








## 2022 - 2023 Major Map

### Biological Sciences (Genetics, Cell and Developmental Biology), BS

School/College: [The College of Liberal Arts and Sciences](#)  
LABSCGBS



In order to complete the requirements of this program, some laboratory courses will be completed in-person at the Tempe Campus.




These laboratory courses will be offered during summer. This may impact your financial aid. Financial aid is available to those who apply and qualify, and students may receive funds to help cover costs for each semester of enrollment. The amount of financial aid that a student is eligible for varies depending on prior education experience and other individual factors. [Learn](#) more about summer financial aid and additional ways to cover summer costs.



Term 1 - A 0 - 8 Credit Hours <b>Critical course signified by</b> 	Hours	Minimum Grade	Notes
 ASU 101-LA: The ASU Experience	1		<ul style="list-style-type: none"> <li>ASU 101 or college-specific equivalent First-Year Seminar required of all first-year students</li> </ul>
 BIO 181: General Biology I (SQ)	4	C	
ENG 101 or ENG 102: First-Year Composition OR			
ENG 105: Advanced First-Year Composition OR	3	C	
ENG 107 or ENG 108: First-Year Composition			
Term hours subtotal:	8		
Term 1 - B 8 - 15 Credit Hours <b>Critical course signified by</b> 	Hours	Minimum Grade	Notes
 BIO 182: General Biology II (SG)	4	C	<ul style="list-style-type: none"> <li>View ASU Online first-year student registration information <a href="#">here</a>.</li> <li>Create a resume and <a href="#">Handshake account</a> with the Career &amp; Professional Development Center to explore research or internship opportunities</li> <li>Explore extracurriculars (i.e. service learning, community service, internships, research, student involvement, shadowing, etc.)</li> <li>Join a <a href="#">student organization</a></li> </ul>
ENG 101 or ENG 102: First-Year Composition OR			
ENG 105: Advanced First-Year Composition OR	3	C	
ENG 107 or ENG 108: First-Year Composition			
Term hours subtotal:	7		
Term 2 - A 15 - 22 Credit Hours	Hours	Minimum Grade	Notes
CHM 113: General Chemistry I (SQ)	4	C	<ul style="list-style-type: none"> <li>Select your <a href="#">career interest area</a> and play <a href="#">me3@ASU</a>.</li> <li>Students transferring Calculus (MAT 270 or MAT 210) will fulfill MAT 251 requirement</li> </ul>
MAT 251: Calculus for Life Sciences (MA)	3	C	
Term hours subtotal:	7		
Term 2 - B 22 - 29 Credit Hours <b>Critical course signified by</b> 	Hours	Minimum Grade	Notes
CHM 116: General Chemistry II (SQ)	4	C	<ul style="list-style-type: none"> <li>If interested in health-related professional programs, research the <a href="#">timeline</a> for admissions preparation and <a href="#">general admission requirements</a>.</li> <li>Explore extracurriculars (i.e. service learning, community service, internships,</li> </ul>
STP 231: Statistics for Life Science (CS)	3	C	
 Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
Term hours subtotal:	7		

research, student involvement, shadowing, etc.)

- Students transferring General Statistics (STP 226 or PSY 230) will fulfill STP 231 requirement

Term 3 - A 29 - 36 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 BIO 340: General Genetics	4	C	<ul style="list-style-type: none"> <li>• Due to lower-division prerequisites, pre-health students are encouraged to choose upper division General Studies (HU or SB) and The College Science and Society courses.</li> <li>• It is not recommended to take more than two lab courses in a term.</li> <li>• Review the <a href="#">Career Guide for ASU Online students</a> to learn about available career planning resources.</li> </ul>
Humanities, Arts and Design (HU)	3		
Term hours subtotal:	7		

Term 3 - B 36 - 42 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
Humanities, Arts and Design (HU) AND Historical Awareness (H)	3		<ul style="list-style-type: none"> <li>• Meet with the <a href="#">Career &amp; Professional Development Center</a> to learn how to develop professional skills</li> </ul>
Literacy and Critical Inquiry (L)	3		
 Complete First-Year Composition requirement.			
 Complete Mathematics (MA) requirement.			
Term hours subtotal:	6		

Term 4 - A 42 - 48 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 BIO 345: Evolution	3	C	<ul style="list-style-type: none"> <li>• Develop your <a href="#">professional online presence</a></li> </ul>
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		
Term hours subtotal:	6		

Term 4 - B 48 - 54 Credit Hours	Hours	Minimum Grade	Notes
CHM 231: Elementary Organic Chemistry (SQ)	3	C	<ul style="list-style-type: none"> <li>• Pre-health students should take CHM 233 and CHM 237 instead of CHM 231 and CHM 235. See the <a href="#">pre-health website</a> for more information</li> <li>• If CHM 233 is taken, then CHM 234 must be taken the following semester</li> <li>• Organic Chemistry labs (CHM 237 for CHM 233, and CHM 238 for CHM 234) are required and available at ASU over the summer. Please speak with an advisor for more information.</li> </ul>
Social-Behavioral Sciences (SB) AND Cultural Diversity in the U.S. (C)	3		
Term hours subtotal:	6		

Summer 4 54 - 55 Credit Hours	Hours	Minimum Grade	Notes
CHM 235: Elementary Organic Chemistry Laboratory (SQ)	1	C	<ul style="list-style-type: none"> <li>• ASU Online students will complete all experiments for the CHM 235 organic chemistry lab at the ASU Tempe Campus during a one-week session in summer. Lab reports will be completed in later weeks during the same summer term.</li> </ul>
Term hours subtotal:	1		

- Pre-health students will complete CHM 237 and CHM 238 organic chemistry labs instead of CHM 235.

