Biology

Major

Concentrations in
• MOLECULAR BIOLOGY
• ENVIRONMENTAL SCIENCE

Option in
• PRE-HEALTH PROFESSIONS

Minor

See related programs:
• ETHNobotany
• Forestry
• INTERPRETIVE BIOLOGY & NATURAL HISTORY
• WILDLIFE & FISHERIES

Contact:
Thomas Serfass, Professor, Department of Biology

Professors:
Ammer, Fritz, Raesly, Seddon, Serfass (Chair)

Associate Professors:
Brosi, Keller, H. Li, Pegg, Puthoff

Assistant Professors:
Lambert, Studinski, Taylor, Vrentas

Summary of Requirements for Major/Minor in Biology

<table>
<thead>
<tr>
<th>For Major</th>
<th>For Minor</th>
<th>Pre-Health Prof. Option</th>
<th>Mol. Bio Concen.</th>
<th>Env. Science Concen.</th>
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</thead>
<tbody>
<tr>
<td>Hours Required in Biology:</td>
<td>40-43</td>
<td>21-24</td>
<td>42-44</td>
<td>46-48</td>
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<tr>
<td>Hours Required in Other Depts.:</td>
<td></td>
<td>30</td>
<td>0</td>
<td>30</td>
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<tr>
<td>Total Hours Required:</td>
<td>70-73</td>
<td>21-24</td>
<td>72-74</td>
<td>85-87</td>
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1. Introductory Level Courses: (12 hours)
   - BIOL 149 General Biology I (GEP Group C)
   - BIOL 160 General Zoology
   - BIOL 161 General Botany

2. Advanced Level Courses: (19 hours)
   - BIOL 304 Microbiology
   - BIOL 310 Cell Biology
   - BIOL 340 General Ecology
   - BIOL 350 Genetics
   - BIOL 402 Evolution
   - BIOL 496 Seminar in Biology (Capstone)

3. Biology Electives: (9-12 hours)
   Select any 3 classes between the 300 and 455 level.

4. Required Courses in Other Departments: (30 hours)
   **Chemistry:**
   - CHEM 201 and 202 General Chemistry I & II (CHEM 201 - GEP Group C)
   - CHEM 311 and 312 Organic Chemistry I
   - CHEM 321 and 322 Organic Chemistry II

   **Mathematics:**
   - MATH 109 / 110 Elements of Applied Probability & Statistics (Core Skill 3)
   - Select one from:
   - MATH 119 College Algebra
   - MATH 120 Pre-Calculus Mathematics (Core Skill 3)
   - or any course above 210

   **Physics:**
   - PHYS 215 and 216 General Physics I & II (PHYS 215 - GEP Group C)
   - or PHYS 261 and 262 Principles of Physics I & II (PHYS 261 - GEP Group C)
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 unrelated to the health fields, you should NOT choose this option.

Pre-Health Professions Option for Biology Majors
(Pre-Dental, Pre-Medical, Pre-Optometry, Pre-Veterinary, Allied Health Fields)

1. Introductory Level Courses: (12 hours)
   - BIOL 149 General Biology I (GEP Group C)
   - BIOL 160 General Zoology
   - BIOL 161 General Botany

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)

3. Advanced Level Classes in Biology (8 hours)
   - BIOL 321 Anatomy and Physiology I
   - BIOL 322 Anatomy and Physiology II
   - or
   - BIOL 302 Animal Physiology
   - BIOL 427 Comparative Anatomy

4. Electives: (6-8 hours)
   Choose two of the following:
   - BIOL 402 Evolution
   - BIOL 404 Histology
   - BIOL 412 General Parasitology
   - BIOL 435 Molecular Biology
   - BIOL 440 Developmental Biology
   - BIOL 445 Immunology
   - BIOL 456 Advanced Microscopy
   - CHEM 455 Biochemistry I

5. Required Courses in Other Departments: (30 hours)
   See Section 4 above (Biology major).

Summary of Requirements for Major in Biology – Molecular Biology Concentration

1. Introductory Level Courses: (12 hours)
   - BIOL 149 General Biology I (GEP Group C)
   - BIOL 160 General Zoology
   - BIOL 161 General Botany

