BS in BIOLOGY (282022) Map Sheet  
Department of Biology  
For students entering the degree program during the 2012–2013 curricular year.

<table>
<thead>
<tr>
<th>UNIVERSITY CORE AND GRADUATION REQUIREMENTS</th>
<th>PROGRAM REQUIREMENTS (65–69.0 total hours*)</th>
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<td><strong>UNIVERSITY CORE REQUIREMENTS</strong></td>
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<td>Requirement</td>
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<td>Book of Mormon</td>
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<td>New Testament</td>
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<td>Doctrine and Covenants</td>
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<td>Effective Communication</td>
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<td>First-Year Writing</td>
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<td>Adv Written &amp; Oral Communication</td>
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<td>Civilization 1 and 2</td>
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<td>Social Science</td>
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<td><strong>GRADUATION REQUIREMENTS:</strong></td>
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<td>Minimum residence hours required</td>
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<td>Minimum hours needed to graduate</td>
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*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (16.0 hours overlap)

**Complete the following:**
- Bio 130* Biology 4.0
- Bio 220A Biological Diversity: Animals 4.0
- Bio 220B Biological Diversity: Plants 4.0
- Bio 350 Ecology 3.0
- Bio 420 Evolutionary Biology 2.0
- Bio 421 Evolutionary Biology Lab 1.0
- MMBio 240 Molecular Biology 3.0
- PWS 340 Genetics 2.0

**Complete one course from the following:**
- Bio 347 Religion and the Environment 3.0
- Bio 370 Bioethics 2.0
- Bio 470 Hist and Philosophy of Biology 3.0

**Complete the following:**
- Chem 105* General College Chemistry 4.0
- Chem 106 General College Chemistry 3.0
- Chem 107 General College Chemistry Lab 1.0
- Chem 351 Organic Chemistry 3.0
- Chem 352 Organic Chemistry 3.0
- Chem 353 Organic Chemistry Lab 2.0V

**Complete one of the following options:**
- a. Complete the following:
  - Math 112* Calculus 1 4.0
  - Math 113 Calculus 2 4.0
  - Stat 201 Stats for Engineers & Scientists 3.0
  - and complete one course from the following:
    - Stat 151 Intro to Bayesian Statistics 3.0
    - Stat 230 Analysis of Variance 3.0
    - (Recommended)
    - Stat 234 Methods of Survey Sampling 3.0
    - Stat 240 Discrete Probability 3.0
  - b. Complete the following:
    - Math 112* Calculus 1 4.0
    - Phscs 121* Principles of Physics 1 3.0
    - Phscs 123 Principles of Physics 2 3.0
    - Stat 201 Stats for Engineers & Scientists 3.0
  - c. Complete the following:
    - Math 112* Calculus 1 4.0
    - Phscs 105* Introductory Applied Physics 3.0
    - Phscs 106 Introductory Applied Physics 3.0
    - Phscs 107 Introductory Applied Physics Lab 1.0
    - Phscs 108 Introductory Applied Physics Lab 1.0
    - Stat 201 Stats for Engineers & Scientists 3.0

**Complete a total of 12 hours of electives, a minimum of five hours from the organismal biology list (a), a minimum of five hours from the biological processes list (b), and as an option, up to two hours of approved mentoring credit (c).**
- a. Organismal biology: complete a minimum of five hours from the following:
  - Bio 352, 430, 441, 442, 443, 445, 446, 447, 510, 511, 512, 541
  - MMBio 465
- b. Biological processes: complete a minimum of five hours from the following:
  - Chem 481
  - MMBio 461, 462
  - PDBio 360, 362
  - PWS 440

**Complete an exit interview.**

**Recommended Courses for Career Options**

**Botany**

Students seeking career and graduate school opportunities in botanical fields should build their electives on a foundation of basic plant biology courses. Coupled with the broad integrative biology core, the following courses provide students with the greatest diversity of options for postgraduate work or training in plant biology:
- Bio 430, 510, 511, 512
- PWS 282, 283, 355, 440, 515.

Students completing Bio 430, PWS 330 and 355 often find summer employment opportunities with government land agencies.

