BS in Biological Science Education (282024) MAP Sheet
Life Sciences, Biology

For students entering the degree program during the 2020-2021 curricular year.
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/advisement/licensure or contact Education Student Services, 350 MCKB, (801) 422-3426.

### 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>1</td>
<td>2.0</td>
<td>REL A 275</td>
</tr>
<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td>1</td>
<td>2.0</td>
<td>REL A 250</td>
</tr>
<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
<td>1</td>
<td>2.0</td>
<td>REL C 225</td>
</tr>
<tr>
<td>Foundations of the Restoration</td>
<td>1</td>
<td>2.0</td>
<td>REL C 200</td>
</tr>
<tr>
<td>The Eternal Family</td>
<td>1</td>
<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>3-6.0</td>
<td>SC ED 353*</td>
</tr>
<tr>
<td>Global and Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>STAT 121*</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></td>
</tr>
<tr>
<td>Advanced Written and Oral Communications</td>
<td>1</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>1</td>
<td>3-4.0</td>
<td></td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1</td>
<td>3.0</td>
<td></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></td>
</tr>
<tr>
<td>Civilization 2</td>
<td>1</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Arts</td>
<td>1</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Letters</td>
<td>1</td>
<td>3.0</td>
<td></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></td>
</tr>
<tr>
<td><strong>Core Enrichment: Electives</strong></td>
<td>3-4</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Religion Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
</tr>
<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
</tr>
</tbody>
</table>

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (16 hours overlap)*

### Graduation Requirements

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

### Suggested Sequence of Courses

<table>
<thead>
<tr>
<th>YEAR</th>
<th>SEMESTER</th>
<th>1st Semester</th>
<th>2nd Semester</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRESHMAN YEAR</strong></td>
<td>1st Semester</td>
<td><strong>JUNIOR YEAR</strong></td>
<td>5th Semester</td>
<td></td>
</tr>
<tr>
<td><strong>1st Semester</strong></td>
<td>First-year Writing or American Heritage</td>
<td>3.0</td>
<td>BIO 380</td>
<td>4.0</td>
</tr>
<tr>
<td>BIO 130</td>
<td>3.0</td>
<td>BIO 441</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>CHEM 105</td>
<td>4.0</td>
<td>STAT 221</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Quantitative Reasoning (if needed)</td>
<td>0-3.0</td>
<td>IP&amp;T 371</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
<td>Religion elective</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>General electives</td>
<td>0-3.0</td>
<td>General electives</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td>16.0</td>
<td><strong>Total Hours</strong></td>
<td>15.0</td>
<td></td>
</tr>
<tr>
<td><strong>2nd Semester</strong></td>
<td>A HTG 100 or 1st Year Writing</td>
<td>3.0</td>
<td>BIO 470</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 220</td>
<td>4.0</td>
<td>PWS 340</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>BIO 230</td>
<td>4.0</td>
<td>IP&amp;T 372</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>GEOL 101</td>
<td>3.0</td>
<td>IP&amp;T 373</td>
<td>1.0</td>
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<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
<td>Religion elective</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>16.0</strong></td>
<td><strong>Total Hours</strong></td>
<td>16.0</td>
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- Application for Bio 276 due by Aug 15.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>SEMESTER</th>
<th>3rd Semester</th>
<th>4th Semester</th>
<th>Total Hours</th>
</tr>
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<tbody>
<tr>
<td><strong>SOPHOMORE YEAR</strong></td>
<td>3rd Semester</td>
<td><strong>JUNIOR YEAR</strong></td>
<td>7th Semester</td>
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<tr>
<td><strong>3rd Semester</strong></td>
<td>BIO 276 (F-1st term)</td>
<td>3.0</td>
<td>BIO 380</td>
<td>12.0</td>
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<tr>
<td>SC ED 350 (F-2nd term)</td>
<td>2.0</td>
<td>BIO 377, 378, 379</td>
<td>5.0</td>
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<tr>
<td>BIO 225</td>
<td>3.0</td>
<td>BIO 420</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>PHSCS 105</td>
<td>3.0</td>
<td>Arts or Letters elective</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Civilization 1 elective</td>
<td>3.0</td>
<td>Religion elective</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
<td>Social Science elective</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>16.0</strong></td>
<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
<td></td>
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<tr>
<td><strong>4th Semester</strong></td>
<td><strong>16.0</strong></td>
<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
<td></td>
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<tr>
<td>BIO 350</td>
<td>3.0</td>
<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
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<tr>
<td>MMBIO 240</td>
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<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
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<tr>
<td>CPSE 402</td>
<td>2.0</td>
<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
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<tr>
<td>SC ED 353</td>
<td>3.0</td>
<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
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<tr>
<td>Civilization 2 elective</td>
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<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
<td></td>
</tr>
<tr>
<td>Religion cornerstone course</td>
<td>2.0</td>
<td><strong>Total Hours</strong></td>
<td><strong>17.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

*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.
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 https://www.schools.utah.gov/curr/licensing or contact the Education Advisement Center, 350 MCKB, 801-422-3426.

