

MAJOR IN BIOLOGY

Completion of the biology major provides students with a solid foundation in the wide breadth of disciplines that make up this field of study including cellular and molecular biology, physiology, ecology and evolution. Students selecting to complete the degree without a specific concentration will be able to take a mix of electives from these fields at the upper level. In addition, the general biology major will help prepare students for advanced studies in biology, particular those programs with an integrative nature. Students are encouraged to participate in a research experience or as an intern (e.g., BIOL 491, BIOL 493 or BIOL 499). They should consult with their adviser regarding these opportunities.

Specific requirements for the Biology major are listed under Requirements and outlined in the suggested Four-Year Plan of Study. A complete list of Biology courses that **do not** count towards the Biology major may be found on the Resources for Students web page.

Requirements

The Biology major consists of 52-75 units. All Biology majors must complete minimum 19 units toward the major at Towson University, with at least 10 of these units at the upper (300-400) level. Courses taken to fulfill Ancillary Course requirements do not count toward units in residence.

Code	Title	Units
Foundation Courses		
BIOL 200 & 200L	BIOLOGY I: INTRODUCTION TO CELLULAR BIOLOGY AND GENETICS [LECTURE] and BIOLOGY I: INTRODUCTION TO CELLULAR BIOLOGY AND GENETICS [LAB]	4
BIOL 204	EDUCATIONAL AND CAREER PLANNING FOR THE BIOLOGIST	1
BIOL 206 & 206L	BIOLOGY II: INTRODUCTION TO ECOLOGY AND EVOLUTION [LECTURE] and BIOLOGY II: INTRODUCTION TO ECOLOGY AND EVOLUTION [LAB]	4
Intermediate Courses: Genetics, Biodiversity and Physiology		
BIOL 309	GENETICS	4
Select one Biodiversity option from the following:		3-8
BIOL 205 & BIOL 207	GENERAL BOTANY and GENERAL ZOOLOGY	
BIOL 208	BIODIVERSITY	
Select one Physiology option from the following:		3-8
BIOL 325	ANIMAL PHYSIOLOGY ¹	
BIOL 436	PLANT PHYSIOLOGY	
BIOL 342 & BIOL 343	HUMAN ANATOMY AND PHYSIOLOGY I FOR BIOLOGY MAJORS and HUMAN ANATOMY AND PHYSIOLOGY II FOR BIOLOGY MAJORS ¹	
Ancillary Courses		
Chemistry		
CHEM 131 & 131L	GENERAL CHEMISTRY I LECTURE and GENERAL CHEMISTRY I LABORATORY	4
CHEM 132 & 132L	GENERAL CHEMISTRY II LECTURE and GENERAL CHEMISTRY II LABORATORY	4

CHEM 330 or CHEM 331 & CHEM 332	ESSENTIALS OF ORGANIC CHEMISTRY ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY II	5-10
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Mathematics

Select one of the following: 3-4

MATH 211	CALCULUS FOR APPLICATIONS	
MATH 237	ELEMENTARY BIostatISTICS	
MATH 273	CALCULUS I	
PSYC 212	BEHAVIORAL STATISTICS	

Physics

PHYS 211 or PHYS 241	GENERAL PHYSICS I; NON CALCULUS-BASED GENERAL PHYSICS I CALCULUS-BASED	4
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Electives

Select one from the following: 3-4

BIOL 408	CELL BIOLOGY	
BIOL 409	MOLECULAR BIOLOGY	
BIOL 470	ADVANCED PHYSIOLOGY	
CHEM 351	BIOCHEMISTRY	

Select one from the following: 3-4

BIOL 310	CONSERVATION BIOLOGY	
BIOL 402	GENERAL ECOLOGY	
BIOL 405	MOLECULAR ECOLOGY, EVOLUTION AND CONSERVATION	
BIOL 413	EVOLUTION	

Select minimum three upper (300-400) level elective courses not already taken from any courses that may be counted toward any concentration of the major (excluding ancillary and UTeach courses). One elective course must be a lecture/laboratory course, a laboratory course, or BIOL 491. ²

Total Units 52-75

¹ Only one of BIOL 325 or BIOL 342 may be counted toward the major.

² Other non-Biology STEM electives may be selected with the approval of the student's major advisor or the department chairperson.

Four-Year Plan of Study

Suggested Four-Year Plan

Based on course availability and student needs and preferences, the selected sequences will probably vary from those presented below. Students should consult with their adviser to make the most appropriate elective choices.

Freshman

Term 1	Units Term 2	Units
BIOL 200 & 200L	4 BIOL 206 & 206L	4
MATH 115 or 119 (Core 3) ¹	3 CHEM 131 & 131L (Core 7)	4
Core 1 (or Core 2)	3 MATH 211, 237, 273, or PSYC 212	3-4
Core 4	3 Core 2 (Core 1)	3
Core 5	3 Core 12	3
16		17-18

Sophomore

Term 1	Units Term 2	Units
BIOL 205 or 208	4 BIOL 207 (or elective)	4
BIOL 204 ²	1 Required Elective	4
BIOL 309	4 PHYS 211 or 241 ⁴	4
CHEM 132 & 132L (Core 8)	4 Elective	2-3
Core 10	3 Core 9	3
	16	17-18

Junior

Term 1	Units Term 2	Units
BIOL 325, 342, or 436 ⁵	4 BIOL 343 (or elective) ⁵	4
Required Elective	4 CHEM 332 (or elective) ³	5
CHEM 330 or 331	5 Required Elective	3-4
Core 6	3 Elective	3-4
	16	15-17

Senior

Term 1	Units Term 2	Units
BIOL 310, 402, 405, or 413	4 Core 11	3
BIOL 408, 409, 470, or CHEM 351	4 Core 13	3
Core 14	3 Elective	3-4
Elective	3-4 Elective	3-4
	14-15	12-14

Total Units 123-130

¹ MATH 237 and PSYC 212 can be substituted for a Calculus course depending on career objectives. Consult your adviser.

² A major assignment in BIOL 204 is the development of your own Degree Completion Plan.

³ CHEM 330 can be substituted for CHEM 331 and CHEM 332 depending on career objectives. Consult your adviser.

⁴ PHYS 241 and PHYS 242 can be substituted for PHYS 211 and PHYS 212 if Calculus prerequisites are met (requires MATH 273 and MATH 274).

⁵ Your choice for physiology BIOL 342 & BIOL 343 or BIOL 325 or BIOL 436) depends on your career objectives. Consult your adviser. Students selecting BIOL 325 or BIOL 436 will also need to complete a free elective.

Learning Outcomes

- Explain the core concepts and principles of Biology.
- Demonstrate the scientific method through the use of hypothesis testing in the design and implementation of an experiment.
- Utilize scientific methodologies from the biological sciences in the evaluation of issues in society.
- Apply appropriate critical-thinking/problem-solving skills in biological sciences.
- Communicate both verbally and in writing in discipline specific contexts.
- Identify fundamental similarities and differences among various fields of study within the Biological Sciences.