

Microbiology Major

www.biology.pitt.edu

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Microbiology is the study of microscopic organisms, including viruses, bacteria, archaea, fungi, and protists. Microorganisms are important for both the good that they do (nutrient cycling, production of antibiotics, bioremediation, food production) and the bad (food poisoning, infectious diseases, epidemics). Our program provides intensive training in modern microbiology, including cutting-edge research in genomics and genetic engineering.

Microbiologists pursue careers in many fields, including agricultural, environmental, food, and industrial microbiology; public health; resource management; basic research; education; and pharmaceuticals. Jobs in all of these fields are available at the BS level as well as the MS and PhD levels. The microbiology major also incorporates the requirements expected for admission to medical, dental, and other health professional schools, and to graduate schools in microbiology, molecular biology, biochemistry, and related disciplines.

Required courses for the Microbiology 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 **or** BIOC 1130 Evolution
BIOSC 1000 Biochemistry*
BIOSC 1570 Microbiology Seminar
BIOSC 1850 Microbiology
BIOSC 1860 Microbiology Laboratory
BIOSC 1865 Microbial Physiology
BIOSC 1291 **or** 1571 **or** 1741 **or** 1861 (Writ)

* Students may choose the alternate sequence BIOC 1810 Macromolecular Structure and Function and 1820 Metabolic Pathways in lieu of BIOC 1000. In this case, students take four BIOC elective credits rather than seven as specified.

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

One of the following

MATH 0230 Analytic Geometry and Calculus 2
STAT 1000 Applied Statistical Methods

Physics courses

Choose one of the following pairs

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

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

Elective courses

Seven BIOSC credits, including at least one lab or field course, from the following lists.

Lecture courses

BIOSC 1280 Microbial Genetic Engineering
BIOSC 1500 Cell Biology
BIOSC 1540 Computational Biology
BIOSC 1730 Virology
BIOSC 1760 Immunology
BIOSC 1820 Metabolic Pathways (with 1810)
BIOSC 1940 Molecular Biology
BIOSC 1999 Medical Microbiology

Lab courses

BIOSC 0390 Ecology Lab
BIOSC 1285 Genomics Lab
BIOSC 1290 Experimental Genetic Engineering
BIOSC 1510 Cell Biology Lab
BIOSC 1740 Virology Lab
BIOSC 1950 Molecular Genetics Lab

Field courses

BIOSC 1260 Aquatic Botany
BIOSC 1360 Microbial Ecology

Note: Any University Honors College (UHC) equivalents to required courses or elective courses are 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 BIOSC electives. The higher level course is automatically satisfied in this major by BIOSC 1865.

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 1860 and BIOSC 0390, 1260, 1285, 1290, 1360, 1510, 1740, or 1950.

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.

Satisfactory/No Credit option: One BIOSC course can be taken on an S/NC basis.

Related area: The chemistry requirements satisfy the related area requirement for the Microbiology major and the Chemistry minor as long as half of the chemistry credits are from the University of Pittsburgh.

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 the Biological Sciences Advising Office.

Advisors

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Declaring the Major: Before students officially declare the Microbiology 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	Ecology and Evolution
Biological Sciences	Molecular Biology

Information about these majors is available in the Biological Sciences Advising Office.

Checklist for the Microbiology major

Biological Science courses

_____ BIOSC 0150 **or** BIOSC 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 **or** BIOSC 1130
_____ BIOSC 1000 **or** BIOSC 1810/1820
_____ BIOSC 1570
_____ BIOSC 1850
_____ BIOSC 1860
_____ BIOSC 1865
_____ BIOSC 1291 **or** 1571 **or** 1741 **or** 1861 (Writ)

Elective courses

_____ BIOSC _____
_____ BIOSC _____
_____ BIOSC _____ lab or field course

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

One of the following

_____ MATH 0230
_____ STAT 1000

Physics courses

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