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BS in BIOLOGY (282022)
2012–2013

**Preveterinary Medicine**

Students interested in applying to veterinary medicine schools should take the following courses as part of the biology major:

- Bio 270, 291R, 392R, 525
- Chem 351, 352, 353, 481
- Engl 316
- Math 119
- MMBio 221, 222
- NDFS 330
- PDBio 484
- Stat 221
- TMA 150

**Suggested Sequence of Courses:**

**FRESHMAN YEAR**

1st Semester
- Bio 130 (FW) (Biological Science) 4.0
- Chem 105 (FWSpSu) 4.0
- A Htg 100 or First-Year Writing (3.0)
- Quantitative Reasoning (if needed) 0–3.0
- Rel A 121 (FWSpSu) 2.0

**Total Hours 13–16.0**

2nd Semester
- A Htg 100 (FWSpSu) 3.0
- or First-Year Writing (3.0)
- Civilization 1 elective 3.0
- Chem 106, 107 (FWSpSu) 4.0
- Math 112 (FWSpSu) (Lang. of Learning) 4.0
- Rel A 122 (FWSpSu) 2.0

**Total Hours 16.0**

**SOPHOMORE YEAR**

3rd Semester
- Bio 220A (FW) 4.0
- Math 113 (if needed) 0–4.0
- Phsces 105, 107 or 121 (FWSpSu) 3.0–4.0
- (Physical Science)
- Civilization 2 elective 3.0
- Rel A 211 or 212 (FWSpSu) 2.0

**Total Hours 12–17.0**

4th Semester
- MMBio 240 (FW) 3.0
- Phsces 106, 108 or 123 (FWSpSu) 3.0–4.0
- Arts or Letters elective (FWSpSu) 3.0
- Rel C 324 or 325 (FWSpSu) 2.0
- Social Science elective 3.0
- General elective 2.0

**Total Hours 16–17.0**

**JUNIOR YEAR**

5th Semester
- Chem 351 3.0
- PWS 340 3.0
- Bio 347, 370, or 470 2.0
- Biology elective 2.0
- Arts or Letters elective 3.0
- Religion elective 2.0

**Total Hours 15.0**

6th Semester
- Chem 352 3.0
- Chem 353 1.0
- Stat 201 3.0
- Biology elective 3.0
- Religion elective 2.0
- General elective (if needed) 2.0–4.0

**Total Hours 14–16.0**

**SENIOR YEAR**

7th Semester
- Bio 350 (FW) 3.0
- Bio 220B (FW) 3.0
- Biology elective 3.0
- Stat 151, 230, 234, or 240 3.0
- Adv. Written & Oral Communication 3.0
- Religion elective 2.0

**Total Hours 17.0**

8th Semester
- Bio 420 2.0
- Bio 421 1.0
- Biology electives 6.0
- Global & Cultural Awareness elective 3.0
- General electives 3.0

**Total Hours 15.0**

**THE DISCIPLINE:**

The biology degree provides students with current, practical knowledge of plants and animals, emphasizing whole organism biology in both ecological and evolutionary contexts. Broad, synthetic training, from molecular to community levels of organization, equips students to address critical issues and contemporary biological problems associated with the long-term preservation of earth’s biodiversity. Elective flexibility allows students to emphasize the botanical or zoological fields, or create a combined program of study. Undergraduate research opportunities may include internships, museum collections curation, bioinventory and database activities, applied molecular genetics, and field and laboratory research in ecology, conservation biology, and evolutionary biology.

**RESEARCH OPPORTUNITIES:**

One objective of this program is to provide solid preparation for post graduate studies. For that reason students should take advantage of research opportunities. Department faculty conduct field and laboratory research on diverse topics (including genetics of human diseases, conservation biology, molecular systematics, evolution of life history strategies, biogeographical ecology, bioinventories, aquatic ecology, and bioassessment).

Undergraduates have studied black bears in Utah, mouse systematics in Mexico, stonelfy and trout biogeography in the western U.S., turtles in Amazonia, insects in Borneo, and fish predation in the Provo River. The mentoring option allows up to 4 hours of Bio 399R, 494R, and 559R research credit to substitute elective hours in the Organismal Biology and Biological Processes lists (as approved by a faculty mentor).

**CAREERS:**

Post-graduate study in a wide-variety of sub disciplines in biology (molecular biology, genetics, ecology, evolutionary biology, conservation biology, etc.), as well as preparation for medical or dental school. Students may also pursue employment as a biologist in state and federal agencies, non-government organizations, and research laboratories.

Students in this major may apply for university, college, and departmental scholarships. A number of research or teaching assistant positions for undergraduate students also exist.

**FINANCING:**

Students in this major may apply for university, college, and departmental scholarships. A number of research or teaching assistant positions for undergraduate students also exist.

**PROFESSIONAL TRAINING, INTERNSHIPS, CO-OP EDUCATION, AND PRACTICAL EXPERIENCE:**

Undergraduates can seek paid positions in research laboratories. Cooperative programs with the U.S. Forest Service and the U.S. Fish and Wildlife Service may be available, as is summer employment with state and federal agencies. This can lead to permanent employment. Completing Bio 430, PWS 330 and 355 can increase summer employment options with government agencies.

**Note:** This degree program requires a minimum of 120.0 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.

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