# 2021 - 2022 Major Map

**Biological Sciences, BS**

School/College: The College of Liberal Arts and Sciences  
Location: Tempe campus

<table>
<thead>
<tr>
<th>LABSCBS</th>
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</table>

## Term 1 0 - 15 Credit Hours

| Critical course signified by | Hours | Minimum Grade | Notes  
| --- | --- | --- | ---  
| BIO 181: General Biology I (SQ) | 4 | C |  
| LIA 101: Student Success in The College of Liberal Arts and Sciences | 1 | |  
| CHM 113: General Chemistry I (SQ) | 4 | C |  
| ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition | 3 | C |  

**Term hours subtotal:** 15

## Term 2 15 - 32 Credit Hours

| Critical course signified by | Hours | Minimum Grade | Notes  
| --- | --- | --- | ---  
| BIO 182: General Biology II (SG) | 4 | C |  
| CHM 116: General Chemistry II (SQ) | 4 | C |  
| ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition | 3 | C |  
| MAT 251: Calculus for Life Sciences (MA) | 3 | |  
| Social-Behavioral Sciences (SB) AND Global Awareness (G) | 3 | |  
| Complete ENG 101 OR ENG 105 OR ENG 107 course(s). | | |  

**Term hours subtotal:** 17

## Term 3 32 - 46 Credit Hours

| Critical course signified by | Hours | Minimum Grade | Notes  
| --- | --- | --- | ---  
| BIO 340: General Genetics | 4 | C |  
| CHM 231: Elementary Organic Chemistry (SQ) | 3 | |  
| CHM 235: Elementary Organic Chemistry Laboratory (SQ) | 1 | |  
| Humanities, Arts and Design (HU) AND Historical Awareness (H) | 3 | |  
| Elective | 3 | |  
| Complete First-Year Composition requirement. | | |  
| Complete Mathematics (MA) requirement. | | |  

**Term hours subtotal:** 14

- LIA 101, ASU 101, or other First-Year Seminar required of all first-year students  
- Students transferring General Statistics (STP 226 or PSY 230) will fulfill STP 231 requirement  
- Select your career interest area and play me3@ASU  
- Join a student organization  
- Create a resume & Handshake account with the Career & Professional Development Center  
- Explore extracurriculars (i.e. service learning, community service, internships, research, student involvement, shadowing, etc.)  
- Attend a Pre-Health 101 session  
- Students transferring Calculus (MAT 270 or MAT 210) will fulfill MAT 251 requirement  
- Pre-health students should take CHM 233 and CHM 237 instead of CHM 231 and CHM 235. See the pre-health website for more information  
- If CHM 233 and 237 are taken, then CHM 234 and 238 must be taken the following semester  
- It is not recommended to take more than two lab courses in a term.  
- Explore extracurriculars (i.e. service learning, community service, internships, research, student involvement, shadowing, etc.)  
- Attend a Study Abroad 101 Session
### Term 4 46 - 61 Credit Hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIO 345: Evolution</strong></td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>Upper Division Additional Major Requirement Course</td>
<td>3-4</td>
<td>C</td>
</tr>
<tr>
<td>Literacy and Critical Inquiry (L)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Cultural Diversity in the U.S. (C)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Term hours subtotal:</strong></td>
<td><strong>15-16</strong></td>
<td></td>
</tr>
</tbody>
</table>

- Explore minors or certificates
- Pre-health students should take CHM 234 and CHM 238 instead of the elective in this term. See the pre-health [website](#) for more information
- If CHM 233 and 237 are taken, then CHM 234 and 238 must be taken the following semester
- Explore extracurriculars (i.e. service learning, community service, internships, research, student involvement, shadowing, etc.)
- Explore or pursue internship opportunities
- Meet with the Career & Professional Development Center to learn how to develop professional skills

### Term 5 61 - 75 Credit Hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major Laboratory/Research Course</strong></td>
<td>1-4</td>
<td>C</td>
</tr>
<tr>
<td><strong>PHY 101: Introduction to Physics (SQ)</strong></td>
<td>4</td>
<td>C</td>
</tr>
<tr>
<td>Upper Division Additional Major Requirement Course</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>Upper Division Elective OR BIO 484: Internship OR MIC 484: Internship</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Term hours subtotal:</strong></td>
<td><strong>14-17</strong></td>
<td></td>
</tr>
</tbody>
</table>

