

# CELL, MOLECULAR AND DEVELOPMENTAL BIOLOGY

## 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 54200
- 120 Total Credits

## BIOLOGY:

1. BIOL 12100 Biology I: Diversity, Ecology and Behavior (2 cr.; fall) **or**  
BIOL 19500 Biodiversity, Ecology & Evolution (3 cr.; fall)
2. BIOL 13100 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring) **or**  
BIOL 19500 Organismal Development & Physiology (3 cr.; spring)
3. BIOL 13500 1<sup>st</sup> Year Biology Lab (2 cr.; both) **or**  
BIOL 14501 1<sup>st</sup> Year Biology Lab w/Neuro Research Project (2 cr.; fall) **or**  
IT 22600 Biotechnology Lab (2 cr.; fall)
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 Intro. to Ecology and Evolution (2 cr.; spring)
9. **Intermediate Biology Selective:** Choose one of these eight options:  
(**Cell, Molecular, and Developmental Biology majors must take BIOL 36700, 41500 or 42000 for this requirement.**)
 

<ol style="list-style-type: none"> <li>A. BIOL 32800 Principles of Physiology (4 cr.; spring)</li> <li><b>B. BIOL 36700 Principles of Development</b> (2 cr.; spring) <b>plus</b> BIOL 36701<sup>1</sup> <b>Principles of Development Laboratory</b> (1 cr.; spring)</li> <li>C. BIOL 39500 Macromolecules (3 cr.; fall)</li> </ol>	<ol style="list-style-type: none"> <li><b>D. BIOL 41500 Intro. to Molecular Biology</b> (3 cr.; fall)</li> <li>E. BIOL 41600 Viruses &amp; Viral Diseases (3 cr.; spring)</li> <li><b>F. BIOL 42000 Eukaryotic Cell Biology</b> (3 cr.; fall)</li> <li>G. BIOL 43600 Neurobiology (3 cr.; fall)</li> <li>H. BIOL 43800 General Microbiology (3 cr.; fall)</li> </ol>
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10. **CMDB Selectives I:** (choose two - may not overlap with #9 above)
 

<ol style="list-style-type: none"> <li>A. BIOL 36700 Principles of Development (2 cr.; spring) <b>plus</b> BIOL 36701<sup>1</sup> Principles of Development Laboratory (1 cr.; spring)</li> </ol>	<ol style="list-style-type: none"> <li>B. BIOL 41500 Intro. to Molecular Biology (3 cr.; fall)</li> <li>C. BIOL 42000 Eukaryotic Cell Biology (3 cr.; fall)</li> <li>D. BIOL 48100 Eukaryotic Genetics (3 cr.; spring)</li> </ol>
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11. **Chemistry Selective** One of these three courses:
  - A. BCHM 56100 General Biochemistry I (3 cr.; fall) **or**
  - B. CHM 33900<sup>4</sup> Biochemistry: A Molecular Approach (3 cr.; Spring) **or**
  - C. CHM 53300 Introductory Biochemistry (3 cr.; fall)
12. BIOL 44201<sup>1</sup> Introductory Module: Protein Expression **plus** two additional modules of BIOL 442xx<sup>1</sup> (1-2 cr.; both) (various titles) **OR** 54200<sup>1</sup> (1 cr.; both) Neurophysiology (1 cr.; fall)
13. **CMDB Selective II** One of these six courses:
 

<ol style="list-style-type: none"> <li>A. BIOL 51600 Molecular Biology of Cancer (3 cr.; spring)</li> <li>B. BIOL 55001 Eukaryotic Molecular Biology (3 cr.; fall)</li> <li>C. BIOL 59500 Cellular Biology of Plants (3 cr.; alternate fall)</li> <li>D. BIOL 59500 Epigenetics in Human Disease (3 cr.; fall)</li> </ol>	<ol style="list-style-type: none"> <li>E. BIOL 59500 Genetics and –Omics of Host-Microbe Interaction (3 cr.; fall)</li> <li>F. BIOL 59500 Theory of Molecular Methods (3 cr.; fall)</li> </ol>
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14. **Biology Selectives:** Three credits of the following:  
(course chosen for this requirement may **not** be used for any other requirement above).
 

