# 2019 - 2020 Major Map
**Biological Sciences (Biomedical Sciences), BS**

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

## Term 1  - 15 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
</table>
| LIA 101: Student Success in the College of Liberal Arts and Sciences | 1 |  | • Mathematics Placement Assessment score determines placement in mathematics and science courses  
| BIO 281: Conceptual Approaches to Biology for Majors I (SQ) | 4 | C | • LIA 101, ASU 101, or other First-Year Seminar is required of all freshman students  
| CHM 113: General Chemistry I (SQ) | 4 | C | • An SAT, ACT, Accuplacer, IELTS, or TOEFL score determines placement into first-year composition courses  
| 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 | • Students transferring General Biology I (BIO 181) will fulfill BIO 281 requirement  
| STP 231: Statistics for Life Science (CS) | 3 | C | • Students transferring General Statistics (STP 226 or PSY 230) will fulfill STP 231 requirement  

**Term hours subtotal:** 15

- Mathematics Placement Assessment score determines placement in mathematics and science courses  
- LIA 101, ASU 101, or other First-Year Seminar is required of all freshman students  
- An SAT, ACT, Accuplacer, IELTS, or TOEFL score determines placement into first-year composition courses  
- Students transferring General Biology I (BIO 181) will fulfill BIO 281 requirement  
- Students transferring General Statistics (STP 226 or PSY 230) will fulfill STP 231 requirement  
- Select your major and explore your career interest area and play me3@ASU.

## Term 2  - 32 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
</table>
| BIO 282: Conceptual Approaches to Biology for Majors II | 4 | C | • Create a resume & Handshake account with the Career & Professional Development Center to explore research or internship opportunities  
| CHM 116: General Chemistry II (SQ) | 4 | C | • Attend a Pre-Health 101 Session  
| 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 | • Explore extracurriculars (i.e. service learning, community service, internships, research, student involvement, shadowing, etc.)  
| MAT 251: Calculus for Life Sciences (MA) |  |  | • Join a student organization  
| Social-Behavioral Sciences (SB) AND Global Awareness (G) | 3 |  | • Students transferring General Biology II (BIO 182) will fulfill BIO 282 requirement  
| Complete BIO 281 AND BIO 282 course(s). |  |  | • Students transferring Calculus (MAT 270 or MAT 210) will fulfill MAT 251 requirement |
| Complete ENG 101 OR ENG 105 OR ENG 107 course(s). |  |  | |

**Term hours subtotal:** 17

- Create a resume & Handshake account with the Career & Professional Development Center to explore research or internship opportunities  
- Attend a Pre-Health 101 Session  
- Explore extracurriculars (i.e. service learning, community service, internships, research, student involvement, shadowing, etc.)  
- Join a student organization  
- Students transferring General Biology II (BIO 182) will fulfill BIO 282 requirement  
- Students transferring Calculus (MAT 270 or MAT 210) will fulfill MAT 251 requirement

## Term 3  - 46 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
</table>
| BIO 340: General Genetics OR MBB 347: Molecular Genetics: From Genes to Proteins | 4 | C | • Pre-health students should take CHM 233 and CHM 237 instead of CHM 231 and CHM 235. See pre-health website for more information.  
| CHM 231: Elementary Organic Chemistry (SQ) AND CHM 235: Elementary Organic Chemistry Laboratory (SQ) | 4 | C | • If CHM 233 and 237 are taken, then CHM 234 and 238 must be taken the following semester  
| CLAS Science and Society Elective | 3 | C | • Explore extracurriculars (i.e. service learning, community service, internships, research, student involvement, shadowing, etc.)  
| Humanities, Arts and Design (HU) AND Historical Awareness (H) | 3 |  | |
| Complete First-Year Composition requirement. |  |  | |
| Complete Mathematics (MA) requirement. |  |  | |

**Term hours subtotal:** 14

- Pre-health students should take CHM 233 and CHM 237 instead of CHM 231 and CHM 235. See 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.)
### Term 4 46 - 61 Credit Hours

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 345: Organic Evolution</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Literacy and Critical Inquiry (L)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Cultural Diversity in the U.S. (C)</td>
<td>3</td>
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<td></td>
</tr>
</tbody>
</table>

**Complete 2 courses:**
- Elective

**Term hours subtotal:** 15

- Pre-health students should take CHM 234 and CHM 238 instead of the elective in this term. See 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.)
- Meet with the Career & Professional Development Center to learn how to develop professional skills.

