

**College of Science**  
Department of Biological Sciences  
For students entering under UG Catalog 2023-2024  
Bachelor of Science in Biological Sciences  
Major: Biological Sciences

**Pathways General Education Requirements (45 credits)**

**Concept 1: Discourse (9 credits)**

1f – Foundational (6 credits)

ENGL 1105 First-Year Writing (3)

ENGL 1106 First-Year Writing (3)

1a – Advanced/Applied (3 credits) \_\_\_\_\_ (3)

**Concept 2: Critical Thinking in the Humanities (6 credits)**

\_\_\_\_\_ (3)

\_\_\_\_\_ (3)

**Concept 3: Reasoning in the Social Sciences (6 credits)**

\_\_\_\_\_ (3)

\_\_\_\_\_ (3)

**Concept 4: Reasoning in the Natural Sciences (6 credits)**

BIOL 1105 Principles of Biology<sup>1\*</sup> (3)

BIOL 1106 Principles of Biology<sup>1\*</sup> (3)

**Concept 5: Quantitative and Computational Thinking (9 credits)**

1f – Foundational (6 credits)

MATH 1025 Elementary Calculus\* (3)

MATH 1026 Elementary Calculus\* (3)

1a – Advanced/Applied (3 credits)

STAT 3615 Biological Statistics<sup>#</sup> (3)

**Concept 6: Critique and Practice in Design and the Arts (6 credits = 3 design + 3 arts, or 6 integrated design/arts)**

\_\_\_\_\_ (3) Arts

\_\_\_\_\_ (3) Design

**Concept 7: Critical Analysis of Identity and Equity in the United States (3 credits)**

\_\_\_\_\_ (3)

### **BIOL Degree Core Requirements (20 credits)**

BIOL 1115 Principles of Biology Lab <sup>1*</sup> (1)	BIOL 2704 Evolutionary Biology <sup>#</sup> (3)
BIOL 1116 Principles of Biology Lab <sup>1*</sup> (1)	BIOL 2804 Ecology <sup>#</sup> (3)
BIOL 2004 Genetics <sup>#</sup> (3)	CHEM 1035 General Chemistry <sup>1*</sup> (3)
BIOL 2134 Cell Function and Differentiation <sup>#</sup> (3)	CHEM 1036 General Chemistry <sup>1*</sup> (3)

### **Biological Sciences Major Requirements<sup>#</sup> (19 credits)**

BIOL 1004 Biology Orientation Seminar <sup>2*</sup> (1)	CHEM 2546 Organic Chemistry Lab <sup>**</sup> (1)
CHEM 1045 General Chemistry Lab <sup>*</sup> (1)	PHYS 2205 General Physics <sup>**</sup> (3)
CHEM 1046 General Chemistry Lab <sup>*</sup> (1)	PHYS 2206 General Physics <sup>**</sup> (3)
CHEM 2535 Organic Chemistry <sup>**</sup> (3)	PHYS 2215 General Physics Lab <sup>**</sup> (1)
CHEM 2536 Organic Chemistry <sup>**</sup> (3)	PHYS 2216 General Physics Lab <sup>**</sup> (1)
CHEM 2545 Organic Chemistry Lab <sup>**</sup> (1)	

### **Biological Sciences Electives (22 credits)**

Complete 22 credits of Biological Sciences electives, including:

a. **at least one** of BIOL 2304, BIOL 2504, or BIOL 2604

BIOL 2304 Plant Biology <sup>#</sup> (3)	BIOL 2604 General Microbiology <sup>#</sup> (3)
BIOL 2504 General Zoology <sup>#</sup> (3)	

b. **at least three** linked or inclusive laboratory courses from the list below (two must be BIOL or cross listed courses).  
Note: courses used to complete this requirement also count as Biological Sciences elective credits (section c).

