

Biology

Major

Minor

Pre-health Professions Option

	For Major	For Minor	Pre-Health Prof. Option	Biotech. Concen.	Env. Science Concen.	Teaching Cert. Option
Hours Required in Biology:	40	24	40	43-44	42	40-41
Hours Required in Other Depts.:	30	0	30	39-40	43	74.5
Total Hours Required:	70	24	70	82-84	85	114.5-115.5

Concentrations in

- BIOTECHNOLOGY
- ENVIRONMENTAL SCIENCE

Teaching Certification Option

See related programs:

- ENVIRONMENTAL ANALYSIS & PLANNING
- ETHNOBOTANY
- FORESTRY
- INTERPRETIVE BIOLOGY & NATURAL HISTORY
- WILDLIFE & FISHERIES

Professors:

Raesly (Chair), Seddon, Serfass

Associate Professors:

Ammer, Fritz, Li, Pegg

Assistant Professors:

Brosi, Fiscus, Keller, Lambert, Puthoff, Robertson-Thompson

- You may elect the teaching certification option (internship required). Select the biology major without concentration to meet certification requirements.

Summary of Requirements for Major/Minor in Biology

Major	Minor
<p>1. Introductory Level Courses: (8 hours) BIOL 149 General Biology I (GEP Group C) BIOL 150 General Biology II</p> <p>2. Advanced Level Courses: (16 hours) BIOL 304 Microbiology BIOL 310 Cell Biology BIOL 340 General Ecology BIOL 350 Genetics BIOL 496 Seminar in Biology (Capstone)</p> <p>3. Distribution Within Department: (16 hours) <i>Total of 4 courses in 3 groups; at least 1 in each group:</i></p> <p>Group I BIOL 302 Animal Physiology BIOL 303 Plant Physiology</p> <p>Group II BIOL 411 Invertebrate Zoology Either BIOL 427 Comparative Anatomy or BIOL 426 Vertebrate Zoology</p> <p>Group III BIOL 311 Morphology of Fungi and Non-Vascular Plants BIOL 312 Morphology of Vascular Plants</p> <p>4. Elective Hours in Department: (0 hours)</p> <p>5. Required Courses in Other Departments:</p> <p>Chemistry: (16 hours) CHEM 201, 202 General Chemistry (CHEM 201-GEP Group C) CHEM 301, 302 Organic Chemistry</p> <p>Mathematics: (6 hours) MATH 209 Elements of Applied Probability & Statistics (Core Skill 3) or MATH 219 Honors: Elements of Applied Probability & Statistics (Core Skill 3)</p> <p><i>Select one from:</i> MATH 102 College Algebra (Core Skill 3) MATH 103 Trigonometry MATH 120 Pre-Calculus Mathematics (Core Skill 3) or any course above 210</p> <p>Physics: (8 hours) PHYS 215, 216 General Physics I and II (PHYS 215-GEP Group C) or PHYS 261, 262 Principles of Physics I and II (PHYS 261-GEP Group C)</p>	<p>1. Introductory Level Courses: (8 hours) BIOL 149 General Biology I (GEP Group C) BIOL 150 General Biology II</p> <p>4. Elective Hours in Department: (16 hours) <i>Select from biology courses at the 200 level or higher.</i></p>

BIOLOGY

- Biology is often selected as a major by students planning to enter medicine and other health professions careers. If you plan advanced study in the health professions, you should choose the pre-health professions option.
- If you are a pre-physical therapy or pre-occupational therapy student, you should consult individual allied health program listings for specific program requirements. If you are interested in pursuing graduate studies in other areas of Biology, you should not choose this option.

Pre-Health Professions Option for Biology Majors*(Pre-Dental, Pre-Medical, Pre-Optometry and Pre-Veterinary)***1. Introductory Level Courses: (8 hours)**

BIOL 149 General Biology I (*GEP Group C*)
 BIOL 150 General Biology II

2. Advanced Level Courses: (28 hours)

BIOL 302 Animal Physiology*
 BIOL 304 Microbiology
 BIOL 310 Cell Biology
 BIOL 311 Morphology of Fungi and Non-Vascular Plants
 or BIOL 312 Morphology of Vascular Plants
 BIOL 340 General Ecology
 BIOL 350 Genetics
 BIOL 427 Comparative Anatomy*
 BIOL 496 Seminar in Biology (*Capstone*)

3. Elective Hours in Biology Department: (4 hours)*Choose one course:*

BIOL 404 Histology
 BIOL 412 General Parasitology
 BIOL 435 Molecular Biology
 BIOL 440 Developmental Biology

**Only students interested in a career in Physical Therapy or Occupational Therapy should take BIOL 321 (Anatomy and Physiology I) and BIOL 322 (Anatomy and Physiology II) in place of BIOL 302 (Animal Physiology) and BIOL 427 (Comparative Anatomy). All other program requirements are the same as for the Pre-Health Professions Option for Biology Majors.*

4. Required Advanced Courses in Other Departments: (30 hours)*Same as major. See #5 above.*

- The biotechnology concentration in biology offers you an interdisciplinary program with a strong emphasis on laboratory experiences in biology and chemistry, while maintaining a strong biology core. The option is best suited for students who wish to pursue an advanced degree in cell or molecular biology or to find employment in the biotechnology industry.

