



Biochemistry Major

www.biology.pitt.edu

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Biochemistry is the study of how molecules in organisms work and interact at a chemical and physical level. Biochemistry can be used to study the underpinnings of processes in a wide range of disciplines, including cell biology, developmental biology, and molecular biology. Biochemical and molecular developments have revolutionized biological research, fueling the explosive growth in the biotechnology industry and rapid increase of molecular medicine.

The Biochemistry Major provides a strong background for many science careers, incorporating the requirements for admission to medical, dental, and other health professional schools and to graduate schools in biochemistry, cell and molecular biology, and related disciplines. Positions for biochemists at the BS, MS, and PhD levels are available in the biotechnology industries as well as in universities, medical schools, hospitals, government laboratories, research institutes, and public health institutions.

Required courses for the Biochemistry 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 1470 Biophysical Chemistry*
BIOSC 1580 Biochemistry Seminar
BIOSC 1810 Macromolecular Structure and Function
BIOSC 1820 Metabolic Pathways and Regulations
BIOSC 1830 Biochemistry Laboratory
BIOSC 1940 Molecular Biology

*Note: The Physical Chemistry sequence of CHEM 1410 and 1420 can be taken in lieu of BIOSC 1470.

One of the following writing-intensive courses

BIOSC 1581 Biochemistry Seminar Writing Practicum
BIOSC 1831 Biochemistry Laboratory Writing Practicum

Elective courses; 7 credits

Students must complete at least seven credits in elective courses by choosing two lecture courses and one lab course from the following lists.

Lecture Courses

BIOSC 1120 Biostatistics
BIOSC 1130 Evolution
BIOSC 1250 Human Physiology
BIOSC 1275 Genomics
BIOSC 1280 Microbial Genetics
BIOSC 1455 Human Endocrinology
BIOSC 1500 Cell Biology
BIOSC 1520 Developmental Biology
BIOSC 1540 Computational Biology
BIOSC 1730 Virology
BIOSC 1760 Immunology
BIOSC 1850 Microbiology

BIOSC 1865 Microbial Physiology
BIOSC 1945 Advanced Molecular Biology
CHEM 1830 Synthetic Biology

Lab Courses

BIOSC 0351 Genetics Laboratory
BIOSC 0352 Introduction to Molecular Genetics Laboratory
BIOSC 1285 Genomics Laboratory
BIOSC 1510 Cell Biology Laboratory
BIOSC 1530 Developmental Biology Laboratory
BIOSC 1740 Virology Laboratory
BIOSC 1855 Introduction to Microbiology Laboratory

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 Laboratory

Mathematics courses

MATH 0220 Analytic Geometry and Calculus 1
MATH 0230 Analytic Geometry and Calculus 2

Note: MATH 0235 counts as both MATH 0220 and 0230.

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 Sci. & Engineering 1, 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 1581 and BIOSC 1831 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.

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:

<https://www.biology.pitt.edu/undergraduate/advising-and-support/advisors>

Declaring the major: Before students officially declare the 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 Biology Department major options:

Biological Sciences Computational Biology
Ecology and Evolution Microbiology
Molecular Biology

Checklist for the Biochemistry major

Biological Science courses

_____ BIOSC 0150 or 155 (UHC)
_____ BIOSC 005X
_____ BIOSC 0160 or 165 (UHC)
_____ BIOSC 006X
_____ BIOSC 0350
_____ BIOSC 1470
_____ BIOSC 1580
_____ BIOSC 1810
_____ BIOSC 1820
_____ BIOSC 1830
_____ BIOSC 1940

Writing Course

_____ BIOSC 1581 or 1831

Elective courses (7 credits)

Lecture Courses

_____ BIOSC _____
_____ BIOSC _____
_____ BIOSC _____ (Lab course)

Co-Requisite courses

Chemistry courses

_____ CHEM 0110
_____ CHEM 0120
_____ CHEM 0310
_____ CHEM 0320
_____ CHEM 0345

Mathematics courses

_____ MATH 0220
_____ MATH 0230

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.