2. Advanced Level Courses: (11 hours)
   - BIOL 304 Microbiology
   - BIOL 310 Cell Biology
   - BIOL 350 Genetics

3. Molecular Biology 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. Electives: (6-8 hours)
   Choose two of the following:
   - BIOL 302 Animal Physiology
   - BIOL 303 Plant Physiology
   - BIOL 340 General Ecology
   - BIOL 402 Evolution
   - BIOL 404 Histology
   - BIOL 456 Advanced Microscopy
   - BIOL 499 Special Problems in Biology
   - or IDIS 493 Honors Thesis

5. Required Courses in Other Departments: (39 hours)
   Chemistry:
   - CHEM 201 and 202 General Chemistry (CHEM 201 – GEP Group C)
   - CHEM 311 and 312 Organic Chemistry I
   - CHEM 321 and 322 Organic Chemistry II
   - CHEM 455, 457 and 456 Biochemistry I, II and Biochemistry Lab

   Mathematics:
   - MATH 109/110 Elements of Applied Probability & Statistics
     (Core Skill 3)
   - and select one from:
     - MATH 220 Calculus for Applications I
     - MATH 236 Calculus I (Core Skill 3)

   Physics: (8 hours)
   - PHYS 215 and 216 General Physics I & II (PHYS 215 – GEP Group C)
   - or PHYS 261 and 262 Principles of Physics I & II (PHYS 261 – GEP Group C)
Summary of Requirements for Major in Biology – Environmental Science Concentration

1. Introductory Level Courses: (22 hours)
   - BIOL 149 General Biology I (GEP Group C)
   - BIOL 160 General Zoology
   - BIOL 161 General Botany
   - ECON 201/211 Macroeconomics (GEP Group D)
   - GEOG 103/113 Physical Geography (GEP Group C)
   - POCS 110/112* Introduction to American Politics (GEP Group D)
     or POCS 113/114 Introduction to World Politics (GEP Group D)
     or POCS 131** Introduction to Comparative Politics (GEP Group D or F)

2. Advanced Level Courses: (24 hours)
   - BIOL 304 Microbiology
   - BIOL 310 Cell Biology
   - BIOL 340 General Ecology
   - BIOL 350 Genetics
   - BIOL 402 Evolution
   - BIOL 494 Field Experiences in Biological Sciences (Capstone - 6 credits)

3. Supporting Courses: (16 hours)
   - BIOL 406 Ornithology
   - or BIOL 423 Mammalogy
   - or BIOL 425 Vertebrate Zoology
   - BIOL 450 Ecology and Management of Wildlife Populations
     or BIOL 420 Fish Management and Culture
   - ECON 202 Microeconomics
   - GEOG 473 Environmental Law

Check the prerequisites for other POCS courses before choosing your introductory POCS course.
* POCS 131 preferred prerequisite for POCS 330, 331, 332.
** POCS 110/112 required prerequisite for POCS 450

4. Courses in Other Departments (18 hours)
   - Chemistry:
     - CHEM 201 and 202 General Chemistry (CHEM 201 – GEP Group C)
     - CHEM 420 Environmental Chemical Analysis
   - Mathematics:
     - MATH 109/110 Elements of Applied Probability and Statistics (Core Skill 3)
     - Select one from:
       - MATH 119 College Algebra
       - MATH 103 Trigonometry
       - MATH 120 Pre-Calculus Mathematics (Core skill 3)
       - or any course above 210

5. Electives: (6 hours)
   - Select two courses from different groups.

Group I Advanced Economics
   - ECON 309 Comparative Economic Systems
   - ECON 405 Economic Growth and Development: The Developing Economies
   - ECON 410 Resource and Energy Economics

Group II Advanced Political Science
   - GEOG 407 Political Geography
   - POCS 330 Politics of Africa
   - POCS 331 Politics of Latin America
   - POCS 332 Politics of the Middle East
   - POCS 450 Environmental Public Policy

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 Double Major in Secondary Teacher Education

If you wish to complete a Maryland State-approved program in teaching secondary science, you must:
- Complete the BA/BS in Biology in any concentration.
- Declare a second major in Secondary Teacher Education. See the Secondary Teacher Education Program Coordinator for details.
- In addition to the regular major requirements, you must take coursework in chemistry, physics, and earth science in order to qualify for Maryland State certification in science and to meet NCATE accreditation standards. See the Secondary Teacher Education Program Coordinator for details.