

University of Indianapolis - Shaheen College of Arts & Sciences

**2025-2026 Curriculum Guide for Biology Majors (BIOL)**

Bachelor of Arts or Science

**Biology Core Courses** (these must be completed for all concentration areas):

**Freshman Year - Semester I**

- BIOL 159 Introduction to Ecology and Evolution (4)
- CHEM 150 General Chemistry I (3) and **CHEM 151** General Chemistry Lab I (1)

**Freshman Year - Semester II**

- BIOL 165 Introduction to Cell Biology (4)
- CHEM 160 General Chemistry II (3) and **CHEM 161** General Chemistry Lab II (1)

**Sophomore Year**

- BIOL 225 Introduction to Genetics (4)
- BIOL 290 Biology Seminar (1)
- MATH ELEC MATH 180 or greater (MATH 190 *recommended*) (4)
- MATH ELEC (MATH 191, 220, or 245 *recommended*) (4)

**Junior and Senior Years**

- PHYS 150 General Physics I (4) or **PHYS 153** General Physics I, Calculus Based (4)
- PHYS 160 General Physics II (4) or **PHYS 163** General Physics II, Calculus Based (4)
- BIOL 495 Capstone: Integrative Biology (3) **or**
- BIOL 496 Capstone: Research Experience (1) **and**
- BIOL 490 Independent Research Project (2 hours minimum)

**Other courses required in addition to the Biology Core:**

You must choose a concentration from the following seven (7) choices:

**General Biology**

*Ideal for jobs such as lab analyst, PT/OT, state health department, hospital administration.*

**Take TWO (2) of these courses:**

- BIOL 260 Biodiversity (4)
- BIOL 265 Ecology (4)
- BIOL 280 Evolutionary Biology (4)

**Take:**

- CHEM 250 Organic Chemistry I (3) and **CHEM 251** Organic Chemistry I Lab (2)
- NAT SCI ELEC **CHEM 210** or greater, **ESCI, PHYS, SCI, or ANTH** course (min 3 hours)

**(A) Organismal Core Area (select 3 hours minimum, BIOL 260, 265, or 280 can only be counted if 2 of these have already been taken):**

- BIOL 210 Human Biological Variation (3)
- BIOL 326 Animal Development (4)
- BIOL 240 Vertebrate Anatomy (4)
- BIOL 245 Ornithology (4)
- BIOL 250 Conservation Biology (3)
- BIOL 260 Biodiversity (4)
- BIOL 265 Ecology (4)

- BIOL 377 Entomology (4)
- BIOL 280 Evolutionary Biology (4)
- BIOL 305 Human Functional Anatomy (4)
- BIOL 345 Human Evolution (3)
- BIOL 350 Plant Biology (4)
- BIOL 425 Dental Science (3)
- BIOL 450 Human Osteology (3)
- Approved course at 210-level or above (1-4)

**(B) Cell/Molecular Core Area (select 6 hours minimum):**

- BIOL 220 General Microbiology (4)
- BIOL 326 Animal Development (4)
- BIOL 266 Applied Bio Instrumentation (2)
- BIOL 310 Vertebrate Histology (4)
- BIOL 320 Biochemistry (3)
- BIOL 325 Advanced Genetics (4)
- BIOL 330 Biomedical Physiology (4)
- BIOL 331 Animal Physiology (4)
- BIOL 335 Cell Biology (4)
- BIOL 355 Biochemistry Lab (1)
- BIOL 370 Immunology (3)
- BIOL 390 Molecular Biology (4)
- BIOL 395 Biochemistry II (3)
- BIOL 435 Forensic and Historic DNA Analysis (3)
- BIOL 440 Cancer Biology (3)
- BIOL 441 Cancer Biology Lab (2)
- Approved course at 210-level or above (1-4)

**NOTES:**

- Minimum grade of C (2.0 on a 4.0 scale) required for courses applying to the Biology major and as a prerequisite for any higher level biology course.
- The biology capstone requirement may be fulfilled by taking:
  - BIOL 495 **OR**
  - BIOL 490/HONS 490: Independent Research and BIOL 496 **OR**
  - another approved research course
- No more than 6 credit hours of BIOL 490 may count toward the major.
- No single course can count for both (A) Organismal Core Area and (B) Cell/Molecular Core Area
- The Biology major requires a minimum of 65 hrs. The above courses allow the student to have a major in Biology.

