

Computational Biology (BS)

*This program is offered by the College of Arts & Sciences/
Biological Sciences Department, and is only available at the St.
Louis home campus.*

Program Description

The bachelor of science in computational biology is a rigorous degree designed for students who seek cross-disciplinary education in biology, math and computer science. The program provides the student with a broad scientific foundation suitable immediately upon graduation for careers in biological information analysis in fields like: bioinformatics, the biotechnology industry, medicine, research in computational biology or bioinformatics, healthcare, or the chemical and molecular disciplines.

Learning Outcomes

Upon completion of the computational biology program, students will be able to:

- Explain the origin, rationale and uses of large datasets used to study biological processes in living organisms.
- Perform computational analyses of biological datasets and relate the results to core principles in biology.
- Use computational methods to help execute a biological research plan.
- Analyze biological problems from global and ethical impact perspectives (impact of computational biology methods).

Degree Requirements

A minimum of 128 credit hours consisting of the following:

- 73 required credit hours
- Applicable University Global Citizenship Program hours
- Electives

Curriculum

Core Courses (45 hours)

- BIOL 1550 Essentials of Biology I (4 hours)
and BIOL 1551 Essentials of Biology I: Lab (1 hour)
- BIOL 1560 Essentials of Biology II (4 hours)
and BIOL 1561 Essentials of Biology II: Lab (1 hour)
- BIOL 2010 Evolution (3 hours)
- BIOL 3050 Genetics (3 hours)
and BIOL 3051 Genetics: Lab (1 hour)
- BIOL 4400 Research Methods (3 hours)
- BIOL 4440 Senior Thesis for BS in Computational Biology (4 hours)
- CHEM 1100 General Chemistry I (3 hours)
and CHEM 1101 General Chemistry I: Lab (1 hour)
- CHEM 1110 General Chemistry II (3 hours)
and CHEM 1111 General Chemistry II: Lab (1 hour)
- CHEM 2100 Organic Chemistry I (3 hours)
and CHEM 2101 Organic Chemistry I: Lab (1 hour)
- CHEM 3100 Biochemistry I (3 hours)
and CHEM 3101 Biochemistry I: Lab (1 hour)
- MATH 1610 Calculus I (5 hours)

Biology Courses (10 hours)

- BIOL 1580 Introduction to Computational Biology (3 hours)
- BIOL 4050 Gene Expression (3 hours)
- BIOL 4800 Computational Biology (4 hours)

Math and Computer Science Courses (15 hours)

- COSC 1550 Computer Programming I (3 hours)
- COSC 1560 Computer Programming II (3 hours)

- CSIS or COSC 3000+ level course (3 hours)
- MATH 3200 Statistics (3 hours)
- MATH 3610 Probability (3 hours)

One of the following courses

- MATH 3210 Data Mining Foundations (3 hours)
- MATH 3220 Data Mining Methods (3 hours)