

HEALTH & DISEASE

Fall 2017

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)
2. BIOL 13100 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring)
3. BIOL 13500 1st Year Biology Lab (2 cr.; both) **or**
BIOL 14501 1st Year Biology Lab w/Neuro Research Project (2 cr.; fall) **or**
BIOL 19500 Year I Bio Lab: Disease Ecology (2 cr.; alternate 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 & Evolution (2 cr.; spring)
9. **Intermediate Biology Selective: Choose one of these eight options:**
(Health & Disease majors must choose option H, BIOL 43800)
 - A. BIOL 32800 Principles of Physiology (4 cr.; spring)
 - B. BIOL 36700 Principles of Development (2 cr.; spring)
plus BIOL 36701 Principles of Development Laboratory (1 cr.; spring)
 - C. BIOL 39500 Macromolecules (3 cr.; fall)
 - D. BIOL 41500 Intro. to Molecular Biology (3 cr.; spring)
 - E. BIOL 41600 Viruses & Viral Diseases (3 cr.; spring)
 - F. BIOL 42000 Eukaryotic Cell Biology (3 cr.; fall)
 - G. BIOL 43600 Neurobiology (3 cr.; fall)
 - H. **BIOL 43800 General Microbiology (3 cr.; fall)**
10. BIOL 30100 Human Anatomy & Physiology (3 cr.; fall)
11. BIOL 30200 Human Anatomy & Physiology (3 cr.; spring)
12. **Lab Requirement:** BIOL 43900 Lab in Microbiology (2 cr.; fall)
13. **Health & Disease Selective: One of these three courses¹:**
 - A. BIOL 41600² Viruses & Viral Diseases (3 cr.; spring) **or**
 - B. BIOL 53700² Immunology (3 cr.; spring) **or**
 - C. BIOL 55900² Endocrinology (3 cr.; fall)
14. **Biology Selectives: Six credits** from the following¹:

BIOL 32800 ³	Principles of Physiology (4 cr.; spring)	BIOL 54200	Neurophysiology Lab (1 cr.; fall)
BIOL 36700	Principles of Development (2 cr.; spring)	BIOL 54900	Microbial Ecology (2 cr.; alternate spring)
BIOL 36701	Lab in Principles of Development (1 cr.; spring)	BIOL 55001	Eukaryotic Molecular Biology (3 cr.; fall)
BIOL 39500	Macromolecules (3 cr.; fall)	BIOL 55900 ²	Endocrinology (3 cr.; fall)
BIOL 41500	Intro. to Molecular Biology (3 cr.; spring)	BIOL 56200 ⁴	Neural Systems (3 cr.; spring)
BIOL 41600 ²	Viruses & Viral Diseases (3 cr.; spring)	BIOL 56310	Protein Bioinformatics (3 cr.; alternate spring)
BIOL 42000	Eukaryotic Cell Biology (3 cr.; fall)	BIOL 58000	Evolution (3 cr.; spring)
BIOL 43200	Reproductive Physiology (3 cr.; alternate fall)	BIOL 58210	Ecological Statistics (3 cr.; fall)
BIOL 43600	Neurobiology (3 cr.; fall)	BIOL 58705	Animal Communication (3 cr.; alternate fall)
BIOL 442xx	Modular Laboratory Courses (var titles) (1-2 cr.; both)	BIOL 59100	Field Ecology (4 cr.; alternate fall)
BIOL 44400	Human Genetics (3 cr.; fall)	BIOL 59200	Evolution of Behavior (3 cr.; alternate spring)
BIOL 44600	Molecular Biology of Pathogens (3 cr.; alternate spring)	BIOL 59500	Cellular Biology of Plants (3 cr.; alternate fall)
BIOL 47800 ⁴	Intro to Bioinformatics (3 cr.; fall)	BIOL 59500	Disease Ecology (3 cr.; fall)
BIOL 48100	Eukaryotic Genetics (3 cr.; spring)	BIOL 59500	Ecology (3 cr.; fall)
BIOL 48300 ⁵	Environmental & Conservation Biology (3 cr.; alternate spring)	BIOL 59500	Epigenetics in Human Disease (3 cr.; fall)
BIOL 49500	Biological & Structural Aspects of Drug Design & Action (3 cr.; spring)	BIOL 59500	Genetics & -Omics of Host-Microbe Interaction (3 cr.; fall)
BIOL 51600	Molecular Biology of Cancer (3 cr.; spring)	BIOL 59500	Intro. to X-Ray Crystallography (3 cr.; spring)
BIOL 51700	Molecular Biology: Proteins (2 cr.; alternate spring)	BIOL 59500	Methods & Measurement in Physical Biochemistry (3 cr.; fall)
BIOL 52900	Bacterial Physiology (3 cr.; spring)	BIOL 59500	Neural Mechanisms in Health & Disease (3 cr.; fall)
BIOL 53300	Medical Microbiology (3 cr.; fall)	BIOL 59500	Neurobiology of Learning and Memory (3 cr.; alternate fall)
BIOL 53700 ²	Immunology (3 cr.; spring)	BIOL 59500	Sensory Ecology (3 cr.; alternate spring)
BIOL 53800	Molecular, Cellular & Developmental Neurobiology (3 cr.; spring)	BIOL 59500	Theory of Molecular Methods (3 cr.; fall)
BIOL 54100	Molecular Genetics of Bacteria (3 cr.; alternate fall)	HORT 30100	Plant Physiology (4 cr.; fall)

Research (49400 or 49900, maximum of 3 credits) will count toward the Biology Selective requirement.

