121 (FWSp): 3.0
- Religion Cornerstone course: 2.0

**Total Hours:** 15.0

*CHEM 351 may substitute for CHEM 351.

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### Junior Year

**5th Semester**

- CHEM 462 (F) or CHEM 481M*: 3.0
- CHEM 460: 3.0
- CHEM 464 & 465 (W) or CHEM 482 (W) or other Requirement 4: 2.3.0
- Arts: 3.0
- Civilization 2: 3.0
- Religion Elective: 2.0

**Total Hours:** 16-17.0

*CHEM 481 can be substituted for 481M.

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### Senior Year

**6th Semester**

- CHEM 391 (FW): 3.0
- CHEM 463 (W) or CHEM 468 (W): 3.0
- CHEM 464 & 465 (W) or CHEM 482 (W) or other Requirement 4: 2.3.0
- Letters: 2.0
- Religion Elective: 2.0
- Open electives: 6.0

**Total Hours:** 14.0

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### Note:

Chem 499R is a research capstone class. Typically, enrollment in CHEM 498 follows enrollment in CHEM 497R. Both courses give students an opportunity to be mentored in a faculty’s research lab and receive class credit. Permission from faculty to enroll in either course is required. Contact department office for specific details.
### BA in Chemistry (692827)
#### 2020-2021 Program Requirements (57.5 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REQUIREMENT 1 Complete 10 courses</strong></td>
<td></td>
</tr>
<tr>
<td>CHEM 111 - Principles of Chemistry 1</td>
<td>4.0</td>
</tr>
<tr>
<td>CHEM 112 - Principles of Chemistry 2</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 113 - Introductory General Chemistry Laboratory</td>
<td>2.0</td>
</tr>
<tr>
<td>CHEM 201 - Chemical Handling and Safe Laboratory Practices</td>
<td>0.5</td>
</tr>
<tr>
<td>CHEM 227 - Principles of Chemical Analysis</td>
<td>4.0</td>
</tr>
<tr>
<td>CHEM 351H - Organic Chemistry 1 - Majors</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 352H - Organic Chemistry 2 - Majors</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 354 - Organic Chemistry Laboratory -- Majors</td>
<td>2.0</td>
</tr>
<tr>
<td>*CHEM 391 - Technical Writing Using Chemical Literature</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 495 - Senior Seminar</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Note:** With departmental approval, Chem 105 may substitute for Chem 111, and Chem 106 for Chem 112; and Chem 107 for Chem 113.

### REQUIREMENT 2 Complete 1 Option

#### OPTION 2.1 Complete 4 courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 468 - Biophysical Chemistry</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 481M - Biochemistry --Majors</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 584 - Advanced Biochemistry Methods 1</td>
<td>3.0</td>
</tr>
<tr>
<td>STAT 201 - Statistics for Engineers and Scientists</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**Note:** MATH 314 MAY SUBSTITUTE FOR CHEM 460.

#### OPTION 2.2 Complete 7 courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 460 - Mathematics for Physical Chemistry</td>
<td>1.0</td>
</tr>
<tr>
<td>CHEM 462 - Physical Chemistry 1</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 463 - Physical Chemistry 2</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 464 - Physical Chemistry Laboratory 1</td>
<td>1.0</td>
</tr>
<tr>
<td>CHEM 465 - Physical Chemistry Laboratory 2</td>
<td>1.0</td>
</tr>
<tr>
<td>MATH 213 - Elementary Linear Algebra</td>
<td>2.0</td>
</tr>
<tr>
<td>MATH 215 - Computational Linear Algebra</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Note:** MATH 214 MAY SUBSTITUTE FOR CHEM 460.

### REQUIREMENT 3 Complete 5 courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 112 - Calculus 1</td>
<td>4.0</td>
</tr>
<tr>
<td>MATH 113 - Calculus 2</td>
<td>4.0</td>
</tr>
<tr>
<td>PHYSCS 121 - Introduction to Newtonian Mechanics</td>
<td>3.0</td>
</tr>
<tr>
<td>PHYSCS 122 - Introduction to Waves, Optics, and Thermodynamics</td>
<td>3.0</td>
</tr>
<tr>
<td>PHYSCS 220 - Introduction to Electricity and Magnetism</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**Note:** Supporting courses suggested by most medical and dental schools are found by visiting the Preprofessional Advisement Center (ppa.byu.edu). The more rigorous chemistry, mathematics, and physics courses required for the chemistry majors will satisfy the minimum requirements listed there. Elective courses in biochemistry and in biological science are especially pertinent to these preprofessional programs.

