Computational Biology is a growing field of study in the life sciences. This major trains students in computer programming, laboratory techniques, and other skills they will need to succeed in graduate school and in the workforce. This program is administered by the Department of Biological Sciences in the Dietrich School and the Department of Computer Science in the School of Computing and Information.

Requirements for the Computational Biology major

**Biological Science courses**
- BIOSC 0150 Foundations of Biology 1
- BIOSC 0160 Foundations of Biology 2
- BIOSC 0350 Genetics
- BIOSC 1000 Biochemistry*

*Note: Students may alternately choose BIOSC 1810 (Macromolecular Structure and Function) and BIOSC 1820 (Metabolic Pathways) in lieu of BIOSC 1000. In this case, BIOSC 1820 becomes the elective course.

**Computer Science courses**
- CS 0011 Introduction to Computing for Scientists%
- CMPINF 0401 Intermediate Programming
- CS 0441 Discrete Structures
- CS 0445 Algorithms Data Structures 1
- CS 1501 Algorithm Data Structures 2
- CS 1656 Introduction to Data Science

%Note: or equivalent or placement assessment exemption

**Computational Biology courses**
- BIOSC 1540 Computational Biology
- BIOSC 1542 Computational Genomics OR BIOSC 1544 Simulation and Modeling
- BIOSC 1630 Computational Biology Seminar
- BIOSC 1640 Computational Biology Research Course OR CS 1640 Bioinformatics Software Design

**Elective courses; 3 credits**
Students must complete at least three credits in elective courses by choosing from the following list.
- BIOSC 0351 Genetics Lab
- BIOSC 0370 Ecology
- BIOSC 1005 Introduction to Biochemistry Lab
- BIOSC 1130 Evolution
- BIOSC 1285 Genomics Lab
- BIOSC 1320 Population Biology
- BIOSC 1500 Cell Biology
- BIOSC 1520 Developmental Biology
- BIOSC 1545 Mathematics of Biology
- BIOSC 1760 Immunology
- BIOSC 1820 Metabolic Pathways and Regulation (with 1810) *
- BIOSC 1850 Microbiology
- BIOSC 1940 Molecular Biology
- CHEM 0250 Analytical Chemistry
- CHEM 0320 Organic Chemistry 2
- CHEM 1460 Introduction to Modern Computational Science
- CHEM 1830 Synthetic Biology
- CS 1502 Formal Methods in Computer Science
- CS 1520 Programming Languages for Web Applications
- CS 1555 Database Management Systems
- CS 1566 Introduction to Computer Graphics
- CS 1675 Introduction to Machine Learning
- MATH 0230 Analytical Geometry and Calculus 2
- MATH 0280 Introduction to Matrices and Linear Algebra
- NROSCI 1000 Introduction to Neuroscience
- PHYS 0174 Basic Physics for Science and Engineering 1
- STAT 1221 Applied Regression

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

**Co-requisite courses**

**Chemistry courses**
- CHEM 0110 General Chemistry 1
- CHEM 0120 General Chemistry 2
- CHEM 0310 Organic Chemistry 2

**Mathematics and Statistics courses**
- MATH 0220 Analytic Geometry and Calculus 1
- STAT 1000 Applied Statistical Methods

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 1630 meets this requirement.

**Grade requirements**

**BIOSC/CS courses:** All courses offered by Biological Sciences and Computer Science must be completed with a letter grade of C or better.

**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 core course required for the major may 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 – DSAS Students
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:  

Advising – SCI Students
Students completing the Computational Biology major through the School of Computing and Information need to contact  
SCIAdvising@Pitt.edu.

Declaring the major: Before students officially declare the Computational Biology major, they must have completed BIOSC 0150, BIOSC 0160, CHEM 0110, CHEM 0120, and CS 0011 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 Department major options
Biological Sciences  Biochemistry
Ecology and Evolution  Microbiology
Molecular Biology

Checklist for the Computational Biology major

Biological Science courses
_______ BIOSC 0150 or 0155 (UHC)
_______ BIOSC 0160 or 0165 (UHC)
_______ BIOSC 0350
_______ BIOSC 1000 or (1810 and 1820)

Computer Science courses
_______ CS 0011 _______ CS 0445
_______ CMPINF 0401 _______ CS 1501
_______ CS 0441 _______ CS 1656

Computational Biology courses
_______ BIOSC 1540
_______ BIOSC 1542 or BIOSC 1544
_______ BIOSC 1640 or CS 1640

Elective course (3 credits)
_______

Writing Course
_______ BIOSC 1630

Electives (3 credits)
_______ BIOSC 0351 _______ CHEM 0320
_______ BIOSC 0370 _______ CHEM 1460
_______ BIOSC 1005 _______ CHEM 1830
_______ BIOSC 1130 _______ CS 1502
_______ BIOSC 1285 _______ CS 1520
_______ BIOSC 1320 _______ CS 1555
_______ BIOSC 1500 _______ CS 1666
_______ BIOSC 1520 _______ CS 1675
_______ BIOSC 1545 _______ MATH 0230
_______ BIOSC 1760 _______ MATH 0280
_______ BIOSC 1820 _______ NROSCI 1000
_______ BIOSC 1850 _______ PHYS 0174
_______ BIOSC 1940 _______ STAT 1221
_______ CHEM 0250

Co-requisite courses
Chemistry
_______ CHEM 0110 or 0710
_______ CHEM 0120 or 0720
_______ CHEM 0310 or 0730

Mathematics and Statistics courses
_______ MATH 0220
_______ STAT 1000