**Organismal Biology Concentration [BIOB]**

*Ideal for jobs such as zoological scientist, animal behaviorist, wildlife scientist, and park ranger*

**Take the following courses:**

- BIOL 260 Biodiversity (4)
- BIOL 265 Ecology (4)
- BIOL 280 Evolutionary Biology (4)
- NAT SCI ELEC Take TWO (2) of CHEM 210 or greater, ESCI, PHYS, SCI, or ANTH courses (*min 7 hours*)

**(A) Organismal Core Area (select 10 hours minimum):**

- BIOL 326 Animal Development (4)
- BIOL 240 Vertebrate Anatomy (4)
- BIOL 245 Ornithology (4)

- **BIOL 250** Conservation Biology (3)
- **BIOL 377** Entomology (4)
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- **BIOL 331** Animal Physiology (4)
- **BIOL 350** Plant Biology (4)

**(B) Cell/Molecular Core Area (select 4 hours minimum):**

- **BIOL 220** General Microbiology (4)
- **BIOL 326** Animal Development (4)
- **BIOL 266** Applied Bio Instrumentation (2)
- **BIOL 310** Vertebrate Histology (4)
- **BIOL 325** Advanced Genetics (4)
- **BIOL 335** Cell Biology (4)
- **BIOL 370** Immunology (3)
- **BIOL 390** Molecular Biology (4)
- **BIOL 435** Forensic and Historic DNA Analysis (3)
- **BIOL 440** Cancer Biology (3)
- **BIOL 441** Cancer Biology Lab (2)

**NOTES:**

- Completion of the Biology Major (Organismal Biology Concentration) requires a minimum of 73 hours.
- No single course can count for both (A) Organismal Core Area and (B) Cell/Molecular Core Area

**Cell and Molecular Biology Concentration [CMB]**

*Ideal for jobs such as cell culture tech., microbiologist, clinical lab scientist, and OSHA specialist*

**Take the following courses:**

- **BIOL 280** Evolutionary Biology (4)
- **BIOL 335** Cell Biology (4)
- **BIOL 390** Molecular Biology (4)
- **CHEM 250** Organic Chemistry I (3) and **CHEM 251** Organic Chemistry I Lab (2)
- **CHEM 260** Organic Chemistry II (3) and **CHEM 261** Organic Chemistry I Lab (2)
- **CHEM ELEC** Take **one** course that is CHEM 210 or greater (minimum 3 hours) (*recommended: CHEM 320: Biochemistry*)

**(A) Cell/Molecular Core Area (select 8 hours minimum):**

- **BIOL 220** General Microbiology (4)
- **BIOL 326** Animal Development (4)
- **BIOL 325** Advanced Genetics (4)
- **BIOL 330** Biomedical Physiology (4)
- **BIOL 370** Immunology (3)
- **BIOL 440** Cancer Biology (3)
- **BIOL 441** Cancer Biology Lab (2)

**NOTES:**

- Completion of the Biology Major (Cell and Molecular Biology Concentration) requires a minimum of 73 hours.
- The above courses allow the student to earn a Bachelor of Science in Biology. This concentration can be used to build a second major in Chemistry with limited additional work. Consult the curriculum guide for Chemistry majors for details.

**Roche Concentration [ROCH]***Ideal for jobs such as laboratory technician, R&D scientist, instrument specialist, and biotech assistant.***Take the following courses:**

- **BIOL 220** General Microbiology (4) *Recommended sophomore year*
- **BIOL 266** Applied Bio Instrumentation (2) **OR**
- **CHEM 400** Advanced Laboratory Techniques (4)
- **CHEM 250** Organic Chemistry I (3) and **CHEM 251** Organic Chemistry I Lab (2)
- **CHEM 310** Analytical Chemistry (5)
- **PHYS 230** Laboratory Instrumentation I (3)

**(A) Roche Core Area (select 14 hours minimum):**

- **BIOL 310** Vertebrate Histology (4)
- **BIOL 330** Biomedical Physiology (4) **OR**
- **BIOL 331** Animal Physiology (4)
- **BIOL 335** Cell Biology (4)
- **BIOL 370** Immunology (3)
- **BIOL 390** Molecular Biology (4)

**NOTES:**

- Completion of the Biology Major (Roche Concentration) requires a minimum of 73 hours.
- Students may not take both BIOL 330 and 331 to count toward the Roche Core Area minimum hours.

**Pre-Dental Concentration [DENT]***Ideal for dental school preparation.***Take the following course:**

- **BIOL 220** General Microbiology (4) *Recommended sophomore year*

**Take TWO (2) of the following courses:**

- **BIOL 260** Biodiversity (4)
- **BIOL 265** Ecology (4)
- **BIOL 280** Evolutionary Biology (4)

**Take the following courses:**

- **CHEM 250** Organic Chemistry I (3) and **CHEM 251** Organic Chemistry I Lab (2)
- **CHEM 260** Organic Chemistry II (3) and **CHEM 261** Organic Chemistry I Lab (2)
- **CHEM 320** Biochemistry (3)

**Pre-Dental Core Area (select 9 hours minimum):**

- **ANTH 425** Dental Science (3)
- **BIOL 210** Human Biological Variation (3)
- **BIOL 305** Human Functional Anatomy (4)
- **BIOL 310** Vertebrate Histology (4)
- **BIOL 325** Advanced Genetics (4)
- **BIOL 330** Biomedical Physiology (4) **OR**
- **BIOL 331** Animal Physiology (4)
- **BIOL 335** Cell Biology (4)
- **BIOL 370** Immunology (3)
- **BIOL 395** Biochemistry II (3)

**NOTES:**

- Completion of the Biology Major (Pre-Dental Concentration) requires a minimum of 74 hours.
- Students may not take both BIOL 330 and 331 to count toward the Pre-Dental Core Area minimum hours.