Footnotes and other requirements are on the back of this page.

Base Laboratory Requirement for all Biology Majors (Health & Disease majors are required to take **BIOL 43900** to satisfy this)

- Each student will satisfy each of the following three learning objectives:

Objective 1 – Research planning, literature review, and writing

Objective 2 – Observation, experimentation

Objective 3 – Analysis, simulation, and presentation

- Objectives may be met by taking courses according the following chart:

Courses	Title	Object. 1	Object. 2	Object. 3
BIOL 43900	Microbiology Lab	X	X	X
BIOL 44201	Protein Expression		X	X
BIOL 44202	Animal Physiology		X	X
BIOL 44205	LabView		X	X
BIOL 44207	Protein Structure		X	
BIOL 44211	Anatomy & Physiology		X	
BIOL 44212	Microscopy & Cell Bio		X	X
BIOL 44215	Physiology Measurements	X		X
BIOL 54200	Neurophysiology		X	X
BIOL 58210	Ecological Statistics	X		X
BIOL 59100	Field Ecology	X	X	X
BIOL 59500	CryoEM 3D Reconstruction		X	X
BIOL 59500	Data Analysis in Neurosci			X
BIOL 59500	Theory of Molecular Methods	X		X
BIOL 59500	Neural Mech in Hlth Disease	X		X

- Students who successfully complete a Biology Honors Research Thesis have successfully met all three objectives.
- Undergraduate Research may be used to meet these objectives. Student must get Research Mentor approval for each objective after that objective is completed. Student must also earn at least four credits of BIOL 49400 or 49900 research. Consult with your academic advisor for the forms used to obtain Research Mentor for each objective.
- A combination of courses and research may be used to meet this requirement.

CHEMISTRY**1. General Chemistry:**

- CHM 12901⁶ General Chemistry with a Biological Focus (5 cr.; fall)

2. Organic Chemistry Selectives: One of these two options:

- 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)
- 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)

3. Chemistry Selectives: (must choose one of the following options)

- Analytical Chemistry: BCHM 22100 Analytical Biochemistry (3 cr.; both) or CHM 32100 Analytical Chemistry I (4 cr.; fall)
- Biochemistry: BCHM 56100 General Biochemistry I (3 cr.; both) or CHM 33900⁶ Biochemistry: A Molecular Approach (3 cr.; spring) or CHM 53300 Introductory Biochemistry (3 cr.; fall)
 - Physical Chemistry: CHM 37200 Physical Chemistry (4 cr.; spring) or CHM 37300 Physical Chemistry (3 cr.; fall)

PHYSICS Selectives: One of these two options:

- PHYS 23300 Physics for Life Sciences I (4 cr.; both) and PHYS 23400 Physics for Life Sciences II (4 cr.; both)
- PHYS 17200 Modern Mechanics (4 cr.; both) and one of the following two choices:
 - PHYS 27200 Electric and Magnetic Interactions (4 cr.; both) or
 - PHYS 24100 Electricity and Optics (3 cr.; both) and PHYS 25200 Electricity and Optics Laboratory (1 cr.; spring)

PRE-PROFESSIONAL SELECTIVE (choose one⁷)

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| 1. ANTH 21200 Culture, Food & Health (3 cr.; both) | 7. PHIL 28000 Ethics & Animals (3 cr.; fall) |
| 2. ANTH 34000 Cultural Perspectives on Health (3 cr.; both) | 8. SOC 37400 The Health of Americans (3 cr.; fall) |
| 3. ANTH 35200 Drugs, Culture & Society (3 cr.; spring) | 9. SOC 57200 Comparative Healthcare Systems (3 cr.; fall) |
| 4. HK 44000 Human Diseases and Disorders (3 cr.; both) | 10. SOC 57300 Human Side of Medicine (3 cr.; fall) |
| 5. HK 44500 Epidemiology (3 cr.; both) | 11. SOC 57400 Social Organization of Healthcare (3 cr.; spring) |
| 6. PHIL 27000 Biomedical Ethics (3 cr.; spring) | 12. SOC 57600 Health and Aging in America (3 cr.; fall) |

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 7-18 credits

HLDS 3/17

¹ A 500-level BIOL course other than BIOL 54200 must be taken as part of either requirement #13 or #14.

² A course used to satisfy requirement #13 may not also count for requirement #14.

³ This course may count as a Biology Selective and as the College of Science Teambuilding and Collaboration requirement.

⁴ This course may count as a Biology Selective and as the College of Science Multidisciplinary requirement.

⁵ This course may count as a Biology Selective and as the College of Science Great Issues requirement.

⁶ Students who select 12901 for General Chemistry must take CHM 33900 and 33901. Students who end up with Special Case approval for some other Gen Chem courses may choose the other Chem Selective options. Credit is not allowed for both BIOL 44201 and CHM 33901.

⁷ This course may not be used to satisfy the College of Science General Education or Language & Culture requirements.