



# Microbiology Major

[www.Biology.Pitt.edu](http://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

BIO SC 0150 Foundations of Biology 1  
BIO SC 005X Foundations of Biology Lab 1  
BIO SC 0160 Foundations of Biology 2  
BIO SC 006X Foundations of Biology Lab 2  
BIO SC 0350 Genetics  
BIO SC 1000 Biochemistry\*  
BIO SC 1570 Microbiology Seminar  
BIO SC 1850 Microbiology  
BIO SC 1860 Microbiology Laboratory  
BIO SC 1865 Microbial Physiology  
BIO SC 1280 Microbial Genetics

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

### One of the following writing-intensive courses

BIO SC 1291 Experim. Gen. Eng. Lab Writing Practicum  
BIO SC 1571 Microbiology Seminar Writing Practicum  
BIO SC 1741 Virology Lab Writing Practicum  
BIO SC 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

BIO SC 0370 Ecology  
BIO SC 1120 Biostatistics  
BIO SC 1130 Evolution  
BIO SC 1275 Genomics  
BIO SC 1280 Microbial Genetic Engineering  
BIO SC 1500 Cell Biology

BIO SC 1540 Computational Biology  
BIO SC 1730 Virology  
BIO SC 1760 Immunology  
BIO SC 1820 Metabolic Pathways and Regulation (with 1810) \*  
BIO SC 1940 Molecular Biology  
BIO SC 1945 Adv Molecular Biology  
BIO SC 1998 Beneficial Microbes  
BIO SC 1999 Medical Microbiology  
CHEM 1830 Synthetic Biology

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

### Lab courses

BIO SC 0352 Introduction to Molecular Genetics Lab  
BIO SC 0390 Ecology Lab  
BIO SC 1005 Introduction to Biochemistry Lab  
BIO SC 1285 Genomics Lab  
BIO SC 1290 Experimental Genetic Engineering  
BIO SC 1510 Cell Biology Lab  
BIO SC 1740 Virology Lab

### Summer courses

BIO SC 0370+0390 Ecology +Lab (PLE)  
BIO SC 1360 Ecology of Fungi (PLE)  
BIO SC 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](http://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](mailto: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](http://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 1291 or 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.