### REQUIREMENT 4 Complete 3.0 hours from the following course(s)

**AFTER CONSULTING WITH AN ADVISOR, COMPLETE 3 HOURS FROM THE FOLLOWING:**

### REGISTRATION ADVISEMENT

We want to assist students in their academic pursuit toward an undergraduate degree. Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the number of semesters to graduate.

New students should attend the chemistry and biochemistry session during New Student Orientation, where they can meet with a faculty advisor and review their planned registration. Transfer or mid-year incoming students should meet with an advisor prior to the add/drop deadline of their first semester, usually after the first week of class.

The department recommends a review of progress and planned registration with a faculty advisor in the semester when 30, 60, and 90 hours are completed. However, academic advisement is available to all majors at any point in their academic career. Contact the department advisement office to schedule an appointment with a faculty advisor: in person C104 BNSN; by phone 801- 422-6269; by email suemort@chem.byu.edu or coffice@chem.byu.edu

### THE DISCIPLINE

The Chemistry Bachelor of Arts degree provides preparation for individuals in preprofessional programs (e.g., medicine, dentistry, business administration, or law). It also provides background for careers in chemistry-related professions (e.g., information specialist, safety engineer, forensics). Chemists and biochemists study the fundamental processes that govern the natural world, including atomic structure and how atoms interact to form molecules and materials. They study the mechanisms of chemical processes, including those that underpin living systems such as the transfer of information from DNA to RNA to proteins. They work to develop simplifying models (theories) that permit the correlation and explanation of observations about the behavior of life to the structure of rocks and minerals.
Chemistry and biochemistry provide an essential foundation for the medical sciences, engineering (especially chemical engineering), electronics, energy, environmental sciences, materials science, pharmacy, and virtually all manufacturing processes.

Chemistry and biochemistry are active branches of science that are vital to human existence. Inasmuch as the field embraces all aspects of the material world, it is subdivided into five areas of interest. Examples of these diverse areas include the regulation of protein synthesis, cellular signal transduction at the molecular level and proteomics (biochemistry), design and synthesis of medicinal compounds, catalysts and polymers (organic chemistry), design and synthesis of new molecular structures and materials (inorganic chemistry), spectroscopic study of energy transfer and molecular structures (physical chemistry), and analysis of medicinal compounds, biological materials, and contaminants or trace elements found in the environment (analytical chemistry).

Chemistry and biochemistry involve far more than test tubes and beakers. They include sophisticated methodologies such as recombinant DNA technology, working with a variety of instruments such as mass spectrometers, calorimeters, chromatographs, ultracentrifuges, lasers, X-ray diffractometers, electron microscopes and nuclear magnetic resonance spectrometers, all of which are used by undergraduate chemistry and biochemistry students at BYU. Computers also play an important role in these disciplines, with applications ranging from simulation of molecules and their interactions to the collection and analysis of data. The chemistry and biochemistry curricula are both rigorous and intellectually rewarding.

CAREER OPPORTUNITIES

Graduates in chemistry and biochemistry obtain positions in education and many different industries, performing analysis, synthesis, characterization, observation, and modeling. Those who work hard, are creative, and have intellectual curiosity are in particular demand. The discipline also provides an excellent preprofessional course of study for those interested in medicine, dentistry, law, and business.

MAP DISCLAIMER

While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

DEPARTMENT INFORMATION

Department of Chemistry and Biochemistry Advisement
Brigham Young University
C-104 BNSN
Provo, UT 84602
Telephone: (801) 422-6269

ADVICEMENT CENTER INFORMATION

Physical and Mathematical Sciences College Advisement Center
Brigham Young University
N-181 ESC
Provo, UT 84602
Telephone: (801) 422-2674