**Pre-Medical Concentration [MED]***Ideal for medical school preparation.***Take the following courses:**

- **BIOL ELEC** Take ONE (1) course in BIOL 210 or greater excluding BIOL 225 (minimum 3 hours)
- **PSY ELEC** Take ONE (1) course in PSY 210 or greater (minimum 3 hours) *Recommended: PSY 230: Brain & Behavior*

**Take TWO (2) of the following courses:**

- **BIOL 260** Biodiversity (4)
- **BIOL 265** Ecology (4)
- **BIOL 280** Evolutionary Biology (4)

**Take the following courses:**

- **CHEM 250** Organic Chemistry I (3) and **CHEM 251** Organic Chemistry I Lab (2)
- **CHEM 260** Organic Chemistry II (3) and **CHEM 261** Organic Chemistry I Lab (2)
- **CHEM 320** Biochemistry (3)

**Pre-Medical Core Area (select 6 hours minimum):**

- **BIOL 210** Human Biological Variation (3)
- **BIOL 220** General Microbiology (4)
- **BIOL 305** Human Functional Anatomy (4)
- **BIOL 310** Vertebrate Histology (4)
- **BIOL 325** Advanced Genetics (4)
- **BIOL 330** Biomedical Physiology (4) **OR**
- **BIOL 331** Animal Physiology (4)
- **BIOL 335** Cell Biology (4)
- **BIOL 370** Immunology (3)
- **BIOL 395** Biochemistry II (3)

**NOTES:**

- Completion of the Biology Major (Pre-Medical Concentration) requires a minimum of 73 hours.
- Students may not take both BIOL 330 and 331 to count toward the Pre-Medical Core Area minimum hours.

**Pre-Veterinary Concentration [VET]***Ideal for medical school preparation.***Take TWO (2) of the following courses:**

- **BIOL 260** Biodiversity (4)
- **BIOL 265** Ecology (4)
- **BIOL 280** Evolutionary Biology (4)

**Take the following courses:**

- **BIOL ELEC** Take ONE (1) course in BIOL 210 or greater excluding BIOL 225 (minimum 3 hours)
- **CHEM ELEC** Take ONE (1) course in CHEM 210 or greater (minimum 3 hours)
- **CHEM 250** Organic Chemistry I (3) and **CHEM 251** Organic Chemistry I Lab (2)
- **CHEM 260** Organic Chemistry II (3) and **CHEM 261** Organic Chemistry I Lab (2)
- **PSY ELEC** Take ONE (1) course in PSY 210 or greater (minimum 3 hours) *Recommended: PSY 230: Brain & Behavior*

**Pre-Veterinary Core Area (select 6 hours minimum):**

- **BIOL 210** Human Biological Variation (3)
- **BIOL 220** General Microbiology (4)
- **BIOL 240** Comparative Vertebrate Anatomy (4)
- **BIOL 310** Vertebrate Histology (4)
- **BIOL 325** Advanced Genetics (4)
- **BIOL 330** Biomedical Physiology (4) **OR**

- **BIOL 331** Animal Physiology (recommended) (4)
- **BIOL 335** Cell Biology (4)
- **BIOL 370** Immunology (3)

**NOTES:**

- Completion of the Biology Major (Pre-Veterinary Concentration) requires a minimum of 73 hours.
- Students may not take both BIOL 330 and 331 to count toward the Pre-Medical Core Area minimum hours.
- Many veterinary professional programs require an animal nutrition course, a course not yet offered at UIIndy. Be sure to check the requirements of your preferred veterinary program prior to selecting courses.

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**ADDITIONAL NOTES:**

- The Bachelor's Degree requires a minimum of 120 hrs. See the General Education Core Guide for additional requirements.
- Many biology elective courses are offered every other year.
- **Early admission to professional programs:** Biology majors planning to apply to a professional program (e.g., medical, dental, optometry, veterinary, physical therapy, or occupational therapy) may be eligible for admission to such a program after their junior year if (1) all general education core requirements are met, and (2) a minimum of 90 undergraduate semester hours are completed, and (3) all major courses except the chemistry elective and 5 hours of biology electives have been satisfied.
- A student may complete more than one major as long as each major has at least 24 discrete hours. Please see the Academic Catalog for additional details.
- Below are recommended electives for pre-professional program students:
  - **Pre-Physical Therapy/Pre-Occupational Therapy**
    - **BIOL 305** Human Functional Anatomy (4) **OR**
    - **BIOL 240** Vertebrate Anatomy (4)
    - **BIOL 330** Biomedical Physiology (4)

**REMEMBER:** If you have any questions about the Biology Major and its requirements contact the Department Chair, Dr. Sandra Davis (317-788-2400) or the academic advisor for the Biology department.