### 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>Religion Cornerstones</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td>1</td>
<td>2.0</td>
<td>REL A 275</td>
</tr>
<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
<td>1</td>
<td>2.0</td>
<td>REL A 250</td>
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<tr>
<td>Foundations of the Restoration</td>
<td>1</td>
<td>2.0</td>
<td>REL C 225</td>
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<tr>
<td>The Eternal Family</td>
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<td>2.0</td>
<td>REL C 200</td>
</tr>
<tr>
<td><strong>The Individual and Society</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Heritage</td>
<td>1-2</td>
<td>3.0-6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global and Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>SC ED 353*</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Year Writing</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Advanced Written and Oral Communications</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>1</td>
<td>3-4.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1</td>
<td>3.0</td>
<td>STAT 121*</td>
</tr>
<tr>
<td><strong>Arts, Letters, and Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civilization 1</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Civilization 2</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Arts</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Letters</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Biological Science</td>
<td>1</td>
<td>4.0</td>
<td>BIO 130*</td>
</tr>
<tr>
<td>Physical Science</td>
<td>2</td>
<td>7.0</td>
<td>CHEM 105*, PHSCS 105*</td>
</tr>
<tr>
<td>Social Science</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td><strong>Core Enrichment: Electives</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Religion Electives</td>
<td>3-4</td>
<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>

*Note: These classes fill both University Core and Program Requirements (16 hours overlap)*

#### Graduation Requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum residence hours required</td>
<td>30.0</td>
</tr>
<tr>
<td>Minimum hours needed to graduate</td>
<td>120.0</td>
</tr>
</tbody>
</table>

### Suggested Sequence of Courses

**FRESHMAN YEAR**

**1st Semester**
- First-year Writing or American Heritage: 3.0
- BIO 130: 4.0
- CHEM 105: 4.0
- Quantitative Reasoning (if needed): 0-3.0
- Religion Cornerstone course: 2.0
- General electives: 0-3.0
- **Total Hours**: 16.0

2nd Semester:
- A HTG 100 or 1st Year Writing: 3.0
- BIO 220: 4.0
- BIO 230: 4.0
- GEO 101: 3.0
- Religion Cornerstone course: 2.0
- **Total Hours**: 16.0

**Sophomore Year**

3rd Semester:
- BIO 235: 3.0
- SC ED 350 (F-2nd term): 2.0
- BIO 235: 3.0
- CHEM 105: 3.0
- Civilization 1 elective: 3.0
- Religion Cornerstone course: 2.0
- **Total Hours**: 16.0

4th Semester:
- BIO 350: 3.0
- MMDBIO 240: 3.0
- CPSE 402: 2.0
- SC ED 353: 3.0
- Civilization 2 elective: 3.0
- Religion Cornerstone course: 2.0
- **Total Hours**: 16.0

**Junior Year**

5th Semester:
- BIO 376 (F-1st term): 3.0
- SC ED 350 (F-2nd term): 2.0
- MMDBIO 240: 3.0
- CPSE 402: 2.0
- SC ED 353: 3.0
- Civilization 2 elective: 3.0
- Religion Cornerstone course: 2.0
- **Total Hours**: 16.0

6th Semester:
- CPSE 402: 2.0
- SC ED 353: 3.0
- Civilization 2 elective: 3.0
- Religion Cornerstone course: 2.0
- **Total Hours**: 16.0

**Senior Year**

7th Semester:
- BIO 470: 3.0
- BIO 441: 3.0
- STAT 122: 3.0
- IP&T 371: 1.0
- Religion elective: 2.0
- General electives: 2.0
- **Total Hours**: 15.0

