### UNIVERSITY CORE AND GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Core Enrichment: Electives</th>
<th>Requirement</th>
<th>#Classes</th>
<th>Hours</th>
<th>Classes</th>
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<tbody>
<tr>
<td>Religion Electives</td>
<td></td>
<td>3–4</td>
<td>6.0</td>
<td>from approved list</td>
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<tr>
<td>Open Electives</td>
<td></td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
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**GRADUATION REQUIREMENTS:**
- Minimum resident hours required: 30.0
- Minimum hours needed to graduate: 120.0

### PROGRAM REQUIREMENTS (80.5 total hours, including licensure hours)

#### Complete 9 hours from the following:
- **Bio 100** Principles of Biology 3.0
- Chem 331 Guided Learning for Chemistry Instruction 3.0
- Chem 463 Physical Chemistry 3.0
- Chem 481M Biochemistry Majors 3.0
- Geol 101 Introduction to Geology 3.0
- Geol 111 Physical Geography 4.0
- Math 290 Fundamentals of Mathematics 3.0
- Math 302 Mathematics for Engineering 4.0
- Math 313 Elementary Linear Algebra 3.0
- Math 334 Ordinary Differential Equations 3.0
- Phil 423 History & Philosophy of Science 3.0
- Phscs 127 Descriptive Astronomy 3.0
- Phscs 137 Severe and Hazardous Weather 3.0
- Phscs 140 Electronics Lab 1.0
- Phscs 145 Experimental Methods in Physics 1.0
- PWS 150 Environmental Biology 3.0

#### Complete the following licensure requirements:
- Contact the Education Advisement Center, 120 MCKB, 422-3426, to schedule the **final interview** to clear your application for the secondary teaching licence. You should be registered for your last semester at BYU prior to the scheduled appointment.

#### Complete the Professional Education Component:

**A. Complete the following:**
- CPSE 402 Educating Students w/ Disabilities 2.0
- IP&T 286 Instructional Technology in Teaching 1.0
- Phy S 276 Exploration of Teaching 4.0
- Phy S 377 Teaching Methods and Instruction 3.0
- Phy S 378 Practicum in Secondary Education 1.0
- Sc Ed 353 Multicultural Education 2.0
- Sc Ed 375 Adolescent Dev & Classroom Mgt 3.0

**Note:** FBI fingerprint and background clearance must be completed before enrollment into Phy S 276.

**B. Complete 12 hours from the following:**
- Sc Ed 476R Secondary Student-Teaching Internship 12.0
- Sc Ed 496R Academic Internship: Secondary Educ. 12.0
Suggested Sequence of Courses:

FRESHMAN YEAR**
1st Semester
Chem 111 (F) 4.0
First-year Writing 3.0
or A Htg 100 (3.0)
Math 112 (FWSpSu) 4.0
Religion Cornerstone course 2.0
Chem/Science/Math elective 3.0
Total Hours 16.0
2nd Semester
A Htg 100 or 3.0
First-year Writing (3.0)
Chem 112 (W) 3.0
Chem 113 (FW) 2.0
Math 201 0.5
Math 113 (FWSpSu) 4.0
Religion Cornerstone course 2.0
Open electives 0.5
Total Hours 15.0

SOPHOMORE YEAR**
3rd Semester
Chem 227 (FSp) 4.0
Chem 351M (F) 3.0
Phscs 121 (FWSpSu) 3.0
Religion Cornerstone course 2.0
Arts 3.0
Total Hours 15.0
4th Semester
Chem 352M (W) 3.0
Phscs 123 (FWSp) 3.0
Religion Cornerstone course 2.0
Chem/Science/Math elective 3.0
Social Science 3.0
Open electives 2.0
Total Hours 16.0

JUNIOR YEAR**
5th Semester
Chem 462 (F) 3.0
IP&T 286 1.0
Phy S 276R (FW) 4.0
Civilization I 3.0
Religion elective 2.0
Open electives 2.0
Total Hours 15.0
6th Semester
Chem 391 (FW) 3.0
Chem/Science/Math elective 3.0
Sc Ed 353 (FWSpSu) 2.0
Sc Ed 375 (FWSpSu) 3.0
Civ 2 & Letters (double count) 3.0
Religion elective 2.0
Total Hours 16.0

SENIOR YEAR**
7th Semester
Chem 495 1.0
Chem 497R or advanced lab elective 3.0
CPSE 402 2.0
Phy S 377 (FW) 3.0
Phy S 378 (FW) 1.0
Religion elective 2.0
Global and Cultural Awareness 3.0
Total Hours 15.0
8th Semester
Sc Ed 476R or 496R (FW) 12.0
Total Hours 12.0

**Note:** The department recommends a review of progress and planned registration with a faculty advisor by the end of the first week of classes in the first semester or term at BYU and in the semester when 30, 60, and 90 hours are completed. Call 422-6269 or come to C104 BNSN to schedule an appointment.

Note: 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 cost and the number of semesters to graduate.

THE DISCIPLINE:
The Chemistry Education Bachelor of Science degree provides preparation for chemistry/science high school teaching. High school chemistry teachers will find exciting opportunities available to help students take the first steps to becoming scientists. 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.

CAREER OPPORTUNITIES:
Graduates in chemistry and biochemistry obtain positions in virtually every industry, and those who have imagination and intellectual curiosity are in particular demand. The discipline also provide an excellent preprofessional course of study for those interested in medicine, dentistry, law, and business. The chemistry and biochemistry curricula are both rigorous and intellectually rewarding.

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