#### **Linked Lab Courses<sup>#</sup>**

BIOL 2604 General Microbiology<sup>#</sup> (3) + BIOL 2614 General Microbiology Lab<sup>#</sup> (1-2)  
BIOL 3014 Insect Biology<sup>#</sup> (2) + BIOL 3024 Insect Biology Laboratory<sup>#</sup> (2)  
BIOL 3254 Med & Vet Entomology<sup>#</sup> (3) + BIOL 3264 Med & Vet Entomology Lab<sup>#</sup> (1)  
BIOL 4624 Microbial Genetics<sup>#</sup> (3) + BIOL 4644 Microbial Genetics & Physiology Lab<sup>#</sup> (3)  
BIOL 4674 Pathogenic Bacteriology<sup>#</sup> (3) + BIOL 4724 Pathogenic Bacteriology Lab<sup>#</sup> (2)  
BIOL 4704 Immunology<sup>#</sup> (3) + BIOL 4714 Immunology Laboratory<sup>#</sup> (1)  
CSES 3114 Soils<sup>#</sup> (3) + CSES 3124 Soils Lab<sup>#</sup> (1)  
NEUR 2025 Introduction to Neuroscience<sup>#</sup> (3) + NEUR 2035 Neuroscience Lab<sup>#</sup> (1)  
PSYC 4064 Physiological Psychology<sup>#</sup> (3) + PSYC 4264 Laboratory in Phys Psc<sup>#</sup> (1)

#### **Inclusive Lab Courses<sup>#</sup>**

BIOL 1135 Phage Hunters (2)	BIOL 4314 Plant Ecology <sup>#</sup> (4)
BIOL 1136 Phage Hunters <sup>#</sup> (2)	BIOL 4354 Aquatic Entomology <sup>#</sup> (4)
BIOL 3104 Cell Molecular Biol Laboratory <sup>#</sup> (1)	BIOL 4404 Ornithology <sup>#</sup> (4)
BIOL 3114 Field and Laboratory Ecology <sup>#</sup> (1)	BIOL 4454 Invertebrate Zoology <sup>#</sup> (4)
BIOL 3204 Plant Taxonomy <sup>#</sup> (3)	BIOL 4484 Freshwater Biomonitoring <sup>#</sup> (4)
BIOL 3454 Introductory Parasitology <sup>#</sup> (4)	BIOL 4824 Bioinformatics Methods <sup>#</sup> (3)
BIOL 3514 Introduction to Histology <sup>#</sup> (3)	FIW 4334 Mammalogy <sup>#</sup> (4)
BIOL 3604 Food Microbiology <sup>#</sup> (4)	FIW 4344 Herpetology <sup>#</sup> (4)
BIOL 4004 Freshwater Ecology <sup>#</sup> (4)	FIW 4424 Ichthyology <sup>#^</sup> (4)
BIOL 4164 Environmental Microbiology <sup>#</sup> (3)	PPWS 4104 Plant Pathology <sup>#</sup> (4)

c. **at least 12 credits at the 3000 or 4000 level** from the following list of Biological Sciences elective credits. A maximum of 9 credits of non-BIOL or non-cross listed courses from the list below may be counted toward the 22 required Biological Sciences elective credits.

