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

	For Major	For Minor	Pre-Health Prof. Option	Mol. Bio Concen.	Env. Science Concen.
Hours Required in Biology:	40-43	21-24	42-44	46-48	46
Hours Required in Other Depts.:	30	0	30	39	40
Total Hours Required:	**70-73**	**21-24**	**72-74**	**85-87**	**86**

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

Major

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)

Minor

1. Introductory Level Courses: *(12 hours)*

BIOL 149 General Biology I *(GEP Group C)*
BIOL 160 General Zoology
BIOL 161 General Botany

2. Elective Hours Within Department: *(9-12 hours)*

Select any 3 biology courses between the 300 and 455 level.

- 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).

- The molecular biology concentration offers 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 – 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)*

- 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: *(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)*
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)*

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 426 Vertebrate Zoology
BIOL 425 Forest Ecology and Conservation
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 POSC courses before choosing your introductory POSC course.
** POSC 131 preferred prerequisite for POSC 330, 331, 332.*
*** POSC 110/112 required prerequisite for POSC 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
POSC 330 Politics of Africa
POSC 331 Politics of Latin America
POSC 332 Politics of the Middle East
POSC 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.