8th Semester:
- Application for Bio 276 due by Aug 15.
- **Total Hours**: 16.0

**Note:** CPSE 402, SC Ed 350, 353 may be taken in any sequence.

Note: This degree program requires a minimum of 120 hours for graduation. 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.
**REQUIREMENT 1:** Complete 7 courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 130</td>
<td>Biology</td>
<td>4.0</td>
</tr>
<tr>
<td>BIO 220</td>
<td>Biological Diversity: Animals</td>
<td>4.0</td>
</tr>
<tr>
<td>BIO 230</td>
<td>Biological Diversity: Plants</td>
<td>4.0</td>
</tr>
<tr>
<td>BIO 350</td>
<td>Ecology</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 420</td>
<td>Evolutionary Biology</td>
<td>4.0</td>
</tr>
<tr>
<td>MMBio 240</td>
<td>Molecular Biology</td>
<td>3.0</td>
</tr>
<tr>
<td>PWS 340</td>
<td>Genetics</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**REQUIREMENT 2:** Complete 7 courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 235</td>
<td>Field Botany</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 380</td>
<td>Comparative Animal Physiology and Anatomy</td>
<td>4.0</td>
</tr>
<tr>
<td>BIO 441</td>
<td>Entomology</td>
<td>3.0</td>
</tr>
<tr>
<td>*CHEM 105</td>
<td>General College Chemistry 1 with Lab (Integrated)</td>
<td>4.0</td>
</tr>
<tr>
<td>GEOL 101</td>
<td>Introduction to Geology</td>
<td>3.0</td>
</tr>
<tr>
<td>*PHSCS 105</td>
<td>General Physics 1</td>
<td>3.0</td>
</tr>
<tr>
<td>*STAT 121</td>
<td>Principles of Statistics</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**REQUIREMENT 3:** Complete 1 course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>BIO 470</td>
<td>History and Philosophy of Biology</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**REQUIREMENT 4:** Complete 2 options

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

### BIOLOGY CORE:

*Note: BIO 420, 421 MUST BE TAKEN AT BYU.*

#### OPTION 4.1

Complete 10 courses

- BIO 276: Exploration of Teaching in Biological Sciences 3.0
- BIO 377: Teaching Methods and Instruction in Biology 3.0
- BIO 378: Practicum in Biology Teaching 1.0
- BIO 379: Classroom Management and Laboratory Safety 1.0
- CPSE 402: Educating Students with Disabilities in Secondary Classroom 2.0
- IP&T 371: Integrating K-12 Educational Technology 1.0
- IP&T 372: Integrating K-12 Educational Technology 1.0
- IP&T 373: Teaching in K-12 Online and Blended Learning Contexts 1.0
- SC ED 350: Adolescent Development in an Education Context 2.0
- *SC ED 353: Multicultural Education for Secondary Education* 3.0

**Note 1:** Application on educator.byu.edu, including FBI fingerprint and background clearance, must be completed prior to enrollment in Bio 276.

**Note 2:** Bio 377, 378, and 379 should be taken concurrently in the semester prior to taking Bio 476.

**Note 3:** Most states require the Biology Praxis Exam for employment in High School and the Middle Level Science Praxis Exam for teaching in grades 6-8.

#### OPTION 4.2

Complete 12.0 hours from the following course(s)

- BIO 476: Biology Student Teaching 12.0
- BIO 496R: Secondary Teaching Internship 12.0