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|---|--|
| BIOL 1024 Cancer Causes Treatments Costs (3)  | BIOL 4164 Environmental Microbiology# (3)                        |
| BIOL 1034 Biology of Sex (3)                  | BIOL 4314 Plant Ecology# (4)                                     |
| BIOL 1054 Human Biol: Cncpts Curr Issues (3)  | BIOL 4334 Chemical Ecology# (3)                                  |
| BIOL 1064 Plants and Civilization (3)         | BIOL 4354 Aquatic Entomology# (4)                                |
| BIOL 1074 How Animals Think (3)               | BIOL 4404 Ornithology# (4)                                       |
| BIOL 1135 Phage Hunters (2)                   | BIOL 4454 Invertebrate Zoology# (4)                              |
| BIOL 1136 Phage Hunters# (2)                  | BIOL 4474 Ethology*# (3)   |
| BIOL 2304 Plant Biology# (3)                  | BIOL 4484 Freshwater Biomonitoring# (4)                          |
| BIOL 2404 Biotech in Global Soc# (3)          | BIOL 4554 Neurochemical Regulation# (3)                          |
| BIOL 2504 General Zoology# (3)                | BIOL 4564 Infectious Disease Ecology# (3)                        |
| BIOL 2604 General Microbiology*# (3)          | BIOL 4574 Social Behav Birds & Mammals# (3)                      |
| BIOL 2614 General Microbiology Lab# (1-2)     | BIOL 4594 EEB Senior Seminar# (3)                                |
| BIOL 3014 Insect Biology# (2)                 | BIOL 4624 Microbial Genetics# (3)                                |
| BIOL 3024 Insect Biology Laboratory# (2)      | BIOL 4634 Microbial Physiology# (3)                              |
| BIOL 3104 Cell Molecular Biol Laboratory# (1) | BIOL 4644 Microbial Genetics & Physiol Lab# (3)                  |
| BIOL 3114 Field and Laboratory Ecology# (1)   | BIOL 4664 Virology# (3)  |
| BIOL 3134 Human Genetics# (3)                 | BIOL 4674 Pathogenic Bacteriology# (3)                           |
| BIOL 3204 Plant Taxonomy# (3)                 | BIOL 4684 Microbiomes# (3)                                       |
| BIOL 3254 Med and Vet Entomology# (3)         | BIOL 4704 Immunology# (3)  |
| BIOL 3264 Med and Vet Entomology Lab# (1)     | BIOL 4714 Immunology Laboratory# (1)                             |
| BIOL 3404 Introductory Animal Physiology# (3) | BIOL 4724 Pathogenic Bacteriology Lab# (2)                       |
| BIOL 3454 Introductory Parasitology# (4)      | BIOL 4734 Inflammation Biology# (3)                              |
| BIOL 3514 Introduction to Histology# (3)      | BIOL 4804 Prokaryotic Diversity# (3)                             |
| BIOL 3604 Food Microbiology# (4)              | BIOL 4824 Bioinformatics Methods# (3)                            |
| BIOL 3774 Molecular Biology# (3)              | BIOL 4844 Proteomics Mass Spectrometry# (3)                      |
| BIOL 3954 Study Abroad (var. credit) ( )      | BIOL 4854 Cytogenetics# (3)                                      |
| BIOL 4004 Freshwater Ecology# (4)             | BIOL 4864 Clinical Biology# (3)                                  |
| BIOL 4014 Environmental Toxicology# (2)       | BIOL 4874 Cancer Biology# (3)                                    |
| BIOL 4104 Developmental Biology# (3)          | BIOL 4884 Cell Biology# (3)                                      |
| BIOL 4114 Global Change Ecology# (3)          | BIOL 4974 Independent Study (var. credit) <sup>3</sup>           |
| BIOL 4134 Evolutionary Genetics# (3)          | BIOL 4994 Undergraduate Research (var. credit) <sup>3*</sup> ( ) |
| ALS 2304 Animal Physiology and Anatomy# (4)   | FIW 4624 Marine Ecology# (3)                                     |
| ALS 3104 Animal Breeding & Genetics# (3)      | FST 4634 Epidemiology Foodborne Disease# (3)                     |
| ALS 3204 Animal Nutrition & Feeding# (3)      | NEUR 2025 Introduction to Neuroscience# (3)                      |
| BCHM 3114 Biochem for Biotech# (3)            | NEUR 2026 Introduction to Neuroscience# (3)                      |
| CSES 3114 Soils# (3)                          | NEUR 2035 Neuroscience Lab# (1)                                  |
| CSES 3124 Soils Laboratory# (1)               | NEUR 2036 Neuroscience Lab# (1)                                  |
| FIW 2314 Wildlife Biology#^ (3)               | PPWS 4104 Plant Pathology# (4)                                   |
| FIW 4334 Mammalogy# (4)                       | PPWS 4114 Microbial Forensics / Biosecurity# (3)                 |
| FIW 4344 Herpetology# (4)                     | PSYC 2064 Intro Neuroscience of Behavior# (3)                    |
| FIW 4424 Ichthyology#^ (4)                    | PSYC 4064 Physiological Psychology# (3)                          |
| FIW 4614 Fish Ecology# (3)                    | PSYC 4264 Laboratory in Phys Psc# (1)                            |

**Degree Core Requirements**  
**Biological Sciences Major Requirements**  
**Biological Sciences Electives**  
**Total Pathways General Education Requirements:**  
**Total Free Electives**  
**Total Credits Required for Graduation**

**20 Credits**  
**19 Credits**  
**22 Credits**  
**45 Credits**  
**14 Credits**  
**120 Credits**

**Notes:**

Students must have an in-major and overall GPA of 2.0 to graduate.

All BIOL courses (except 1004, 1214 and 3814), any course taken to fulfill Biological Sciences elective credit, and all required CHEM, MATH, PHYS and STAT courses will be used to calculate in-major GPA.

BIOL 4964 may not be used as Biological Sciences elective but will be used to calculate in-major GPA.

BIOL majors who also are enrolled in the Microbiology major (no option) may count a maximum of 9 credits from the following courses toward the 22 required BIOL elective credits (section 2c): BIOL 3104, 3774, 3454, 3604, 4164, 4624, 4634, 4644, 4664, 4674, 4704, 4714, 4734, 4804, 4824, 4994, BCHM 3114, PPWS 4114, and FST 4634.

