

# 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 300-level completed at a Purdue campus
- At least one 500-level Biology course other than BIOL 500 or 542
- 124 Total Credits

## **BIOLOGY:**

1. BIOL 121 Biology I: Diversity, Ecology and Behavior (2 cr.; fall)
2. BIOL 131 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring)
3. BIOL 195T First Year Biology Lab (2 cr.; both)
  
4. BIOL 231 Biology III: Cell Structure and Function (3 cr.; fall)
5. BIOL 232 Laboratory in Biology III: Cell Structure and Function (2 cr.; fall)
6. BIOL 241 Biology IV: Genetics and Molecular Biology (3 cr.; spring)
7. BIOL 242 Laboratory in Genetics and Molecular Biology (2 cr.; spring)
8. BIOL 286 Introduction to Ecology (2 cr.; spring)
  
9. **One of these three options:**
  - A. BIOL 395G<sup>1,2</sup> Principles of Physiology (3 cr.; fall)
  - B. BIOL 395Y<sup>1,2</sup> Principles of Development (4 cr.; spring)
  - C. BIOL 438<sup>1,2</sup> General Microbiology (3 cr.; fall) **and** BIOL 439<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 415	Intro. to Molecular Biology (3 cr.; fall)	BIOL 533	Medical Microbiology (3 cr.; fall)
BIOL 416	Molecular Virology (3 cr.; spring)	BIOL 538	Molecular, Cellular & Developmental Neurobiology (3 cr.; spring)
BIOL 420	Eukaryotic Cell Biology (3 cr.; fall)	BIOL 541	Molecular Genetics of Bacteria (3 cr.; fall)
BIOL 438 <sup>1,2</sup>	General Microbiology (3 cr.; fall)	BIOL 550	Plant Molecular Biology (3 cr.; spring)
BIOL 439 <sup>1,2</sup>	Microbiology Lab (2 cr.; fall)	BIOL 562 <sup>2</sup>	Neural Systems (3 cr.; spring)
BIOL 444 <sup>2</sup>	Human Genetics (3 cr.; fall)	BIOL 573	Molecular Biology of Animal Cells (3 cr.; fall)
BIOL 446	Cellular Microbiology (3 cr.; spring)	BIOL 595A	Protein Bioinformatics (2 cr.; spring)
BIOL 478	Intro to Bioinformatics (3 cr.; fall)	BIOL 595K	Methods & Measurement in Physical Biochemistry (3 cr.; fall)
BIOL 481	Eukaryotic Genetics (3 cr.; spring)	BIOL 595Z	Cellular Biology of Plants (3 cr.; fall)
BIOL 495N	Intro. to Neurobiology (3 cr.; fall)	BCHM 561	General Biochemistry I (3 cr.; both)
BIOL 511	Intro. to X-Ray Crystallography (3 cr.; spring)	BCHM 562	General Biochemistry II (3 cr.; both)
BIOL 514	Laboratory in Crystallography (2 cr.; fall)	BCHM 572	Adv. Biochemical Techniques (2-4 cr.; fall)
BIOL 516	Molecular Biology of Cancer (3 cr.; spring)	CHM 533	Introductory Biochemistry (3 cr.; fall)
BIOL 517	Molecular Biology: Proteins (2 cr.; spring)		
BIOL 529	Bacterial Physiology (3 cr.; spring)		

### **Group B:**

BIOL 301 <sup>2,3</sup>	Human Anatomy & Physiology (3 cr.; fall)	BIOL 580	Evolution (3 cr.; spring)
BIOL 302 <sup>2,3</sup>	Human Anatomy & Physiology (3 cr.; spring)	BIOL 585 <sup>2</sup>	Ecology (3 cr.; fall)
BIOL 395G	Principles of Physiology (3 cr.; fall)	BIOL 591	Field Ecology (4 cr.; alternate fall)
BIOL 395Y <sup>1,2</sup>	Principles of Development (4 cr.; spring)	BIOL 592	Evolution of Behavior (3 cr.; spring)
BIOL 455 <sup>2</sup>	Animal Physiology (3 cr.; spring)	BIOL 595D	Developmental Biology (3 cr.; spring)
BIOL 483	Environmental & Conservation Biology (3 cr.; fall)	BIOL 595G	Animal Communication (3 cr.; alternate fall)
BIOL 493	Intro. to Ethology (3 cr.; fall)	BIOL 597	Sex and Evolution (3 cr.; alternate fall)
BIOL 495I	Reproductive Physiology (3 cr.; fall)	HORT 301 <sup>2</sup>	Plant Physiology (4 cr.; fall)
BIOL 537	Immunology (3 cr.; spring)		
BIOL 559 <sup>2</sup>	Endocrinology (3 cr.; fall)		

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

BIOL 439 <sup>2</sup>	Microbiology Lab (2 cr.; fall)
BIOL 500I	Protein Expression (2 cr.; both) <b>and</b> at least one additional credit of BIOL 500 (2 cr.; both) or 542 (1 cr.; both) (various titles)
BIOL 514	Laboratory in Crystallography (2 cr.; fall)
BIOL 591	Field Ecology (4 cr.; alternate fall)

Research (394 or 494 or 499), (maximum of 3 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 395G, 395x, 438, and 439 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 301 & 302 are completed, **three** of the six credits will count toward the 15 credit biology elective requirement. The other three credits will count as free electives. If **only** BIOL 301 **or** 302 is completed, the credits will count **only** as free elective credit.

*Other requirements are on the back of this page.*

## **CHEMISTRY**

1. CHM 115 General Chemistry (4 cr.; both)
2. CHM 116 General Chemistry (4 cr.; both)
3. One of these three options:
  - A. CHM 255 Organic Chemistry (3 cr.; both) and CHM 255L Organic Chemistry Lab (1 cr.; both) and CHM 256 Organic Chemistry (3 cr.; both) and CHM 256L Organic Chemistry Lab (1 cr.; both)
  - B. CHM 261 Organic Chemistry (3 cr.; fall) and CHM 263 Organic Chemistry Lab (1 cr.; fall) and CHM 262 Organic Chemistry (3 cr.; spring) and CHM 264 Organic Chemistry Lab (1 cr.; spring)
  - C. CHM 257 Organic Chemistry (4 cr.; both) and CHM 257L Organic Chemistry Lab (1 cr.; both) and one of: CHM 333 Principles of Biochemistry (3 cr.; both) or BCHM 307 Biochemistry (3 cr.; both)

## **EDUCATION**

1. COM 114 Fundamentals of Speech Communication (3 cr.; both)
2. EDCI 205 Exploring Teaching as a Career (3 cr.; both)
3. EDCI 285 Multiculturalism and Education (3 cr.; both)
4. EDPS 235 Learning and Motivation (3 cr.; both)
5. EDPS 265 The Inclusive Classroom (3 cr.; both)
6. EDCI 270 Introduction to Educational Technology and Computing (2 cr.; both)
7. EDST 200 History and Philosophy of Education (3 cr.; both)
8. EDCI 421 The Teaching of Biology in Secondary Schools (3 cr.; fall)
9. EDCI 428 Teaching Science in the Middle and Junior High School (2 cr.; spring)
10. EDCI 498V Supervised Teaching Life Science Education (10 cr.; both)

## **PHYSICS**

One of these two options:

1. PHYS 220 General Physics (4 cr.; both) and PHYS 221 General Physics (4 cr.; both)
2. PHYS 172 Modern Mechanics (4 cr.; both) and PHYS 272 Electric and Magnetic Interactions (4 cr.; both)

## **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 - 9 credits