












2022 - 2023 Major Map

Molecular Biosciences and Biotechnology, BS

School/College: The College of Liberal Arts and Sciences
LAMBBBS

Term 1 0 - 15 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 BIO 181: General Biology I (SQ)	4	C	<ul style="list-style-type: none"> LIA 101, ASU 101, or college-specific 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 Communities and play me3@ASU.
 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	3	C	
ENG 107 or ENG 108: First-Year Composition			
STP 231: Statistics for Life Science (CS)	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	<ul style="list-style-type: none"> Join a student organization. Activate your Handshake account and build out your profile. 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.
CHM 116: General Chemistry II (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			
MAT 251: Calculus for Life Sciences (MA)	3	C	
Elective	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
 MBB 347: Molecular Genetics: From Genes to Proteins	4	C	<ul style="list-style-type: none"> Pre-health students should take CHM 233 and CHM 237 instead of CHM 231 and CHM 235 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 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 Explore minors or certificates
CHM 231: Elementary Organic Chemistry (SQ) AND CHM 235: Elementary Organic Chemistry Laboratory (SQ)	4	C	
Science and Society Elective	3	C	
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		
 Complete First-Year Composition requirement.			
 Complete Mathematics (MA) requirement.			
Term hours subtotal:	14		
Term 4 46 - 60 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes

❗ MBB 343: Genetic Engineering and Society (L)	4	C
❗ MIC 220: Biology of Microorganisms AND MIC 206: Microbiology Laboratory (SG)	4	C
Humanities, Arts and Design (HU) AND Historical Awareness (H)	3	
Elective	3	
Term hours subtotal:	14	

- Pre-health students should take CHM 234 and CHM 238 instead of an elective 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
- MBB 343 will be used to satisfy the upper-division Science and Society requirement for The College.
- 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 60 - 76 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MBB 484: Internship OR MBB 492: Honors Directed Study OR MBB 495: Undergraduate Research	3	C	
PHY 101: Introduction to Physics (SQ)	4	C	
Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)	3		
Social-Behavioral Sciences (SB)	3		
Elective	3		
Term hours subtotal:	16		

- Pre-health students should take PHY 111 and PHY 113 instead of PHY 101. See pre-health [website](#) for more information.
- MBB 484 or MBB 492 or MBB 495 requires the completion of an individualized instruction form and meeting with a faculty member before the semester begins. These are positions and research experience secured by the student on their own.
- Meet with your [advisor](#) to discuss ways to maximize your remaining time at ASU (i.e. pre-health; 4+1 Masters Programs; study abroad).
- Thinking about graduate school? Consider registering for a grad school [test prep course](#).

Term 6 76 - 90 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MBB 484: Internship OR MBB 492: Honors Directed Study OR MBB 495: Undergraduate Research	3	C	
BCH 361: Advanced Principles of Biochemistry AND BCH 367: Elementary Biochemistry Laboratory	4	C	
Upper Division Elective	3		
Elective	4		
★ Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).			
Term hours subtotal:	14		

- Pre-health students should take PHY 112 and PHY 114 instead of an elective this term. See pre-health [website](#) for more information.
- MBB 484 or MBB 492 or MBB 495 requires the completion of an individualized instruction form and meeting with a faculty member before the semester begins. These are positions and research experience secured by the student on their own.
- Use Handshake to research [employment opportunities](#).

Term 7 90 - 105 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MBB 490: Capstone: Issues in Biotechnology (L)	2	C	
Upper Division Major Electives	3	C	
Upper Division Social-Behavioral Sciences (SB) OR Upper Division Humanities, Arts and Design (HU)	3		

- MBB 490 is a fall only course and can be taken before or after MBB 491 in a student's final year.

Complete 2 courses:	7
Upper Division Elective	
Term hours subtotal:	15

- **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 Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MBB 491: Capstone: Issues in Molecular Biosciences (L)	2	C	
Upper Division Major Electives	4	C	
Upper Division Elective	3		
Complete 2 courses:	6		
Elective			
Term hours subtotal:	15		

- MBB 491 is a spring only course and can be taken before or after MBB 490 in a student's final year.
- Continue to **apply** for full-time career opportunities or graduate school.

- 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 Electives
BIO 308: Plant Physiology
BIO 355: Introduction to Computational Molecular Biology (CS) or MAT 355: Introduction to Computational Molecular Biology (CS) or MBB 355: Introduction to Computational Molecular Biology (CS)
BIO 357: Cell and Molecular Biology Laboratory
BIO 415: Statistical Models for Biology (CS)
BIO 439: Computing for Research
BIO 451: Cell Biotechnology: Cell Culture, Immunocytochemistry and Bioimaging
BIO 494: Biotechnology Viruses as Tools
MBB 350: Applied Genetics
MBB 440: Functional Genomics or BIO 440: Functional Genomics
MBB 445: Techniques in Molecular Biology/Genetics AND MBB 446: Techniques in Molecular Biology/Genetics Lab or MIC 445: Techniques in Molecular Biology/Genetics AND MIC 446: Techniques in Molecular Biology/Genetics Lab
MIC 302: Advanced Bacteriology Laboratory (L)
MIC 420: Immunology: Molecular and Cellular Foundations or BIO 420:

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.