For students accepted into the major after December 16, 2019, grades below C in any required coursework in a teaching major or teaching minor will not be accepted. Teacher candidates must maintain a cumulative GPA of 2.7 or higher once admitted into the program and to qualify for student teaching. For additional details on admission and retention requirements for teaching majors and teaching minors, see Educator Preparation Program Requirements in the Undergraduate Catalog.

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, prior to making application via educator.byu.edu. Students obtaining a teaching minor must also student teach at least one period in the minor, when available.

**REQUIREMENT 1** Complete 7 courses

**BIOLOGY CORE. NOTE: BIO 420, 421 MUST BE TAKEN AT BYU.**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</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 410</td>
<td>Evolutionary Biology</td>
<td>4.0</td>
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<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>
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**REQUIREMENT 2** Complete 7 courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BIO 235</td>
<td>Field Botany</td>
</tr>
<tr>
<td>BIO 380</td>
<td>Comparative Animal Physiology and Anatomy</td>
</tr>
<tr>
<td>BIO 441</td>
<td>Entomology</td>
</tr>
<tr>
<td>*CHEM 105</td>
<td>General College Chemistry 1 with Lab (Integrated)</td>
</tr>
<tr>
<td>*PHSCS 105</td>
<td>General Physics 1</td>
</tr>
<tr>
<td>*STAT 121</td>
<td>Principles of Statistics</td>
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**REQUIREMENT 3** Complete 1 course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>BIO 470</td>
<td>History and Philosophy of Biology</td>
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**REQUIREMENT 4** Complete 2 options

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>BIO 471</td>
<td>History and Philosophy of Biology</td>
</tr>
<tr>
<td>BIO 472</td>
<td>History and Philosophy of Biology</td>
</tr>
<tr>
<td>BIO 473</td>
<td>History and Philosophy of Biology</td>
</tr>
<tr>
<td>BIO 474</td>
<td>History and Philosophy of Biology</td>
</tr>
<tr>
<td>BIO 475</td>
<td>History and Philosophy of Biology</td>
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### PROFESSIONAL EDUCATION COMPONENT:

#### OPTION 4.1 Complete 10 courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 276</td>
<td>Exploration of Teaching in Biological Sciences</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 377</td>
<td>Teaching Methods and Instruction in Biology</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 378</td>
<td>Practicum in Biology Teaching</td>
<td>1.0</td>
</tr>
<tr>
<td>BIO 379</td>
<td>Classroom Management and Laboratory Safety</td>
<td>1.0</td>
</tr>
<tr>
<td>CPSE 402</td>
<td>Educating Students with Disabilities in Secondary Classro</td>
<td>2.0</td>
</tr>
<tr>
<td>IP&amp;T 371</td>
<td>Integrating K-12 Educational Technology 1</td>
<td>1.0</td>
</tr>
<tr>
<td>IP&amp;T 372</td>
<td>Integrating K-12 Educational Technology 2</td>
<td>1.0</td>
</tr>
<tr>
<td>IP&amp;T 373</td>
<td>Teaching in K-12 Online and Blended Learning Contexts</td>
<td>1.0</td>
</tr>
<tr>
<td>SC ED 350</td>
<td>Adolescent Development in an Education Context</td>
<td>2.0</td>
</tr>
<tr>
<td>*SC ED 353</td>
<td>Multicultural Education for Secondary Education</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**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 Praxis Exam for teaching in grades 6-8.

#### OPTION 4.2 Complete 12.0 hours from the following course(s)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIO 476</td>
<td>Biology Student Teaching</td>
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</tr>
<tr>
<td>BIO 496R</td>
<td>Secondary Teaching Internship</td>
<td>12.0</td>
</tr>
</tbody>
</table>

You may take up to 12 credit hours.

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### RECOMMENDED Complete 12 courses

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</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>
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</tr>
<tr>
<td>GEOL 112</td>
<td>Historical Geology</td>
<td>4.0</td>
</tr>
<tr>
<td>MATH 112</td>
<td>Calculus I</td>
<td>4.0</td>
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<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>
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</tbody>
</table>

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### THE DISCIPLINE:

Biology teachers can help students in public schools catch a vision of the exciting future in biology. Students study both the discipline of biology and the techniques of science education. Teaching junior and senior high school students about the broad areas of biology requires an understanding of botany, molecular biology and zoology. Biology teachers must have exposure and limited expertise in chemistry, physics, mathematics and geology. Biology teachers also must understand how to plan and carry out lab investigations, field trips and multi disciplinary activities that bring junior and senior high school students into the study of biology. Their role is to help students see the inter-relationships among science, society, and technology and the resulting bioethical concerns.

### 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:
This major prepares students specifically for teaching life sciences in public schools. At the high school level this could include general biology, anatomy, physiology, botany, zoology, AP biology and many other life science subjects. At the junior high school level this could include life science and general science.

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.

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.

DEPARTMENT INFORMATION
Department of Biology
Brigham Young University
4101 Life Sciences Building
Provo, UT 84602
Telephone: (801) 422-2582

ADVISEMENT CENTER INFORMATION
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Telephone: (801) 422-3042

Josh Stowers
Brigham Young University
2122 Life Sciences Building
Provo, UT 84602
Telephone: (801) 422-0873