### Term 5 61 - 75 Credit Hours

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCH 361: Advanced Principles of Biochemistry AND BCH 367: Elementary Biochemistry Laboratory</td>
<td>4</td>
<td>C</td>
<td></td>
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<tr>
<td>BIO 353: Cell Biology</td>
<td>3</td>
<td>C</td>
<td></td>
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<tr>
<td>BIO 360: Animal Physiology</td>
<td>3</td>
<td>C</td>
<td></td>
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<tr>
<td>PHY 101: Introduction to Physics (SQ)</td>
<td>4</td>
<td>C</td>
<td></td>
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</table>

**Term hours subtotal:** 14

- Pre-health students should take PHY 111 and PHY 113 instead of PHY 101 in this term. See 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>Course Description</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 351: Developmental Biology OR BIO 420: Immunology: Molecular and Cellular Foundations OR BIO 440: Functional Genomics OR BIO 462: Endocrine Physiology OR BIO 467: Neurobiology</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>BIO 312: Bioethics (HU)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Division Elective</td>
<td>4</td>
<td></td>
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<tr>
<td>Elective</td>
<td>2</td>
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</table>

**Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).**

**Term hours subtotal:** 15

- Pre-health students should take PHY 112 and PHY 114 instead of an elective in this term. See pre-health website for more information.
- BIO 312 may be used to satisfy an upper division Science and Society credit for the College of Liberal Arts and Sciences provided it is not being used to satisfy an HU credit for general studies.
- Some upper division Medicine in Society and Biomedical Research Courses require prerequisites, which may be taken as electives.
- Research employment opportunities or graduate school programs.

### Term 7 90 - 106 Credit Hours

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Division Biomedical Research Course OR Upper Division Medicine in Society Course</td>
<td>4-2</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Upper Division CLAS Science and Society Elective</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Upper Division Literacy and Critical Inquiry (L)</td>
<td>3</td>
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<tr>
<td>Elective OR BIO 484: Internship OR MIC 484: Internship OR MBB 484: Internship</td>
<td>3</td>
<td></td>
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<tr>
<td>Elective</td>
<td>3</td>
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**Term hours subtotal:** 16-14

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### Term 8: 106 - 120 Credit Hours

<table>
<thead>
<tr>
<th>Necessary course signified by 🌟</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 351: Developmental Biology OR BIO 420: Immunology: Molecular and Cellular Foundations OR BIO 440: Functional Genomics OR BIO 462: Endocrine Physiology OR BIO 467: Neurobiology</td>
<td>3</td>
<td>C</td>
<td>- Courses from the Medicine in Society and Biomedical Research groups must include at least one course from each group and at least one lab course. - Some upper division Medicine in Society and Biomedical Research Courses require prerequisites, which may be taken as electives. - 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</td>
</tr>
<tr>
<td>Upper Division Biomedical Research Course OR Upper Division Medicine in Society Course</td>
<td>2-4</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Upper Division Elective</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Complete 2 courses:**

| Elective | 6 |

**Term hours subtotal:** 14-16

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- Some upper division Medicine in Society Courses require lower division prerequisites, which may be taken as electives. See list of Suggested Electives provided.

All students pursuing a B.S. or B.S.P. degree in the College of Liberal Arts and Sciences must complete two courses from the Science and Society list found at [https://clas.asu.edu/advising-and-academic-services/science-and-society](https://clas.asu.edu/advising-and-academic-services/science-and-society). At least one of the two courses must be upper division. Students must earn a C or better in the courses, and no more than one of the two can also be used to simultaneously fill a requirement of the major, minor or related area. Science and Society courses cannot also be used to fill the general studies HU, SB, SQ or SG requirements.
BIO 415: Biometry (CS)
BIO 435: Research Techniques in Animal Behavior
BIO 450: Advanced Developmental Biology
BIO 451: Cell Biotechnology: Cell Culture, Immunocytochemistry and Bioimaging
BMI 465: Introduction to Comparative Genomics
MBB 446: Techniques in Molecular Biology/Genetics Lab or MIC 446: Techniques in Molecular Biology/Genetics Lab
MIC 421: Experimental Immunology
MIC 425: Advanced Immunology
BIO 495: Undergraduate Research or MIC 495: Undergraduate Research or MBB 495: Undergraduate Research
BIO 492: Honors Directed Study or MIC 492: Honors Directed Study or MBB 492: Honors Directed Study

Notes:

- 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.

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 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)

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 2019 - 2020 academic year.