



Pitt

Kenneth P. Dietrich
School of Arts and Sciences

Computational Biology Major

www.Biology.Pitt.edu

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Computational biology is a growing field of study in the life sciences. This major trains students in the 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,

Required courses for the Biological Sciences major

The Computational Biology major requires completion of 61-66 credits of coursework, detailed as follows.

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
CS 0401 Intermediate Programming
CS 0441 Discrete Structures
CS 0445 Data Structures
CS 1501 Algorithm Implementation
CS 1656 Introduction to Data Science

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

Co-requisite courses

Chemistry

CHEM 0110 General Chemistry 1
CHEM 0120 General Chemistry 2
CHEM 0310 Organic Chemistry 1

Mathematics and Statistics courses

MATH 0220 Analytic Geometry and Calculus 1
STAT 1000 Applied Statistical Methods

Note: Any University Honors College (UHC) equivalents to required courses or elective courses are acceptable.

Elective courses; select one course

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 *
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.

Writing (W) requirement

Students must complete at least one W-course in the major. BIOSC 1630 meets this requirement.

Grade requirements

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

Satisfactory/Audit option

One core course required for the major may be taken on an S/NC basis.

Co-Requisite courses

Students must complete co-requisite courses in the departments of Mathematics, Statistics, and Chemistry with an overall average of C or better, with the exceptions of CHEM 0110 and CHEM 0120. Students must earn letter grades of C or better in each of these classes.

Honors

A Dietrich School student may achieve honors in the Department of Biological Sciences by meeting these requirements:

Maintain a minimum GPA of 3.25; and
Complete a faculty-supported research project.

Advising

The Biological Sciences Departmental Advisors are located in A258 Langley Hall. You are encouraged to stop by to peruse handouts or meet with an advisor even before declaring a major. They love visitors! Students will officially be advised by the Biological Sciences Advising office after declaring a major offered in the department.

Advisors

Available year round

Christine Berliner Kevin Wu
LANGY A258 LANGY A258
412-624-4819 412-624-4273

Available during the academic year

Ellen Kelsey Jessica Wandelt Dan Wetzel
LANGY A258 LANGY A258 LANGY A258
412-624-0421 412-624-7192 412-648-4286

Advising e-mail: BioADV@Pitt.edu

School of Computing and Information students

Students completing the Computational Biology major through the School of Computing and Information need to contact SCIAdivising@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.

Restrictions

All BIOSC courses at the 0800-level are designed for non-majors. Therefore, these courses do not count toward the major. Independent study and independent research credits do not count toward the major. The department encourages students to pursue these opportunities.

Other Biological Sciences major options

Biological Sciences Ecology and Evolution
Microbiology Molecular Biology

Checklist for the Computational Biology major

Biological Science courses

_____ BIOSC 0150 or 0715
_____ BIOSC 0160 or 0716
_____ BIOSC 0350
_____ BIOSC 1000 *

Computer Science courses

_____ CS 0011
_____ CS 0401
_____ CS 0441
_____ CS 0445
_____ CS 1501
_____ CS 1656

Computational Biology courses

_____ BIOSC 1540
_____ BIOSC 1542 or BIOSC 1544
_____ BIOSC 1630
_____ BIOSC 1640 or CS 1640

Co-requisite courses

Chemistry

_____ CHEM 0110 or 0710
_____ CHEM 0120 or 0720
_____ CHEM 0310 or 0730

Mathematics and Statistics courses

_____ MATH 0220
_____ STAT 1000

Electives; choose one course

_____ BIOSC 0351
_____ BIOSC 0370
_____ BIOSC 1005
_____ BIOSC 1130
_____ BIOSC 1285
_____ BIOSC 1320
_____ BIOSC 1500
_____ BIOSC 1520
_____ BIOSC 1545
_____ BIOSC 1760
_____ BIOSC 1820 *
_____ BIOSC 1850
_____ BIOSC 1940
_____ CHEM 0250
_____ CHEM 0320
_____ CHEM 1460
_____ CHEM 1830
_____ CS 1502
_____ CS 1520
_____ CS 1555
_____ CS 1566
_____ CS 1675
_____ MATH 0230
_____ MATH 0280
_____ NROSCI 1000
_____ PHYS 0174
_____ STAT 1221

*Students may choose BIOSC 1810 Macromolecular Structure and Function and BIOSC 1820 Metabolic Pathways in lieu of BIOSC 1000. In this case, students will take two elective courses