Term 5 - A 55 - 62 Credit Hours <b>Necessary course signified by</b> ★	Hours	Minimum Grade	Notes
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★ BIO 351: Developmental Biology OR BIO 353: Cell Biology OR BCH 361: Advanced Principles of Biochemistry	3	C	<ul style="list-style-type: none"> <li>• Due to lower-division prerequisites, pre-health students are encouraged to choose upper-division General Studies (HU or SB) and The College Science and Society courses.</li> <li>• If interested in health-related professional programs, use <a href="#">ASU's Health Professions Advising</a> to prepare for application.</li> <li>• Pre-health students should take PHY 111 and PHY 113 instead of PHY 101 in this term. See the pre-health <a href="#">website</a> for more information</li> <li>• Meet with your advisor to discuss ways to maximize your remaining time at ASU (i.e. pre-health; 4+1 Masters Programs; study abroad)</li> <li>• Explore graduate school or full-time <a href="#">career opportunities</a>.</li> </ul>
PHY 101: Introduction to Physics (SQ)	4	C	
Term hours subtotal:	7		

Term 5 - B 62 - 68 Credit Hours	Hours	Minimum Grade	Notes
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BIO 360: Animal Physiology OR MBB 440: Functional Genomics or BIO 440: Functional Genomics OR MIC 420: Immunology: Molecular and Cellular Foundations or BIO 420: Immunology: Molecular and Cellular Foundations	3	C	<ul style="list-style-type: none"> <li>• <a href="#">Network</a> in your career interest area.</li> </ul>
Science and Society Elective	3	C	
Term hours subtotal:	6		

Term 6 - A 68 - 74 Credit Hours <b>Necessary course signified by</b> ★	Hours	Minimum Grade	Notes
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★ BIO 351: Developmental Biology OR BIO 353: Cell Biology OR BCH 361: Advanced Principles of Biochemistry	3	C	<ul style="list-style-type: none"> <li>• Work with your academic advisor to align your additional major requirements and major elective courses with your career aspirations</li> <li>• Use <a href="#">Handshake</a> to research employment opportunities</li> </ul>
Upper Division Science and Society Elective	3	C	
Term hours subtotal:	6		

Term 6 - B 74 - 80 Credit Hours <b>Necessary course signified by</b> ★	Hours	Minimum Grade	Notes
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BIO 360: Animal Physiology OR MBB 440: Functional Genomics or BIO 440: Functional Genomics OR MIC 420: Immunology: Molecular and Cellular Foundations or BIO 420: Immunology: Molecular and Cellular Foundations	3	C	
Upper Division Literacy and Critical Inquiry (L)	3		
★ Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).			
Term hours subtotal:	6		

Term 7 - A 80 - 86 Credit Hours <b>Necessary course signified by</b> ★	Hours	Minimum Grade	Notes
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★ BIO 351: Developmental Biology OR BIO 353: Cell Biology OR BCH 361: Advanced Principles of Biochemistry	3	C	
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Upper Division Humanities, Arts and Design (HU) OR Upper  
Division Social-Behavioral Sciences (SB)

3

Term hours subtotal: 6

- Meet with your advisor to verify remaining degree requirements have been met prior to Term 8
- **Explore** or apply for full-time career opportunities or graduate school

Term 7 - B 86 - 92 Credit Hours	Hours	Minimum Grade	Notes
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Complete 2 courses:

Elective

6

Term hours subtotal: 6

- Pre-health students should take PHY 112 and PHY 114 instead of an elective this term. See the pre-health [website](#) for more information

Term 8 - A 92 - 97 Credit Hours <b>Necessary course signified by</b> 	Hours	Minimum Grade	Notes
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Complete 2 courses:

Upper Division Major Elective

5

C

Term hours subtotal: 5

- Explore other resources available through ASU's [Career and Professional Development Center](#)

Term 8 - B 97 - 104 Credit Hours	Hours	Minimum Grade	Notes
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Complete 2 courses:

Upper Division Elective

7

Term hours subtotal: 7

- Gather [professional references](#)

Term 9 - A 104 - 109 Credit Hours	Hours	Minimum Grade	Notes
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Complete 2 courses:

Elective

5

Term hours subtotal: 5

Term 9 - B 109 - 116 Credit Hours <b>Necessary course signified by</b> 	Hours	Minimum Grade	Notes
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 Major Laboratory/Research Course

1

C

Complete 2 courses:

Elective

6

Term hours subtotal: 7

- Continue to apply for [full-time career](#) opportunities or [graduate school](#)

Term 10 - A 116 - 120 Credit Hours <b>Necessary course signified by</b> 	Hours	Minimum Grade	Notes
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 Upper Division Major Laboratory/Research Course

2-4

C

Elective

2

Term hours subtotal: 4-6

- 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>. 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.

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

Major Laboratory/Research Courses

Major Electives

BCH 367: Elementary Biochemistry Laboratory	BCH 367: Elementary Biochemistry Laboratory
BIO 342: General Genetics Laboratory	BIO OR HPS OR MBB OR MIC 3** Elective
BIO 357: Cell and Molecular Biology Laboratory	BIO OR HPS OR MBB OR MIC 4** Elective
BIO 361: Animal Physiology Laboratory	
BIO 475: Advanced Human Anatomy	
BIO 492: Honors Directed Study or MIC 492: Honors Directed Study or MBB 492: Honors Directed Study	
BIO 495: Undergraduate Research or MBB 495: Undergraduate Research or MIC 495: Undergraduate Research	
MIC 206: Microbiology Laboratory (SG) AND MIC 220: Biology of Microorganisms	

#### 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.

**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 next to courses on the major map were valid for the 2022 - 2023 academic year. Please refer to the course catalog for current General Studies designations at time of class registration. General Studies credit is applied according to the designation the course carries at the time the class is taken.