

Ecology and Evolution Major

www.biology.pitt.edu

Revised: 04/2016

The field of Ecology explores the interactive web of organisms and the environment. Studies in evolution consider the processes by which modern organisms have developed from ancestral ones. The Ecology and Evolution major is a good choice for students interested in the fundamental questions of the evolutionary origins of organisms and how they survive, or don't survive, in their changing habitats. Within this major, students have the opportunity for in-depth study of the morphological and physiological adaptations of a variety of animals, plants, and microorganisms to a changing world, the ecological relationships of organisms from the individual to the global scale, and the mechanisms that drive evolutionary change.

Employment opportunities in Ecology and Evolutionary Biology have increased greatly in recent years. There continues to be a demand for well-trained professionals at all levels (BS, MS, and PhD). Government environmental agencies, commercial consulting and testing firms, waste management industries, research laboratories, and natural history and science museums are just a few of the career opportunities. Graduate departments of ecology, evolution, environmental sciences, genetics, botany, public policy, and public health are actively seeking well-qualified students. The required chemistry, physics, and mathematics courses incorporate the requirements for admission to medical, dental, and other health-professional schools. An Ecology and Evolution major could also serve as a springboard to a career in law.

Required courses for the Ecology and Evolution Major

Biological Science Courses

BIOSC 0150 Foundations of Biology 1
BIOSC 0050 Foundations of Biology Lab 1
BIOSC 0160 Foundations of Biology 2
BIOSC 0060 Foundations of Biology Lab 2
BIOSC 0350 Genetics
BIOSC 0370 Ecology
BIOSC 0390 Ecology Lab
BIOSC 1000 Biochemistry
BIOSC 1130 Evolution
BIOSC 1320 Population Biology
BIOSC 1550 Ecology and Evolution Seminar
BIOSC 0391 **or** 1551 (Writ)
Pymatuning course

Chemistry courses

CHEM 0110 General Chemistry 1
CHEM 0120 General Chemistry 2
CHEM 0310 Organic Chemistry 1
CHEM 0320 Organic Chemistry 2
CHEM 0345 Organic Chemistry Lab

Mathematics courses

MATH 0220 Analytic Geometry and Calculus 1
MATH 0230 Analytic Geometry and Calculus 2 **or**
STAT 1000 Applied Statistical Methods

Physics courses

PHYS 0110, 0111 Introduction to Physics 1, 2 **or**
PHYS 0174, 0175 Basic Physics for Sci. & Engineering 1, 2

Note: While not required for the major, PHYS 0212 Introduction to Laboratory Physics and PHYS 0219 Basic Laboratory Physics for Science & Engineering are useful for graduate study in certain sciences and is required for admission to many medical and dental schools.

Elective courses

Six credits, which must include at least one (1) Field Course (3-credit minimum) from **Section (a)** taken at the Pymatuning Laboratory of Ecology (PLE) **or** an equivalent site approved in writing by the Director of Undergraduate Programs in the Biological Sciences Department **and** the Director of PLE.

a) BIOSC 0740, 1040, 1140, 1160, 1170, 1180, 1190, 1220, 1230, 1260, 1270, 1300, 1310, 1330, 1340, 1360, 1390, 1410, 1420, 1430, 1600, 1610.

b) The remaining credits may also come from **Section (a)** **or** from other BIOSC courses above 1000 (BIOSC 1690, 1901, 1903, 1904 do **not** count toward these units); **or** from ANTH 1601, 1602, 1603, 1605, 1606, 1607, 1609, 1611, 1615, 1618; NROSCI 1000, 1012, 1017.

Note: Any University Honors College (UHC) equivalents to required courses or elective courses are also acceptable.

Course requirements

Higher Level course requirement

Students who declared after September 14, 2009 **MUST** take one higher level BIOSC elective course as part of their 15 credits of BIOSC electives. The higher level course is automatically satisfied in this major by BIOSC 1130 and 1320.

Lab requirement: Students must complete at least two BIOSC labs for the major and at least one of them must be taken at the Pittsburgh Campus. BIOSC labs are satisfied in this major by BIOSC 0390 and a Pymatuning course.

