

# BIOLOGY EDUCATION

## Graduation Requirements:

- A minimum 2.0 average in all biology courses required for this major
- A minimum of 32 credits at or above the 30000-level completed at a Purdue campus
- At least one 50000-level Biology course other than BIOL 50000 or 54200
- 124 Total Credits

## **BIOLOGY:**

1. BIOL 12100 Biology I: Diversity, Ecology and Behavior (2 cr.; fall)
2. BIOL 13100 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring)
3. BIOL 13500 First Year Biology Lab (2 cr.; both)
4. BIOL 23100 Biology III: Cell Structure and Function (3 cr.; fall)
5. BIOL 23200 Laboratory in Biology III: Cell Structure and Function (2 cr.; fall)
6. BIOL 24100 Biology IV: Genetics and Molecular Biology (3 cr.; spring)
7. BIOL 24200 Laboratory in Genetics and Molecular Biology (2 cr.; spring)
8. BIOL 28600 Introduction to Ecology (2 cr.; spring)
9. **One of these four options:**
  - A. BIOL 39500<sup>1,2</sup> Macromolecules (3 cr.; fall)
  - B. BIOL 39500<sup>1,2</sup> Principles of Development (4 cr.; spring)
  - C. BIOL 39500<sup>1,2</sup> Principles of Physiology (4 cr.; spring)
  - D. BIOL 43800<sup>1,2</sup> General Microbiology (3 cr.; fall) **and** BIOL 43900<sup>1,2</sup> Microbiology Lab (2 cr.; fall)
10. **Ten credits** from the following: must choose at least **one** from each of Groups A and B, and at least **one** course from the Laboratory list below.

### **Group A:**

BIOL 39500 <sup>1</sup>	Macromolecules (3 cr.; fall)	BIOL 53300	Medical Microbiology (3 cr.; fall)
BIOL 41500	Intro. to Molecular Biology (3 cr.; fall)	BIOL 53800	Molecular, Cellular & Developmental Neurobiology (3 cr.; spring)
BIOL 41600	Viruses and Viral Diseases (3 cr.; spring)	BIOL 54100	Molecular Genetics of Bacteria (3 cr.; fall)
BIOL 42000	Eukaryotic Cell Biology (3 cr.; fall)	BIOL 54900	Microbial Ecology (2 cr.; alternate spring)
BIOL 43600	Neurobiology (3 cr.; fall)	BIOL 55000	Plant Molecular Biology (3 cr.; spring)
BIOL 43800 <sup>1</sup>	General Microbiology (3 cr.; fall)	BIOL 56200	Neural Systems (3 cr.; spring)
BIOL 43900 <sup>1</sup>	Microbiology Lab (2 cr.; fall)	BIOL 57300	Molecular Biology of Animal Cells (3 cr.; fall)
BIOL 44400	Human Genetics (3 cr.; fall)	BIOL 59500	Protein Bioinformatics (2 cr.; spring)
BIOL 44600	Cellular Microbiology (3 cr.; spring)	BIOL 59500	Methods & Measurement in Physical Biochemistry (3 cr.; fall)
BIOL 47800	Intro to Bioinformatics (3 cr.; fall)	BIOL 59500	Cellular Biology of Plants (3 cr.; fall)
BIOL 48100	Eukaryotic Genetics (3 cr.; spring)	BCHM 56100 <sup>2</sup>	General Biochemistry I (3 cr.; both)
BIOL 51100	Intro. to X-Ray Crystallography (3 cr.; spring)	BCHM 56200	General Biochemistry II (3 cr.; both)
BIOL 51400	Laboratory in Crystallography (2 cr.; fall)	BCHM 57200	Adv. Biochemical Techniques (2-4 cr.; fall)
BIOL 51600	Molecular Biology of Cancer (3 cr.; spring)	CHM 53300 <sup>2</sup>	Introductory Biochemistry (3 cr.; fall)
BIOL 51700	Molecular Biology: Proteins (2 cr.; spring)		
BIOL 52900	Bacterial Physiology (3 cr.; spring)		

