Twin Cities Campus

Computational Biology Minor
College of Biological Sciences - Adm
College of Biological Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2020
- Required credits in this minor: 25 to 26

Large-scale data is now a norm in biology and the math and computational skills needed to analyze large-scale data have become crucial in almost every field of biology. For example, the analysis of big data is essential for modern personalized medicine and precision agriculture. The ability to properly analyze and interpret biological data requires biological knowledge and experience as well. Accordingly, the number of biology-related jobs that require math or computational skills has been rapidly increasing in both industry and academia. Courses in the minor were selected mainly because they combine computation or mathematical analysis with biology. The minor is designed to give undergraduate students in biology-related majors the math and computational skills necessary for current biological research.

Program Delivery
This program is available:
- via classroom (the majority of instruction is face-to-face)

Admission Requirements
For information about University of Minnesota admission requirements, visit the Office of Admissions website.

Required prerequisites
Prerequisites
These courses are prerequisites for courses required in the minor.
BIOL 1009 - General Biology [BIOL] (4.0 cr)
or BIOL 1951 - Foundations of Biology Lecture I for Biological Sciences Majors [BIOL] (4.0 cr)
or BIOL 1951H - Foundations of Biology Lecture I for Biological Sciences Majors [BIOL] (4.0 cr)

Minor Requirements
Students may take both BIOL 3272/3272H/5272 and CSCI 3003 and can count one of them as a required course and the other for additional credits toward the minor.

Genetics
GCD 3022 - Genetics (3.0 cr)
or BIOL 4003 - Genetics (3.0 cr)

Applied Biostatistics or Intro to Computing in Biology
BIOL 3272 - Applied Biostatistics (4.0 cr)
or BIOL 3272H - Applied Biostatistics (4.0 cr)
or BIOL 5272 - Applied Biostatistics (4.0 cr)
or CSCI 3003 - Introduction to Computing in Biology (3.0 cr)

Computational Biology Minor Electives
Take 15 or more credit(s) from the following:
- AGRO 5431 - Applied Plant Genomics and Bioinformatics (3.0 cr)
- BIOC 4521 - Introduction to Physical Biochemistry (3.0 cr)
- BIOC 5361 - Microbial Genomics and Bioinformatics (3.0 cr)
- BIOC 5527 *{Inactive}* (4.0 cr)
- CSCI 3003 - Introduction to Computing in Biology (3.0 cr)
- CSCI 5461 - Functional Genomics, Systems Biology, and Bioinformatics (3.0 cr)
- CSCI 5481 - Computational Techniques for Genomics (3.0 cr)
- EEB 5042 - Quantitative Genetics (3.0 cr)
- EEB 5371 - Principles of Systematics (3.0 cr)
- GCD 3485 - Bioinformatic Analysis: Introduction to the Computational Characterization of Genes and Proteins (4.0 cr)
- GCD 5005 - Computer Programming for Biology (3.0 cr)
- MATH 2241 - Mathematical Modeling of Biological Systems (3.0 cr)
- PHCL 5111 - Pharmacogenomics (3.0 cr)

- PLPA 5301 - Large Scale Omic Data in Plant Biology (3.0 cr)
- VMED 5181 - Spatial Analysis in Infectious Disease Epidemiology (3.0 cr)
- BIOL 3272 - Applied Biostatistics (4.0 cr)
  or BIOL 3272H - Applied Biostatistics (4.0 cr)
  or BIOL 5272 - Applied Biostatistics (4.0 cr)