- Pre-health students should take PHY 111 and PHY 113 instead of PHY 101 in this term. See the pre-health [website](#) for more information
- Meet with your advisor to discuss ways to maximize your remaining time at ASU (i.e. pre-health; 4+1 Masters Programs; study abroad)
- Explore graduate school or full-time opportunities

### Term 6 75 - 90 Credit Hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Division Additional Major Requirement Course</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>Upper Division Major Laboratory/Research Course</td>
<td>2-4</td>
<td>C</td>
</tr>
<tr>
<td>Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Complete 2 courses: Elective</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Term hours subtotal:</strong></td>
<td><strong>15-17</strong></td>
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- Pre-health students should take PHY 112 and PHY 114 instead of an elective in this term. See the pre-health [website](#) for more information
- Use Handshake to research employment opportunities
- Explore graduate school or full-time opportunities

### Term 7 90 - 105 Credit Hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Division Major Elective Course</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>Upper Division Additional Major Requirement Course</td>
<td>3-4</td>
<td>C</td>
</tr>
<tr>
<td>Upper Division Science and Society Elective</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>Upper Division Literacy and Critical Inquiry (L)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Upper Division Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Term hours subtotal:</strong></td>
<td><strong>15-16</strong></td>
<td></td>
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- Explore or apply for full-time career opportunities or graduate school
- Meet with your advisor to verify remaining degree requirements have been met prior to Term 8

### Term 8 105 - 120 Credit Hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Division Major Elective Course</td>
<td>3</td>
<td>C</td>
</tr>
</tbody>
</table>
**Major Laboratory/Research Courses**

- BCH 367: Elementary Biochemistry Laboratory
- BIO 308: Plant Physiology
- BIO 321: Introductory Ecology Laboratory
- BIO 341: General Genetics Laboratory
- BIO 343: Genetic Engineering and Society (L) or MBB 343: Genetic Engineering and Society (L)
- BIO 352: Laboratory in Vertebrate Developmental Anatomy
- BIO 354: Cell Biology Laboratory
- BIO 357: Cell and Molecular Biology Laboratory
- BIO 361: Animal Physiology Laboratory
- BIO 370: Vertebrate Zoology
- BIO 385: Comparative Invertebrate Zoology
- BIO 386: General Entomology
- BIO 415: Statistical Models for Biology (CS)
- BIO 435: Research Techniques in Animal Behavior
- BIO 451: Cell Biotechnology; Cell Culture, Immunocytochemistry and Bioimaging
- BIO 471: Ornithology
- BIO 474: Herpetology
- BIO 475: Advanced Human Anatomy
- BIO 484: Internship or MIC 484: Internship
- BIO 495: Undergraduate Research or MBB 495: Undergraduate Research or MBB 495: Undergraduate Research
- MBB 350: Applied Genetics

**Major Elective Courses**

- BIO OR HPS OR MBB OR MIC 3** Elective
- BIO OR HPS OR MBB OR MIC 4** Elective
- BCH 361: Advanced Principles of Biochemistry

**Additional Major Requirements Courses**

- **Ethics, History, and Philosophy of Science**
  - BIO 312: Bioethics (HU) or PHI 320: Bioethics (HU)
  - HPS 314: Philosophy of Science (HU) or PHI 314: Philosophy of Science (HU)

- **Ecology, Conservation Biology and Evolution**
  - BIO 320: Fundamentals of Ecology
  - BIO 421: Landscape Ecology
  - BIO 422: Ecosystem Ecology
  - BIO 423: Population and Community Ecology

- **Microbiology, Molecular, & Cellular Biology**
  - BIO 361: Advanced Principles of Biochemistry
  - BIO 343: Genetic Engineering and Society (L) or MBB 343: Genetic Engineering and Society (L)
  - BIO 351: Developmental Biology
  - BIO 353: Cell Biology
  - BIO 440: Functional Genomics
  - BIO 420: Immunology: Molecular and Cellular Foundations or MIC 420: Immunology: Molecular and Cellular Foundations or MIC 220: Biology of Microorganisms AND MIC 206: Microbiology Laboratory (SG)

