### 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>Religion Cornerstones</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td></td>
<td></td>
<td>REL A 275</td>
</tr>
<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
<td></td>
<td></td>
<td>REL A 250</td>
</tr>
<tr>
<td>Foundations of the Restoration</td>
<td>1</td>
<td></td>
<td>REL C 225</td>
</tr>
<tr>
<td>The Eternal Family</td>
<td>1</td>
<td></td>
<td>REL C 200</td>
</tr>
<tr>
<td>The Individual and Society</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Heritage</td>
<td>1-2</td>
<td>3-6</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global and Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Skills</td>
<td>1</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</td>
<td>from approved list</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>Arts, Letters, and Sciences</td>
<td>1</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* plus one course from approved list</td>
</tr>
<tr>
<td>Social Science</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Core Enrichment: Electives</td>
<td>3-4</td>
<td>6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Religion Electives</td>
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</tr>
<tr>
<td>Open Electives</td>
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</tr>
</tbody>
</table>

*THESE CLASSES FULL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (12 hours overlap)*

#### Graduation Requirements:

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

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### Suggested Sequence of Courses

#### FRESHMAN YEAR

- **1st Semester**
  - BIO 130: 4.0
  - BIO 165: 3.0
  - First-year Writing or American Heritage: 3.0
  - Social Science elective: 3.0
  - Religion Cornerstone course: 2.0
- **Total Hours**: 15.0

- **2nd Semester**
  - CS 142: 3.0
  - CHEM 105: 4.0
  - A HTG or First-Year Writing: 3.0
  - General elective: 3.0
  - Religion Cornerstone course: 2.0
- **Total Hours**: 15.0

#### SOPHOMORE YEAR

- **3rd Semester**
  - CS 235: 3.0
  - MNBIO 240: 3.0
  - MATH 112: 4.0
  - CHEM 106: 3.0
  - Religion Cornerstone course: 2.0
- **Total Hours**: 15.0

- **4th Semester**
  - CS 236: 2.0
  - Arts or Letters elective: 3.0
  - Global & Cultural Awareness: 3.0
  - General elective: 3.0
  - Religion Cornerstone course: 2.0
- **Total Hours**: 16.0

#### JUNIOR YEAR

- **5th Semester**
  - BIO 365: 3.0
  - CS 240: 4.0
  - PWS 340: 3.0
  - Arts or Letters elective: 3.0
- **Total Hours**: 13.0

- **6th Semester**
  - CS 312: 3.0
  - Adv. Written and Oral Communication: 3.0
  - General elective: 4.0
  - Religion elective: 2.0
  - Major elective: 3.0
- **Total Hours**: 15.0

#### SENIOR YEAR

- **7th Semester**
  - Major electives: 6.0
  - Civilization 1 elective: 3.0
  - Religion elective: 2.0
  - General elective: 4.0
- **Total Hours**: 15.0

- **8th Semester**
  - BIO 465: 3.0
  - Major elective: 3.0
  - Civilization 2 elective: 3.0
  - General electives: 5.0
- **Total Hours**: 16.0

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.
BS in Bioinformatics (282021)
2020-2021 Program Requirements (60 - 62 Credit Hours)

**REQUIREMENT 1** Complete 6 courses

- **BIO 130** - Biology
- **BIO 165** - Introduction to Bioinformatics
- **BIO 365** - Quantitative Biology
- **BIO 465** - Capstone in Bioinformatics
- **MBIO 240** - Molecular Biology
- **PWS 340** - Genetics

**REQUIREMENT 2** Complete 1 course

- **BIO 250** - Evolutionary Medicine
- **BIO 420** - Evolutionary Biology

**REQUIREMENT 3** Complete 8 courses

- **C S 142** - Introduction to Computer Programming
- **C S 235** - Data Structures and Algorithms
- **C S 236** - Discrete Structures
- **C S 240** - Advanced Programming Concepts
- **C S 312** - Algorithm Design and Analysis
- **CHEM 105** - General College Chemistry 1 with Lab (Integrated)
- **CHEM 106** - General College Chemistry 2
- **MATH 112** - Calculus 1

**REQUIREMENT 4** Complete 12.0 hours from the following course(s)

**NOTE:** Up to 2 TOTAL CREDIT HOURS OF BIO 194 AND BIO 494R ALLOWED.
**NOTE:** EITHER BIO 370 OR PHIL 212R CAN BE USED TO PARTIALLY FULLFILL THIS REQUIREMENT, BUT NOT BOTH.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 194</td>
<td>Introduction to Mentored Research</td>
<td>0.5</td>
</tr>
<tr>
<td>BIO 316</td>
<td>Advanced Scientific Writing and Communication</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 350</td>
<td>Ecology</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 370</td>
<td>Bioethics</td>
<td>2.0</td>
</tr>
<tr>
<td>BIO 450</td>
<td>Capstone in Biodiversity and Conservation</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 463</td>
<td>Genetics of Human Disease</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 468</td>
<td>(Bio-MMBio-PWS) Genomics</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 494R</td>
<td>Mentored Research</td>
<td>6.0v</td>
</tr>
<tr>
<td>BIO 530</td>
<td>Advanced Genetic Analysis</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 555</td>
<td>Evolutionary and Ecological Modeling</td>
<td>2.0</td>
</tr>
<tr>
<td>BIO 560</td>
<td>Population Genetics</td>
<td>4.0</td>
</tr>
<tr>
<td>C S 340</td>
<td>Software Design</td>
<td>3.0</td>
</tr>
<tr>
<td>C S 418</td>
<td>(Not currently offered)</td>
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</tr>
<tr>
<td>C S 450</td>
<td>Computer Vision</td>
<td>3.0</td>
</tr>
<tr>
<td>C S 452</td>
<td>Database Modeling Concepts</td>
<td>3.0</td>
</tr>
<tr>
<td>C S 470</td>
<td>Introduction to Artificial Intelligence</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**THE DISCIPLINE:**
Bioinformatics is an interdisciplinary program offering substantial training in both the biological sciences and the physical and mathematical sciences with an emphasis on computer programming coupled with genetics and molecular biology. Students are expected to acquire programming, database, and operating system skills coupled with a foundation in mathematics and statistics. In addition, students will be well trained in molecular biology and genetics and can pursue individual interests in a variety of areas (chemistry, physics, bioengineering, computer science, molecular biology, genetics, etc.).

**RESEARCH OPPORTUNITIES:**
Undergraduates majoring in bioinformatics are expected to participate in research training both on and off campus. The bioinformatics faculty has substantial research programs in phylogenetics, biophysics, ecological modeling, and proteomics with developing programs in biodiversity informatics and biotechnology/agricultural genomics.

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

**MAP DISCLAIMER**
While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed...
BS in Bioinformatics (282021)
2020-2021

requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

DEPARTMENT INFORMATION
Department of Biology
Brigham Young University
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Provo, UT 84602
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ADVISEMENT CENTER INFORMATION
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