Summary of Requirements for Major in Biology - Biotechnology Concentration**1. Introductory Level Courses: (8 hours)**

BIOL 149 General Biology I (*GEP Group C*)
 BIOL 150 General Biology II

2. Advanced Level Courses: (15 hours)

BIOL 304 Microbiology
 BIOL 310 Cell Biology
 BIOL 340 General Ecology
 BIOL 350 Genetics

3. Biotechnology Option: (17 hours)

BIOL 401 Genetics Lab
 BIOL 435 Molecular Biology
 BIOL 437 Molecular Biology Seminar (*Capstone*)
 BIOL 438 Biotechnology Laboratory (3 hours)
 BIOL 440 Developmental Biology
 BIOL 445 Immunology

4. Select one from: (3-4 hours)

BIOL 302 Animal Physiology
 BIOL 303 Plant Physiology
 BIOL 404 Histology
 BIOL 436 Electron Microscopy
 BIOL 499 Special Problems in Biology
 or IDIS 493 Honors Thesis

5. Required Courses in Other Departments:**Chemistry: (25 hours)**

CHEM 201 General Chemistry I (*GEP Group C*)
 CHEM 202 General Chemistry II
 CHEM 301 Organic Chemistry I
 CHEM 302 Organic Chemistry II
 CHEM 455 Biochemistry I
 CHEM 456 Biochemistry Lab
 CHEM 457 Biochemistry II

Mathematics: (6-7 hours)

MATH 209 Elements of Applied Probability & Statistics (*Core Skill 3*)
 or Math 219 Honors: Elements of Applied Probability & Statistics (*Core Skill 3*)

Select one from:

MATH 220 Calculus for Applications I
 MATH 236 Calculus I (*Core Skill 3*)

Physics: (8 hours)

PHYS 215, 216 General Physics I and II
 (*PHYS 215 - GEP Group C*)
 or PHYS 261, 262 Principles of Physics I and II
 (*PHYS 261 - GEP Group C*)

- For students interested in the stewardship of natural resources with a greater emphasis on economic and political perspectives.
- This concentration allows you to choose electives in economics, political science and the humanities which potentially add a thematic direction to your degree.
- You should not choose this concentration if you are in pre-health professions or planning to attend a traditional biology graduate program.

Summary of Requirements for Major in Biology - Environmental Science Concentration

1. Introductory Level Courses: (18 hours)

BIOL 149 General Biology I (GEP Group C)
 BIOL 150 General Biology II
 ECON 201/211* Macroeconomics (GEP Group D)
 GEOG 103/113* Physical Geography (GEP Group C)
 POSC 110/112* Introduction to American Politics (GEP Group D)
 or POSC 113/114* Introduction to World Politics (GEP Group D)
 or POSC 131 Introduction to Comparative Politics (GEP Group D or F)

(Check the prerequisites for other POSC courses before choosing your introductory POSC course)

2. Advanced Level Courses: (40 hours)

BIOL 200 Scientific Investigation and Communication
 BIOL 304 Microbiology
 BIOL 310 Cell Biology
 BIOL 340 General Ecology
 BIOL 350 Genetics
 BIOL 406 Ornithology
 or BIOL 423 Mammalogy
 or BIOL 426 Vertebrate Zoology
 BIOL 425 Forest Ecology and Conservation
 BIOL 450 Ecology and Management of Wildlife Populations
 or BIOL 420 Fish Management and Culture
 GEOG 473 Environmental Law
 ECON 202 Microeconomics
 BIOL 494 Field Experiences in Biological Sciences (Capstone - 6 credits)

3. Required Supporting Courses: (18 hours)

CHEM 201 General Chemistry I (GEP Group C)
 CHEM 202 General Chemistry II
 CHEM 420 Environmental Chemical Analysis
 MATH 209/219* Elements of Applied Probability & Statistics (Core Skill 3)
 MATH 102 College Algebra (Core Skill 3)
 or MATH 103 Trigonometry
 or MATH 120 Pre-Calculus Mathematics (Core Skill 3)
 or any MATH course above 210

4. Electives: (9 hours)

Select at least three courses listed below. At least one course must be taken from each group.

Group I Advanced Economics

ECON 309 Comparative Economic Systems
 ECON 405 Economic Growth and Development: The Developing Economies

Group II Advanced Political Science

POSC 330 Politics of Africa
 POSC 331 Politics of Latin America
 POSC 332 Politics of the Middle East
 POSC 450 Environmental Public Policy
 GEOG 407 Political Geography

Group III Advanced Humanities

ENGL 440 Literature of the Environment
 HIST 409 World Environmental History
 PHIL 315 Philosophy and the Environment

Summary of Requirements for Teaching Certification Option in Biology

If you wish to complete a Maryland State approved program in teaching Biology, you must:

- Complete the BA/BS in Biology (without concentration).
- Meet the phase admissions requirements summarized in the Educational Professions section.
- Complete the professional education sequence described in Education: Secondary School Programs.