**You may take up to 12 credit hours.**

**RECOMMENDED Complete 12 courses**

**ALTHOUGH NOT REQUIRED, THESE COURSES ARE RECOMMENDED.**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 430</td>
<td>Plant Classification and Identification</td>
<td>4.0</td>
</tr>
<tr>
<td>BIO 443</td>
<td>Ichthyology</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 445</td>
<td>Herpetology</td>
<td>4.0</td>
</tr>
<tr>
<td>BIO 447</td>
<td>Mammalogy</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 452</td>
<td>Marine Biology</td>
<td>4.0</td>
</tr>
<tr>
<td>BIO 463</td>
<td>Genetics of Human Disease</td>
<td>3.0</td>
</tr>
<tr>
<td>GEOL 103</td>
<td>Life of the Past</td>
<td>3.0</td>
</tr>
<tr>
<td>GEOL 113</td>
<td>Historical Geology</td>
<td>4.0</td>
</tr>
<tr>
<td>MATH 112</td>
<td>Calculus 1</td>
<td>3.0</td>
</tr>
<tr>
<td>PHSCS 127</td>
<td>Descriptive Astronomy</td>
<td>3.0</td>
</tr>
<tr>
<td>PWS 282</td>
<td>Soil Science</td>
<td>3.0</td>
</tr>
<tr>
<td>PWS 283</td>
<td>Soil Science Laboratory</td>
<td>1.0</td>
</tr>
<tr>
<td>PWS 446</td>
<td>Ornithology</td>
<td>3.0</td>
</tr>
</tbody>
</table>

### PROFESSIONAL EDUCATION COMPONENT:

#### OPTION 4.1

- HISTORY AND PHILOSOPHY OF BIOLOGY
- ENTOMOLOGY
- COMPARATIVE ANIMAL PHYSIOLOGY AND ANATOMY
- FIELD BOTANY
- EVOLUTIONARY BIOLOGY
- MOLECULAR BIOLOGY
- GENETICS

#### OPTION 4.2

- TEACHING JUNIOR AND SENIOR HIGH SCHOOL STUDENTS ABOUT THE DISCIPLINE
- UNDERSTANDING BIOLOGY AND ZOOLOGY
- UNDERSTANDING CHEMISTRY
- UNDERSTANDING PHYSICS
- UNDERSTANDING BIOETHICAL CONCERNS
- UNDERSTANDING SCIENCE, SOCIETY, AND TECHNOLOGY
- UNDERSTANDING THE RESULTING BIOETHICAL CONCERNS

### THE DISCIPLINE:

Biological Science Education (BSE) program is designed to prepare students to teach in public schools. Students wishing to enter the Biological Science Education (BSE) program must declare the premajor, complete Bio 130, Bio 220, Chem 105, and Bio 276, and meet and maintain minimum GPA requirements of 2.85 in the major and 3.0 cumulative. For additional details on admission and retention requirements for teaching majors and teaching minors, see Educator Preparation Program Requirements in the Undergraduate Catalog.

**STUDENT TEACHING AND INTERNSHIPS:**

Student teaching is normally completed during the senior year and must occur within the state of Utah. Some half-salary teaching internships are available annually. The intern experience counts for student-teaching credit. Applications for winter student teaching are due Sept. 15.

### APPLICATION TO PROGRAM:

Admission to teaching program is by application. All candidates must be declared Biological Science Education pre-majors prior to application. All students are required to have a minimum GPA of 3.0 with no grade lower than a C in any required class. The following classes must be taken prior to Bio 276: Bio 130, Bio 220, and Chem 105. Application is found at https://educator.byu.edu.

### FINANCING:

Many undergraduate students work about 20 hours per week. Upper-class students may work as assistants in the science education teaching and research programs. These assistantships are only available after students have successfully completed Bio 276.
CAREERS:
The Biological Science Education major prepares students specifically for teaching life sciences in public and private schools. At the high school level this includes general biology, anatomy, physiology, botany, zoology, AP biology and many other life science subjects. At the junior high school level this includes life science and general or integrated science. Students completing the program are licensed and endorsed to teach in the State of Utah. This license easily transfers to most other states.

Many teachers have summer jobs in fields related to biology teaching. This includes work with the Forest Service, Wildlife Division, Park Service, city summer recreation programs, etc. Teachers may also obtain employment in informal education settings, such as science museums, zoos, etc.

This major also provides a foundation for obtaining advanced degrees in the sciences or education that would enable students to teach in higher education or work as a school counselor, administrator, or district/state science specialist.

FACILITIES:
Science education facilities at BYU include a science education laboratory and teaching area.

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.

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