

2023 - 2024 Major Map

Biological Sciences (Biomedical Sciences), BS

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

| 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 other First-Year Seminar is 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. |
|  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 | |
| 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"> • Create a resume and 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 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 ENG 107 or ENG 108: First-Year Composition | 3 | C | |
| MAT 251: Calculus for Life Sciences (MA) | 3 | C | |
| 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 OR 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. 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. • On-campus students are encouraged to take MBB 347 to satisfy the genetics requirement. • Explore extracurriculars (i.e. service learning, community service, internships, research, student involvement, shadowing, etc.) |
| CHM 231: Elementary Organic Chemistry (SQ) | 3 | C | |
| CHM 235: Elementary Organic Chemistry Laboratory (SQ) | 1 | C | |
| Science and Society Elective | 3 | C | |
| Humanities, Arts and Design (HU) AND Historical Awareness (H) | 3 | | |
|  Complete First-Year Composition requirement. | | | |
|  Complete Mathematics (MA) requirement. | | | |
| Term hours subtotal: | 14 | | |

- Attend a [Study Abroad 101 Session](#)
- Explore [minors or certificates](#)

| Term 4 46 - 61 Credit Hours Critical course signified by  | Hours | Minimum Grade | Notes |
|---|-------|---------------|---|
|  BIO 345: Evolution | 3 | C | <ul style="list-style-type: none"> • 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. |
| Literacy and Critical Inquiry (L) | 3 | | |
| Social-Behavioral Sciences (SB) AND Cultural Diversity in the U.S. (C) | 3 | | |
| Complete 2 courses: | | | |
| Elective | 6 | | |
| Term hours subtotal: | 15 | | |

| Term 5 61 - 75 Credit Hours Necessary course signified by  | Hours | Minimum Grade | Notes |
|--|-------|---------------|--|
|  BCH 361: Advanced Principles of Biochemistry | 3 | C | <ul style="list-style-type: none"> • 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) |
|  BCH 367: Elementary Biochemistry Laboratory | 1 | C | |
|  BIO 353: Cell Biology | 3 | C | |
| PHY 101: Introduction to Physics (SQ) | 4 | C | |
| Humanities, Arts and Design (HU) | 3 | | |
| Term hours subtotal: | 14 | | |

| Term 6 75 - 90 Credit Hours Necessary course signified by  | Hours | Minimum Grade | Notes |
|--|-------|---------------|---|
| 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 | 3 | C | <ul style="list-style-type: none"> • 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 or BIO 416 will be used to satisfy the upper-division Science and Society credit for The College • 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 |
|  BIO 360: Animal Physiology | 3 | C | |
| BIO 312: Bioethics (HU) OR BIO 416: Biomedical Research Ethics (L) | 3 | C | |
| Upper Division Elective | 4 | | |
| Elective | 2 | | |
|  Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s). | | | |
| Term hours subtotal: | 15 | | |

| Term 7 90 - 106 Credit Hours Necessary course signified by  | Hours | Minimum Grade | Notes |
|--|-------|---------------|--|
|  Upper Division Biomedical Research Course OR Upper Division Medicine in Society Course | 4-2 | C | <ul style="list-style-type: none"> • 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 |
| Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB) | 3 | | |
| Upper Division Literacy and Critical Inquiry (L) | 3 | | |
| Upper Division Elective | 3 | | |
| Elective | 3 | | |
| Term hours subtotal: | 16-14 | | |

- Meet with your **advisor** to verify remaining degree requirements have been met prior to Term 8

| Term 8 106 - 120 Credit Hours Necessary course signified by ★ | Hours | Minimum Grade | Notes |
|---|-------|---------------|--|
| ★ 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 | 3 | C | <ul style="list-style-type: none"> • 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. • Continue to apply for full-time career opportunities or graduate school |
| ★ Upper Division Biomedical Research Course OR Upper Division Medicine in Society Course | 2-4 | C | |
| Complete 3 courses: Elective | 9 | | |
| Term hours subtotal: | | 14-16 | |

- Students must take at least one course from the Medicine in Society group and at least one course from the Biomedical Research group, and at least one of those must be a lab course.
- 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 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)

| Biomedical Research | Medicine in Society | Suggested Electives |
|---|--|--|
| BIO 342: General Genetics Laboratory | ASB 301: Global History of Health (SB & G & H) or HST 301: Global History of Health (SB & G & H) or SSH 301: Global History of Health (SB & G & H) | ASB 100: Introduction to Global Health (SB & G) |
| BIO 343: Genetic Engineering and Society (L) or MBB 343: Genetic Engineering and Society (L) | ASB 443: Cross-Cultural Studies in Global Health ((L or SB) & G) or SSH 403: Cross-Cultural Studies in Global Health ((L or SB) & G) | ASB 102: Introduction to Cultural Anthropology (SB & G) |
| BIO 352: Laboratory in Vertebrate Developmental Anatomy | ASB 452: Community Partnerships for Global Health (SB) or SSH 402: Community Partnerships for Global Health (SB) | ASB 222: Buried Cities and Lost Tribes ((HU or SB) & G & H) |
| BIO 354: Cell Biology Laboratory | ASB 462: Medical Anthropology: Culture and Health (SB & C) | ASB 223: Aztecs, Incas and Mayas ((HU or SB) & G & H) |
| 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) | ASM 345: Disease and Human Evolution | ASM 104: Bones, Stones, and Human Evolution (SB or SG) |
| BIO 357: Cell and Molecular Biology Laboratory | ASM 401: Health and Human Biology | BIO 331: Animal Behavior |
| BIO 361: Animal Physiology Laboratory | ASM 403: Evolutionary Medicine and Global Health or BIO 403: Evolutionary Medicine and Global Health | HST 101: Global History Since 1500 (HU & H & G) or SGS 111: Global History Since 1500 (HU & H & G) |
| BIO 370: Vertebrate Zoology | ASM 414: Urban, Environmental and Health Challenges (SB) | MBB 445: Techniques in Molecular Biology/Genetics or MIC 445: Techniques in Molecular Biology/Genetics |
| BIO 390: Medical/Dental Field Placement or BIO 484: Internship or MIC 484: Internship | BIO 302: Cancer--Mother of All Diseases (L) | |
| BIO 415: Statistical Models for Biology (CS) | | |

| | |
|--|--|
| BIO 435: Research Techniques in Animal Behavior | BIO 311: Biology and Society or HPS 340: Biology and Society |
| BIO 439: Computing for Research | BIO 394: Healing Traditions of Latino-America |
| BIO 450: Advanced Developmental Biology | BIO 394: Spanish for Biomedical Sciences |
| BIO 451: Cell Biotechnology: Cell Culture, Immunocytochemistry and Bioimaging | BIO 408: Advanced Evolutionary Medicine |
| BIO 475: Advanced Human Anatomy | BIO 494: Introduction To Clinical Healthcare |
| BIO 492: Honors Directed Study or MBB 492: Honors Directed Study or MIC 492: Honors Directed Study | HPS 331: History of Medicine (HU & H) or BIO 318: History of Medicine (HU & H) |
| BIO 495: Undergraduate Research or MBB 495: Undergraduate Research or MIC 495: Undergraduate Research | MIC 314: HIV/AIDS: Science, Behavior, and Society or SSH 314: HIV/AIDS: Science, Behavior, and Society |
| 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 | |

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 2023 - 2024 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.