- **Organismal Biology**
  - BIO 308: Plant Physiology
  - BIO 331: Animal Behavior

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**Hide Course List(s)/Track Group(s)**

- Upper Division Additional Major Requirement Course
  - 3 C
- Science and Society Elective
  - 3 C
- Complete 2 courses:
  - Elective
  - 6 C

Term hours subtotal: 15

- • All students pursuing a BS or BSP degree in The College of Liberal Arts and Sciences must complete two courses from the Science and Society list found at [https://thecollege.asu.edu/resources/science-society](https://thecollege.asu.edu/resources/science-society). At least one of the two courses must be upper-division and students must earn a C or better in the courses. Both Science and Society courses (i.e., all six credits) may count towards any major, minor, related fields, and ASU General Studies requirements.

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- • Continue to apply for full-time career opportunities or graduate school
MIC 220: Biology of Microorganisms AND MIC 206: Microbiology Laboratory (SG)

MIC 302: Advanced Bacteriology Laboratory (L)

BIO 360: Animal Physiology
BIO 370: Vertebrate Zoology
BIO 461: Comparative Animal Physiology
BIO 462: Endocrine Physiology
BIO 467: Neurobiology

Additional Major Requirements Courses

Ethics, History, and Philosophy of Science

BIO 311: Biology and Society or HPS 340: Biology and Society

BIO 312: Bioethics (HU) or PHI 320: Bioethics (HU)

HPS 314: Philosophy of Science (HU) or PHI 314: Philosophy of Science (HU)

BIO 318: History of Medicine (HU & H) or HPS 331: History of Medicine (HU & H)

BIO 416: Biomedical Research Ethics (L) or HPS 410: Biomedical Research Ethics (L)

Ecology, Conservation Biology and Evolution

BIO 320: Fundamentals of Ecology
BIO 322: Conservation of Biodiversity
BIO 421: Landscape Ecology
BIO 422: Ecosystem Ecology
BIO 423: Population and Community Ecology

Microbiology, Molecular, & Cellular Biology

BCH 361: Advanced Principles of Biochemistry

BIO 343: Genetic Engineering and Society (L) or MBB 343: Genetic Engineering and Society (L)

BIO 351: Developmental Biology
BIO 353: Cell Biology
BIO 440: Functional Genomics
BIO 420: Immunology: Molecular and Cellular Foundations or MIC 420: Immunology: Molecular and Cellular Foundations

MIC 220: Biology of Microorganisms AND MIC 206: Microbiology Laboratory (SG)

Organismal Biology

BIO 308: Plant Physiology
BIO 331: Animal Behavior
Notes:

- First-Year Composition: All students are placed in ENG 101 unless submission of SAT, ACT, Accuplacer, IELTS, or TOEFL score, or college-level transfer credit or test credit equivalent to ASU's first-year composition course(s), determine otherwise. Students on Polytechnic, Downtown Phoenix and West Campuses are encouraged to complete the Directed Self-Placement survey to choose the first-year composition option they believe best suits their needs. Visit: https://cisa.asu.edu/DSP

- Mathematics Placement Assessment score determines placement in first mathematics course.

- Please keep in mind that the applicability of a specific transfer course toward an ASU degree program depends on the requirements of the department, division, college or school in which you are enrolled at ASU. Transfer agreements that guarantee the completion of university level requirements do not necessarily meet college and major requirements. Please consult with an advisor for more information.

General University Requirements Legend

General Studies Core Requirements:

- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

Total Hours: 120
Upper Division Hours: 45 minimum
Major GPA: 2.00 minimum
Cumulative GPA: 2.00 minimum
Total hrs at ASU: 30 minimum
Hrs Resident Credit for Academic Recognition: 56 minimum
Total Community College Hrs: 64 maximum
Total College Residency Hrs: 12 minimum

General Studies Awareness Requirements:

- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

First-Year Composition

General Studies designations listed on the major map are current for the 2021 - 2022 academic year.