### **Group B:**

BIOL 30100 <sup>3</sup>	Human Anatomy & Physiology (3 cr.; fall)	BIOL 58000	Evolution (3 cr.; spring)
BIOL 30200 <sup>3</sup>	Human Anatomy & Physiology (3 cr.; spring)	BIOL 58500	Ecology (3 cr.; fall)
BIOL 39500 <sup>1</sup>	Principles of Development (4 cr.; spring)	BIOL 59100	Field Ecology (4 cr.; alternate fall)
BIOL 39500 <sup>1</sup>	Principles of Physiology (4 cr.; spring)	BIOL 59200	Evolution of Behavior (3 cr.; spring)
BIOL 43200	Reproductive Physiology (3 cr.; fall)	BIOL 59500	Animal Communication (3 cr.; alternate fall)
BIOL 48300	Environmental & Conservation Biology (3 cr.; fall)	BIOL 59500	Developmental Biology (3 cr.; spring)
BIOL 49300	Intro. to Ethology (3 cr.; fall)	BIOL 59500	Physiology BioDesign Laboratory (2 cr.; fall)
BIOL 53700	Immunology (3 cr.; spring)	BIOL 59700	Sex and Evolution (3 cr.; alternate fall)
BIOL 55900	Endocrinology (3 cr.; fall)	HORT 30100	Plant Physiology (4 cr.; fall)

### **Laboratory:** Choose one option:

BIOL 43900	Microbiology Lab (2 cr.; fall)	BIOL 59100	Field Ecology (4 cr.; alternate fall)
BIOL 50000	Protein Expression (2 cr.; both) <b>and</b> at least one additional credit of BIOL 50000 (2 cr.; both) or 54200 (1 cr.; both) (various titles)	BIOL 59500	Physiology BioDesign Laboratory (2 cr.; fall)

Research (49400 or 49900), (maximum of 2 credits) will count toward the 10 credit requirement but will not count toward the Group A or B or the laboratory requirement.

<sup>1</sup> BIOL 39500 (Development), 39500 (Macromolecules), 39500 (Physiology), 43800, and 43900 may satisfy #9 above **and** still count as part of the 10 credit requirement (#10).

<sup>2</sup> These courses are recommended for teaching majors.

<sup>3</sup> If **both** BIOL 30100 & 30200 are completed, **three** of the six credits will count toward the 10 credit biology elective requirement. The other three credits will count as free electives. If **only** BIOL 30100 **or** 30200 is completed, the credits will count **only** as free elective credit.

Other requirements are on the back of this page.

## **CHEMISTRY**

1. CHM 11500 General Chemistry (4 cr.; both)
2. CHM 11600 General Chemistry (4 cr.; both)
3. One of these three options:
  - A. CHM 25500 Organic Chemistry (3 cr.; both) and CHM 25501 Organic Chemistry Lab (1 cr.; both) and CHM 25600 Organic Chemistry (3 cr.; both) and CHM 25601 Organic Chemistry Lab (1 cr.; both)
  - B. CHM 26505 Organic Chemistry (3 cr.; fall) and CHM 26300 Organic Chemistry Lab (1 cr.; fall) and CHM 26605 Organic Chemistry (3 cr.; spring) and CHM 26400 Organic Chemistry Lab (1 cr.; spring)
  - C. CHM 25700 Organic Chemistry (4 cr.; both) and CHM 25701 Organic Chemistry Lab (1 cr.; both) and one of: CHM 33300 Principles of Biochemistry (3 cr.; both) or BCHM 30700 Biochemistry (3 cr.; both)

## **EDUCATION**

1. EDCI 20500 Exploring Teaching as a Career (3 cr.; both)
2. EDCI 28500 Multiculturalism and Education (3 cr.; both)
3. EDPS 23500 Learning and Motivation (3 cr.; both)
4. EDPS 26500 The Inclusive Classroom (3 cr.; both)
5. EDCI 27000 Introduction to Educational Technology and Computing (2 cr.; both)
6. EDST 20000 History and Philosophy of Education (3 cr.; both)
7. EDCI 42100 The Teaching of Biology in Secondary Schools (3 cr.; fall)
8. EDCI 42800 Teaching Science in the Middle and Junior High School (2 cr.; spring)
9. EDCI 49800 Supervised Teaching Life Science Education (10 cr.; both)

## **PHYSICS**

One of these two options:

1. PHYS 22000 General Physics (4 cr.; both) and PHYS 22100 General Physics (4 cr.; both)
2. PHYS 17200 Modern Mechanics (4 cr.; both) and one of the following two choices:
  - A. PHYS 27200 Electric and Magnetic Interactions (4 cr.; both) or
  - B. PHYS 24100 Electricity and Optics (3 cr.; both) and PHYS 24200 Intro to Heat and Thermal Physics (1 cr.; spring) and PHYS 25200 Electricity and Optics Laboratory (1 cr.; spring)

## **COLLEGE OF SCIENCE CORE REQUIREMENTS**

Composition and Presentation; Teambuilding and Collaboration; Language and Culture; Great Issues; General Education; Multidisciplinary Experience; Mathematics; Statistics; Computing (see handout).

**FREE ELECTIVES**      Approximately 0 - 6 credits