BIOL majors who also are enrolled in the Microbiology Biomedical option may count a maximum of 9 credits from the following courses toward the 22 required BIOL elective credits (section 2c): BIOL 3104, 3774, 3454, 3604, 4624, 4634, 4644, 4664, 4674, 4704, 4714, 4734, 4994, and BCHM 3114.

<sup>1</sup> Students must earn a grade of "C" or better in BIOL 1105, 1106, 1115, 1116, CHEM 1035, CHEM 1036, or the equivalent. Only two attempts, including course withdrawals with grade of "W", are allowed for each course.

<sup>2</sup> BIOL 1004 is required but will not be used to calculate in-major GPA.

<sup>3</sup> A combined maximum of 4 credits of BIOL 4974 and/or BIOL 4994 taken A-F can be used toward Biological Sciences elective credit.

<sup>^</sup> Course has major restriction: students may ask FiW to be added if seats are available.

<sup>#</sup> Some courses listed on this checksheet may have prerequisites; please consult the University Course Catalog or check with your advisor.

**\*Acceptable Substitutions**

<u>Required Course</u>	<u>Acceptable Substitution(s)</u>
BIOL 1004:	Any approved First-Year Experience (FYE) course
BIOL 1105, 1115:	BIOL 1205H Honors Biology (4)
BIOL 1106, 1116:	BIOL 1206H Honors Biology (4)
BIOL 2604:	BIOL 2604H Honors General Microbiology
BIOL 2704:	BIOL 2704H Honors Evolutionary Biology
BIOL 2804:	BIOL 2804H Honors Ecology
BIOL 4474:	PSYC 2074 Animal Behavior
BIOL 4994:	BIOL 2994 Undergraduate Research
CHEM 1035-1036:	CHEM 1055 -1056 General Chemistry for Majors
CHEM 1045-1046:	CHEM 1065-1066 General Chemistry Lab for Majors
CHEM 2535-2536:	CHEM 2565-2566 Principles of Organic Chemistry
CHEM 2545-2546:	CHEM 2555-2556 Organic Synthesis and Techniques Lab
PHYS 2205, 2215:	PHYS 2305 Foundations of Physics
PHYS 2206, 2216:	PHYS 2306 Foundations of Physics
MATH 1025:	MATH 1225 Calculus of a Single Variable
MATH 1026:	MATH 1226 Calculus of a Single Variable
NEUR 2025-2026:	APSC 2025-2026 Introduction to Neuroscience

**Cross listed Courses on this Checksheet**

NEUR/APSC 2025-2026: Introduction to Neuroscience  
BIOL/HORT 2304: Plant Biology  
ALS/BIOL 2404: Biotechnology in a Global Society  
ENT/BIOL 3014: Insect Biology  
ENT/BIOL 3024: Insect Biology Laboratory  
CSES/ENSC/GEOS 3114: Soils  
CSES 3124 / ENSC 3124 / GEOS 3624: Soils Laboratory  
ENT/BIOL 3254: Med & Vet Entomology  
ENT/BIOL 3264: Med & Vet Entomology Lab  
FST/BIOL 3604: Food Microbiology  
ENSC/BIOL 4164: Environmental Microbiology  
ENT/BIOL 4354: Aquatic Entomology  
ENT/FiW/BIOL 4484: Freshwater Biomonitoring  
ALS/BIOL 4554: Neurochemical Regulation  
ALS/BIOL 4574: Soc Behavior Birds & Mammals

**Satisfactory Progress Toward Degree**

1. Students must earn a grade of "C" or better in BIOL 1105, 1106, 1115, 1116, CHEM 1035, CHEM 1036 or equivalent upon attempting 45 credit hours (including transfer credit, advance placement or IB credit, advance standing credit, credit by examination, courses taken P/F, and courses completed with a grade of "W"). Only two attempts are allowed for each course.
2. Students must achieve an overall GPA of 2.0 and in-major GPA of 2.2 upon attempting 45 credit hours (including transfer credit, advanced placement or IB credit, advance standing credit, credit by examination, courses taken P/F, and courses completed with a grade of "W").
3. All BIOL courses (except 1004, 1214 and 3814), any course taken to fulfill Biological Sciences elective credit, and all required CHEM, MATH, PHYS, and STAT courses will be used to calculate in-major GPA.

**College of Science Foreign Language Requirement:**

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six semester hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduation. Please consult the Undergraduate Catalog for details.