



Microbiology Major

www.Biology.Pitt.edu

Revised: 07/2024

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 005X Foundations of Biology Lab 1
BIOSC 0160 Foundations of Biology 2
BIOSC 006X Foundations of Biology Lab 2
BIOSC 0350 Genetics
BIOSC 1000 Biochemistry*
BIOSC 1570 Microbiology Seminar
BIOSC 1850 Microbiology
BIOSC 1860 Microbiology Laboratory
BIOSC 1865 Microbial Physiology
BIOSC 1280 Microbial Genetics

*Note: Students may alternately choose BIOSC 1810 (Macromolecular Structure and Function) **and** 1820 (Metabolic Pathways) in lieu of BIOSC 1000. In this case, students take four elective credits rather than seven as specified in *elective courses*.

One of the following writing-intensive courses

BIOSC 1571 Microbiology Seminar Writing Practicum
BIOSC 1741 Virology Lab Writing Practicum
BIOSC 1861 Microbiology Lab Writing Practicum

Elective courses; 7 credits

Students must complete at least seven credits in elective courses by choosing a combination of courses from this list that includes at least one lab or field course.

Lecture courses

BIOSC 0370 Ecology
BIOSC 1120 Biostatistics
BIOSC 1130 Evolution
BIOSC 1275 Genomics
BIOSC 1280 Microbial Genetic Engineering
BIOSC 1500 Cell Biology
BIOSC 1540 Computational Biology

BIOSC 1730 Virology
BIOSC 1760 Immunology
BIOSC 1820 Metabolic Pathways and Regulation (with 1810) *
BIOSC 1940 Molecular Biology
BIOSC 1945 Adv Molecular Biology
BIOSC 1998 Beneficial Microbes, Symbiosis, and the Microbiome
BIOSC 1999 Medical Microbiology
CHEM 1830 Synthetic Biology

*Note: This course must be taken in conjunction with BIOSC 1810; the pair of courses are in lieu of BIOSC 1000.

Lab courses

BIOSC 0352 Introduction to Molecular Genetics Lab
BIOSC 0390 Ecology Lab
BIOSC 1005 Introduction to Biochemistry Lab
BIOSC 1285 Genomics Lab
BIOSC 1290 Microbial Genetics
BIOSC 1510 Cell Biology Lab
BIOSC 1740 Virology Lab

Summer courses

BIOSC 0370+0390 Ecology +Lab (PLE)
BIOSC 1360 Ecology of Fungi (PLE)
BIOSC 1400 Disease Ecology (PLE)

Co-requisite courses

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 course; choose one of the following pairs of courses

PHYS 0110 Introduction to Physics 1

PHYS 0111 Introduction to Physics 2

PHYS 0174 Basic Physics for Science & Engineering 1

PHYS 0175 Basic Physics for Science & Engineering 2

Frederick Honors College equivalent courses may be substituted for required or elective courses.

Writing (W) requirement

Students must complete at least one W-course in the major.

BIOSC 1571, 1741 and BIOSC 1861 meet this requirement.

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 earn a minimum GPA of 2.0 in their co-requisite courses. A passing grade of C- or lower in a co-requisite course can be accepted if balanced by a higher grade in another co-requisite course so that the co-requisite GPA is 2.0 or higher.

Exceptions: CHEM 0110 and CHEM 0120 must be C or better to declare the major; PHYS 0110/0174 has to be C or better to enroll in PHYS 0111/0175; MATH 0220 has to be C or better to enroll in MATH 0230.

Satisfactory/No Credit option

One BIOSC course can be taken on an S/NC basis.

Restrictions

All BIOSC courses at the 0800-level are designed for non-majors. These courses do not count toward the major. Undergraduate teaching assistant (BIOSC 1690), independent study (BIOSC 1901), and undergraduate research credits (e.g., BIOSC 1903) do not count toward the major, though the department encourages students to pursue these opportunities.

Note about biochemistry options: BIOSC 1000 and 1810 are considered course repeats, and you cannot take both for credit.

Honors

A Dietrich School student may achieve honors in the Department of Biological Sciences by meeting academic and research requirements specified here: www.biology.pitt.edu/undergraduate/advising-and-support/honors

Advising

The Biological Sciences Departmental Advisors are happy to meet with undeclared students, please make an appointment using Navigate Student. Students will officially be advised by the Bio Advising Team after declaring a major offered in the department. After declaring you will receive a welcome email with instructions by either late September or late January

(depending on declaration date). Advising e-mail:

BioAdv@Pitt.edu

The Bio Advising Team supports and enriches the academic experience of students by helping with curricular decisions, as well as providing information and guidance on extracurricular options, career paths, and post-graduate plans. Information about our advising team can be found: www.biology.pitt.edu/undergraduate/advising-and-support/advisors

Declaring the major: Before students officially declare the Biological Sciences major, they must complete BIOSC 0150, 0160 and CHEM 0110, 0120 with a grade of C (not C-) or better and cannot be in violation of [DSAS repeat rules](#). 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 Department major options

Biochemistry	Biological Sciences
Computational Biology	Ecology and Evolution
Molecular Biology	

Checklist for the Microbiology major

Biological Science courses

_____ BIOSC 0150 or 0155 (UHC)
_____ BIOSC 005X
_____ BIOSC 0160 or 0165 (UHC)
_____ BIOSC 006X
_____ BIOSC 0350
_____ BIOSC 1000 or (1810 and 1820)
_____ BIOSC 1570
_____ BIOSC 1850
_____ BIOSC 1860
_____ BIOSC 1865
_____ BIOSC 1280

Writing Course

_____ BIOSC 1571 or 1741 or 1861

Elective courses (7 credits)

_____ BIOSC _____
_____ BIOSC _____
_____ BIOSC _____ (Lab course or field course)

Co-Requisite courses

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 MATH 0235 or STAT 1000

Physics courses

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

Note: While not required for the major, PHYS 0212 Introduction to Laboratory Physics or 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.