**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>1-2</td>
<td>3.0-6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>American Heritage</td>
<td>1</td>
<td>3.0</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></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>American Heritage</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>1</td>
<td>3.0</td>
<td>STAT 121 * recommended</td>
</tr>
<tr>
<td>Languages of Learning</td>
<td>1</td>
<td>3.0</td>
<td>STAT 121 *</td>
</tr>
<tr>
<td>Arts, Letters, and Sciences</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>3.0</td>
<td>MMBIO 240 *</td>
</tr>
<tr>
<td>Physical Science</td>
<td>2</td>
<td>7.0</td>
<td>CHEM 105 * + 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>
</tbody>
</table>

### Core Enrichment: Electives

| Religion Electives | 3-4 | 6.0 | from approved list |
| Open Electives     | Variable | Variable | personal choice |

* THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (10 hours overlap)
** PHSCS 105 RECOMMENDED

FOR UNIVERSITY CORE QUESTIONS CONTACT THE ADVISEMENT CENTER — FOR PROGRAM QUESTIONS SEE YOUR FACULTY ADVISOR

### 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

<table>
<thead>
<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>First-year Writing or American Heritage</td>
<td>3.0</td>
</tr>
<tr>
<td>Arts or Letters</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 105</td>
<td>4.0</td>
</tr>
<tr>
<td>PDBIO 120 or MMBIO 121</td>
<td>3.0</td>
</tr>
<tr>
<td>Total Hours</td>
<td>15.0</td>
</tr>
</tbody>
</table>

#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>Physical Science</td>
<td>3.0</td>
</tr>
<tr>
<td>BIO 165 or MMBIO 240</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 351 (GG) or ACC 200 (BB)</td>
<td>3.0</td>
</tr>
<tr>
<td>PWS 288 or STAT 121</td>
<td>3.0</td>
</tr>
<tr>
<td>Total Hours</td>
<td>14.0</td>
</tr>
</tbody>
</table>

#### JUNIOR YEAR

<table>
<thead>
<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>Biological Science</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 352 (GG) or FIN 201 (BB)</td>
<td>3.0</td>
</tr>
<tr>
<td>PWS 288 or STAT 121</td>
<td>3.0</td>
</tr>
<tr>
<td>Total Hours</td>
<td>15.0</td>
</tr>
</tbody>
</table>

#### SENIOR YEAR

<table>
<thead>
<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>Arts or Letters</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 351 (GG) or FIN 201 (BB)</td>
<td>3.0</td>
</tr>
<tr>
<td>PWS 488 (GG) or STRAT 488 (BB)</td>
<td>3.0</td>
</tr>
<tr>
<td>Total Hours</td>
<td>13.0-15.0</td>
</tr>
</tbody>
</table>

#### Note:

The above course of study provides a guide in planning. However, to meet special needs and interests of each student, the courses taken and the order in which they are taken may require alteration. Study the requirements, plan a course of study, and consult with an advisor early in the program. This will save considerable time and minimize frustration.

#### 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.

#### Note:

Preparation for graduate, medical, or dental school should include PHSCS 105-108. Preparation for medical or dental school should include CHEM 351-353.
# BS in Genetics, Genomics & Biotechnology (285823)
## 2021-2022 Program Requirements (62 - 65 Credit Hours)

<table>
<thead>
<tr>
<th>REQUIREMENT 1</th>
<th>Complete 12 courses</th>
</tr>
</thead>
</table>

**CORE COURSES:**
- BIO 165 - Introduction to Bioinformatics 3.0
- CELL 360 - Cell Biology 3.0
- CHEM 105 - General College Chemistry 1 3.0
- CHEM 106 - General College Chemistry 2 3.0
- CHEM 107 - General College Chemistry Laboratory 1.0
- *MMBIO 240 - Molecular Biology 3.0
- PWS 188 - Introduction to Genetics, Genomics, and Biotechnology 1.0
- PWS 288 - Molecular Genetics Laboratory 3.0
- PWS 340 - Genetics 3.0
- PWS 468 - (PWS-Bio-MMBio) Genomics 3.0
- PWS 470 - Analysis of Genetic and Genomic Data 3.0
- *STAT 121 - Principles of Statistics 3.0

**REQUIREMENT 2 Complete 1 course**
- CELL 120 - Science of Biology 3.0
- MMBIO 121 - General Biology: Health and Disease 3.0

**OPTION 3.1 Complete 4 groups**

### A. GENETICS AND GENOMICS CORE TRACK:

- **GROUP 3.1.1 Complete 5 courses**
  - CORE GENETICS AND GENOMICS COURSES:
    - CHEM 351 - Organic Chemistry 1 3.0
    - CHEM 352 - Organic Chemistry 2 3.0
    - CHEM 481 - Biochemistry 3.0
    - PWS 472 - Conservation Genomics 3.0
    - PWS 488 - Readings in Biotechnology 3.0
  - EVOLUTIONARY BIOLOGY COURSE:
    - BIO 250 - Evolutionary Medicine 2.0
    - BIO 420 - Evolutionary Biology 4.0