Writing (W) requirement: Students must complete at least one W-course in the major.

Grade requirements

BIOSC courses: Each required BIOSC course for the major must be completed with a grade of C or better. The elective courses for the major must also be completed with a grade of C or better. A minimum GPA of 2.0 in all departmental courses taken is required for graduation. If a C- or lower is earned in an elective course for the major but is not repeated, the course will be used to calculate the departmental GPA, but will not be counted toward the 32 credits required for the major.

Co-Requisite courses: Students must also earn a minimum GPA of 2.0 in the co-requisite Chemistry, Mathematics, and Physics courses. A passing grade of C- or lower in a co-requisite course can be accepted, **except** for CHEM 0110 and CHEM 0120, if balanced by a higher grade in another co-requisite course so that the co-requisite GPA is 2.0 or higher. Students **must** pass CHEM 0110 and CHEM 0120 with a grade of **C** (not C-) or better for the major.

Related area: Chemistry satisfies the related area requirement for the Ecology and Evolution major and the chemistry minor as long as half of the chemistry credits are from the University of Pittsburgh.

Satisfactory/Audit option: One BIOSC course may be taken on an S/NC basis.

Advising: The Biological Sciences Departmental Advisors are available to discuss the major and answer your questions. You are welcome and encouraged to stop by the Biological Sciences Advising Office, A258 Langley Hall, to peruse the handouts or meet with an advisor even before declaring a major. They love visitors! After declaring a major in Biological Sciences, students will officially be advised by and register for classes with the Biological Sciences Advising Office.

Advisors

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Declaring the major: Before students officially declare the Ecology and Evolution major, they must have completed BIOSC 0150, 0160 and CHEM 0110, 0120 with a grade of C (not C-) or better. Transfer students who have finished these requirements prior to admission to the University of Pittsburgh are asked to complete one term of course work, including at least one BIOSC course that counts toward the major, before declaring.

Other Biological Sciences major options

Bioinformatics
Biological Sciences
Microbiology
Molecular Biology

Checklist for the Ecology and Evolution major

Biological Science courses

_____ BIOSC 0150 **or** 0715 (UHC) **or** BIOSC 0190
_____ BIOSC 0050 **or** 0057
_____ BIOSC 0160 **or** BIOSC 0716 (UHC) **or** BIOSC 0191
_____ BIOSC 0060 **or** 0067
_____ BIOSC 0350 **or** BIOSC 0355 (UHC)
_____ BIOSC 0370
_____ BIOSC 0390
_____ BIOSC 1000 **or** 1810 **and** 1820
_____ BIOSC 1130
_____ BIOSC 1320
_____ BIOSC 1550
_____ BIOSC 0391 **or** 1551 (Writ)

Chemistry courses

_____ CHEM 0110 **or** 0710 (UHC)
_____ CHEM 0120 **or** 0720 (UHC)
_____ CHEM 0310 **or** 0730 (UHC)
_____ CHEM 0320 **or** 0740 (UHC)
_____ CHEM 0345

Mathematics courses

_____ MATH 0220
_____ MATH 0230 **or** 0235 **or** STAT 1000

Physics courses

_____ PHYS 0110 **or** 0174 **or** 0475
_____ PHYS 0111 **or** 0175 **or** 0476

Elective courses (6 credits)

_____ BIOSC _____ (Pymatuning Field Course)
_____ BIOSC _____

Note: Students may use one of the following courses to satisfy their non-field course elective.

Anthropology

ANTH 1601 Structure and Function
ANTH 1602 Human Skeletal Analysis
ANTH 1603 Human Origins
ANTH 1605 Primate Anatomy
ANTH 1606 Fossils and Living Primates
ANTH 1607 Primate Behavior
ANTH 1609 Advanced Skeletal Analysis
ANTH 1611 Evolutionary Theory
ANTH 1615 Evolution of the Vertebrates
ANTH 1618 Special Topics in Sociobiology

Neuroscience

NROSCI 1000 Introduction to Neuroscience
NROSCI 1012 Neurophysiology
NROSCI 1017 Synaptic Transmission