<ul style="list-style-type: none"> <li>BIOL 39500 Macromolecules (3 cr.; fall)</li> <li>BIOL 41600 Viruses and Viral Diseases (3 cr.; spring)</li> <li>BIOL 43200 Reproductive Physiology (3 cr.; alternate fall)</li> <li>BIOL 43600 Neurobiology (3 cr.; fall)</li> <li>BIOL 43800 General Microbiology (3 cr.; fall)</li> <li>BIOL 43900 Microbiology Lab (2 cr.; fall)</li> <li>BIOL 44400 Human Genetics (3 cr.; fall)</li> <li>BIOL 44600 Molecular Biology of Pathogens (3 cr.; spring)</li> <li>BIOL 47800 Intro to Bioinformatics (3 cr.; fall)</li> <li>BIOL 48100 Eukaryotic Genetics (3 cr.; spring)</li> <li>BIOL 48300 Environmental &amp; Conservation Biology (3 cr.; spring)</li> <li>BIOL 49500 Biological &amp; Structural Aspects of Drug Design &amp; Action (3 cr.; spring)</li> <li>BIOL 51100 Intro. to X-Ray Crystallography (3 cr.; spring)</li> <li>BIOL 51600 Molecular Biology of Cancer (3 cr.; spring)</li> <li>BIOL 51700 Molecular Biology: Proteins (2 cr.; spring)</li> <li>BIOL 52900 Bacterial Physiology (3 cr.; spring)</li> <li>BIOL 53300 Medical Microbiology (3 cr.; fall)</li> <li>BIOL 53700 Immunology (3 cr.; spring)</li> <li>BIOL 53800 Molecular, Cellular &amp; Developmental Neurobiology (3 cr.; spring)</li> <li>BIOL 54100 Molecular Genetics of Bacteria (3 cr.; fall)</li> </ul>	<ul style="list-style-type: none"> <li>BIOL 54900 Microbial Ecology (2 cr.; alternate spring)</li> <li>BIOL 55001 Eukaryotic Molecular Biology (3 cr.; fall)</li> <li>BIOL 55900 Endocrinology (3 cr.; fall)</li> <li>BIOL 56200 Neural Systems (3 cr.; spring)</li> <li>BIOL 58000 Evolution (3 cr.; spring)</li> <li>BIOL 58500 Ecology (3 cr.; fall)</li> <li>BIOL 58705 Animal Communication (3 cr.; alternate fall)</li> <li>BIOL 59100 Field Ecology (4 cr.; alternate fall)</li> <li>BIOL 59200 Evolution of Behavior (3 cr.; alternate spring)</li> <li>BIOL 59500 Cellular Biology of Plants (3 cr.; fall)</li> <li>BIOL 59500 Ecological Statistics (3 cr.; fall)</li> <li>BIOL 59500 Epigenetics in Human Disease (3 cr.; fall)</li> <li>BIOL 59500 Methods &amp; Measurement in Physical Biochemistry (3 cr.; fall)</li> <li>BIOL 59500 Genetics and –Omics of Host-Microbe Interaction (3 cr.; fall)</li> <li>BIOL 59500 Neural Mechanisms in Health &amp; Disease (3 cr.; fall)</li> <li>BIOL 59500 Neurobiology of Learning &amp; Memory (3 cr.; fall)</li> <li>BIOL 59500 Protein Bioinformatics (2 cr.; spring)</li> <li>BIOL 59500 Sensory Ecology (3 cr.; alternate spring)</li> <li>BIOL 59500 Theory of Molecular Methods (3 cr.; spring)</li> </ul>
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## **CHEMISTRY**

### 1. **General Chemistry:**

- a. CHM 12901<sup>2</sup> General Chemistry with a Biological Focus (5 cr.; fall)

### 2. **Organic Chemistry Selectives: One of these two 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)

## **PHYSICS Selectives:**

### One of these two options:

1. PHYS 23300 Physics for Life Sciences I (4 cr.; both) **and** PHYS 23400 Physics for Life Sciences II (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 25200 Electricity and Optics Laboratory (1 cr.; spring)

## **UNIVERSITY CORE and 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 8-19 credits

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<sup>1</sup> Three credits of undergraduate research, approved by the Undergraduate Studies Committee, may be used to replace some or all of the lab modules.

<sup>2</sup> Students who select 12901 for General Chemistry must also select CHM 33900 **and** 33901 for the Chemistry Selective. Students who end up with Special Case approval for some other Gen Chem courses may choose the other Chem Selective options.

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