- **GROUP 3.1.3 Complete 1 course**
  - ORGANISMAL PHYSIOLOGY COURSE:
    - BIO 280 - Comparative Animal Physiology and Anatomy 4.0
    - CELL 362 - Advanced Physiology 3.0
    - MMBIO 461 - Advanced Bacterial Physiology 3.0
    - PWS 440 - Plant Physiological Ecology 3.0

- **GROUP 3.1.4 Complete 6.0 hours from the following course(s)**
  - BIO 220 - Biological Diversity: Animals 4.0
  - BIO 230 - Biological Diversity: Plants 4.0
  - BIO 463 - Genetics of Human Disease 3.0
  - CELL 382 - Developmental Biology 3.0

### OPTION 3.2 Complete 4 groups

**B. BUSINESS MINOR CORE TRACK:**

- **GROUP 3.1.1 Complete 6 courses**
  - ACC 200 - Principles of Accounting 3.0
  - CHEM 285 - Introductory Bio-organic Chemistry 4.0
  - ECON 110 - Economic Principles and Problems 3.0
  - FIN 201 - Principles of Finance 3.0
  - HUM 300 - Organizational Behavior 3.0
  - STRAT 488 - Agribusiness Management 1 3.0

- **GROUP 3.1.2 Complete 1 course**
  - MKTG 201 - Marketing Management 3.0
  - STRAT 489 - Agribusiness Management 2 3.0

- **GROUP 3.2.3 Complete 1 course**
  - ENT 381 - Entrepreneurship Lecture Series 1.0
  - MSB 380 - Executive Lectures 1.0

- **GROUP 3.2.4 Complete 1 selection**
  - SELECTION 3.2.4.1 Complete 1 course
    - PWS 488 - Readings in Biotechnology 3.0
  - SELECTION 3.2.4.2 Complete 2 courses
    - CELL 444 - BIO-Innovation and -Entrepreneurship 1 2.0
    - CELL 445 - BIO-Innovation and -Entrepreneurship 2 2.0

**Note:** To complete a minor from the Marriott School of Business, students must take MKTG 201 in group 3.2.2 and one of the following: Math 110, Math 112, Math 116, Math 118, or IS 201.

### RECOMMENDED Complete 2 options

### RECOMMENDED COURSES

#### FOR PREPROFESSIONAL OR GRADUATE SCHOOL PREPARATION:
- PHSCS 105 - General Physics 1 3.0
- PHSCS 106 - General Physics 2 3.0
- PHSCS 107 - General Physics Lab 1 1.0
- PHSCS 108 - General Physics Lab 2 1.0

#### FOR STUDENTS SEEKING EMPLOYMENT IN THE BIOTECH INDUSTRY:

- MMBIO 151 - Introduction to Microbiology 4.0
- MMBIO 360 - Microbial Genetics 4.0
- PWS 301 - Plant Propagation 3.0
- PWS 399R - Research Internship 9.0v
  - You may take up to 3 credit hours.
- PWS 420 - International Agricultural Development 3.0
- PWS 586 - Plant Cell Biology 3.0
- PWS 588 - Metagenomics 3.0

### PWS 199R - Academic Internship 3.0v

**THE DISCIPLINE:**
This unique degree is for students who desire combined training in wet-lab and computational analysis of genes and genomes. It is a relatively new discipline representing one of the most exciting developments in biological sciences in the 21st century. Students completing this degree will find themselves in the very forefront of biology in the 21st century.

**CAREER OPPORTUNITIES:**
The major is designed to provide a broad range of skills, including the following: quantitative reasoning; interpretation of scientific literature; recognition of historical and current scientific trends; principles of scientific data collection, interpretation, and assimilation; and critical writing. Graduates enter directly into industry, medical schools, or graduate programs in any of the many biological science disciplines.

**HANDS-ON LEARNING OPPORTUNITIES:**
Every student in this major is encouraged to seek mentored research opportunities with faculty in the life sciences. Completing one or more of these mentored research opportunities will set students apart and provide experience and credentials valuable in being admitted into the best graduate programs in the U.S.

**FINANCING:**
Scholarships are available for qualified students from the department, college, and university.

**HONORARY SOCIETIES AND CLUBS:**
The program encourages student participation in the Genetics and Biotechnology Club. Genetics students share a common study area, the Mendel Lab, in room 5114 LSB. Students are also active participants in professional societies, national honor societies, and in other BYU campus academic, service, and social clubs. For more information on the Genetics and Biotechnology Club, contact Dr. Craig Coleman at 801-422-5145.
BS in Genetics, Genomics & Biotechnology (285823)
2021-2022

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 Plant and Wildlife Science
Brigham Young University
4105 Life Sciences Building
Provo, UT 84602
Telephone: (801) 422-2760

ADVISEMENT CENTER INFORMATION
Life Sciences Advisement
Brigham Young University
2060 Life Sciences Building
Provo, UT 84602
Telephone: (801) 422-3042
lifesciences@byu.edu