This major is designed to prepare students to teach in public schools. In order to graduate with this major, students are required to complete Utah State Office of Education licensing requirements. To view these requirements go to [http://education.byu.edu/ess/licensing.html](http://education.byu.edu/ess/licensing.html) or contact Education Student Services, 120 MCKB, (801) 422-3426.

### UNIVERSITY CORE AND GRADUATION REQUIREMENTS

#### UNIVERSITY CORE REQUIREMENTS

<table>
<thead>
<tr>
<th>Requirements</th>
<th>#Classes</th>
<th>Hours</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doctrinal Foundation</strong></td>
<td></td>
<td></td>
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<tr>
<td>Book of Mormon</td>
<td>2</td>
<td>4.0</td>
<td>Rel A 121/H and 122/H</td>
</tr>
<tr>
<td>New Testament</td>
<td>1</td>
<td>2.0</td>
<td>Rel A 211/H or 212/H</td>
</tr>
<tr>
<td>Doctrine and Covenants</td>
<td>1</td>
<td>2.0</td>
<td>Rel C 324/H or 325/H</td>
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<tr>
<td><strong>The Individual and Society</strong></td>
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<tr>
<td>Citizenship</td>
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<td></td>
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<tr>
<td>American Heritage</td>
<td>1–2</td>
<td>3–6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global &amp; Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>Sc Ed 353*</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
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<td></td>
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<tr>
<td>Effective Communication</td>
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</tr>
<tr>
<td>First-Year Writing</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Adv Written &amp; Oral Communication</td>
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<td>3.0</td>
<td>Chem 391*</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>0–1</td>
<td>0–4.0</td>
<td>Math 112* or 113*</td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1</td>
<td>4.0</td>
<td>Math 112* or 113*</td>
</tr>
<tr>
<td><strong>Arts, Letters, and Sciences</strong></td>
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<tr>
<td>Civilization 1 and 2</td>
<td>2</td>
<td>6.0</td>
<td>from approved list</td>
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<tr>
<td>Arts</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
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<tr>
<td>Letters</td>
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<td>3.0</td>
<td>Phil 423*</td>
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<tr>
<td><strong>Scientific Principles &amp; Reasoning</strong></td>
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<tr>
<td>Biological Science</td>
<td>1</td>
<td>3.0</td>
<td>Bio 100* or PWS 150*</td>
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<tr>
<td>Physical Science</td>
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<td>6.0</td>
<td>Chem 111* and PWS 121*, 123*</td>
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<tr>
<td>Social Science</td>
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<td>3.0</td>
<td>from approved list</td>
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<tr>
<td><strong>Core Enrichment: Electives</strong></td>
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<tr>
<td>Religion Electives</td>
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<td>6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
</tr>
</tbody>
</table>

**GRADUATION REQUIREMENTS:**
- **Minimum residence hours required:** 30.0
- **Minimum hours needed to graduate:** 120.0

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The content courses will not be accepted in the teaching major/minor. Teacher candidates must have a cumulative 2.85 GPA in teaching major/minor courses to qualify for student teaching. The Chemistry and Biochemistry Department requires the final 10 hours of required chemistry credit must be taken in residence at BYU for this degree program. These hours may also go toward BYU’s 30-hour residency requirement for graduation.

- Contact the Education Student Services Office for entrance requirements into the licensure program.
- A teaching minor is not required for licensure. However, it is strongly recommended.

**Complete the following:**
- Chem 111* Honors Principles of Chemistry 4.0
- Chem 112 Principles of Chemistry 3.0
- Chem 113 Introductory General Chemistry Lab 2.0
- Chem 201 Chemical Handling & Safe Lab Practices 0.5
- Chem 227 Principles of Chemical Analysis 4.0
- Chem 351M Organic Chemistry - Majors 3.0
- Chem 352M Organic Chemistry - Majors 3.0
- Chem 391* Tech. Writing Using Chemical Literature 3.0
- Chem 462 Physical Chemistry 3.0
- Chem 495 Senior Seminar 1.0

**Complete the following:**
- Math 112 Calculus 1 4.0
- Math 113 Calculus 2 3.0
- Phscs 121* Principles of Physics 1 3.0
- Phscs 123* Principles of Physics 2 3.0

**Complete 3 hours from the following:**
- Chem 354 Organic Chemistry Laboratory–Majors 2.0
- Chem 464 Physical Chemistry Laboratory 1 1.0
- Chem 465 Physical Chemistry Laboratory 2 1.0
- Chem 497R Undergraduate Special Problems 6.0

(See Education advisor for teaching related assignment.)

**Complete 9 hours from the following:**
- Bio 100* Principles of Biology 3.0
- Chem 331 Guided Learning for Chemistry Instruction 3.0 (continued in next column)

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

- Grades below C- in professional education courses or content courses will not be accepted in the teaching major/minor. Teacher candidates must have a cumulative 2.85 GPA in teaching major/minor courses to qualify for student teaching.
- Contact the Education Advisement Center, 120 MCKB, (801) 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 350 Adolescent Development 2.0
- Sc Ed 353* Multicultural Education 2.0
- Sc Ed 379 Classroom Management 1.0

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

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

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*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (22 hours overlap)*

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FOR UNIVERSITY CORE OR PROGRAM QUESTIONS CONTACT THE ADVISEMENT CENTER

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

Steven Goates, Faculty Advisor
C-104 BNSN, Brigham Young University, Provo, UT 84602
Telephone: (801) 422-6269
BS IN CHEMISTRY EDUCATION (692828)
2013–2014

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
Rel A 121 2.0
Chem/Science/Math elective 3.0
Total Hours 16.0

2nd Semester
A Htg 100 or
First-year Writing 3.0
Chem 112 (W) 3.0
Chem 113 (FW) 2.0
Chem 201 0.5
Math 113 (FWSpSu) 4.0
Rel A 122 2.0
Open electives 0.5
Total Hours 15.0

SOPHOMORE YEAR**
3rd Semester
Chem 227 (FSp) 4.0
Chem 351M (F) 3.0
Rel A 211/212 2.0
Arts 3.0
Total Hours 15.0

4th Semester
Chem 352M (W) 3.0
Phsccs 123 (FWSp) 3.0
Rel C 324/345 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 482 (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 350 (FWSpSu) 2.0
Sc Ed 353 (FWSpSu) 2.0
Civ 2 & Letters (double count) 3.0
Religion elective 2.0
Total Hours 15.0

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
Sc Ed 379 (FW) 1.0
Religion elective 2.0
Global and Cultural Awareness 3.0
Total Hours 16.0

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.

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.

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.

Department of Chemistry and Biochemistry
C104 BNSN
Brigham Young University, Provo, UT 84602
Telephone: (801) 422-3667