Program in Bioinformatics and Computational Biology

The interdisciplinary program in Bioinformatics and Computational Biology is administered by the College of Science (https://catalog.uidaho.edu/colleges-related-units/science). (http://www.uidaho.edu/sci)

Technological advances in the last two decades have created an avalanche of biological data, and this challenge will only grow in the immediate future. Modern tools and knowledge to analyze and interpret large, complex datasets are thus increasingly central to much of biology. They are required to improve human health, natural and agricultural resource management, and to simply understand the natural world better. Moreover, industries and agencies in the areas of health, agriculture, and conservation require workers who master these new tools and knowledge. It has become increasingly clear that success in science requires an integrative approach that unites experimental design, data collection, analysis and interpretation in a common framework. To meet this need, the University of Idaho launched the interdisciplinary Bioinformatics and Computational Biology (BCB) graduate program in 2003. This program includes faculty with expertise in the Biological Sciences, Mathematics, Statistics, and Computer science.

The University of Idaho offers M.S. and Ph.D. degrees in Bioinformatics and Computational Biology (BCB) as well as a graduate certificate in BCB. The BCB program is offered on-campus in Moscow at the University of Idaho, and is administered by the College of Science.

A degree in BCB will require coursework and practical experience in biology, mathematics, statistics, and computer science. The focus of the degree will be on learning to develop and use computational and mathematical tools to analyze biological data. BCB is a highly interdisciplinary program. It requires students and faculty to bridge these disciplines. BCB faculty members are drawn from twelve departments from the Colleges of Agricultural and Life Sciences, Engineering, Letters, Arts and Social Sciences, Natural Resources and Science. These faculty members are available to serve on BCB graduate student committees.

The M.S. and Ph.D. degrees prepare students for a lifetime of discovery. They enable the graduate to advance the state of the art, not merely to keep up with it. The graduate program develops the student's critical thinking, investigatory, and expository skills. He/she will acquire the methodological skills to resolve important open problems and tackle challenging new projects. The student will learn to present problems and solutions, both orally and in writing.

Eva Top, BCB Program Director (258 Life Sciences South 83844-3051; phone 208-885-5015 bcb@uidaho.edu; www.uidaho.edu/sci/bcb).


Bioinformatics and Computational Biology Graduate Program

• Bioinformatics and Computational Biology Graduate Academic Certificate (https://catalog.uidaho.edu/colleges-related-units/science/bioinformatics-computational-biology/bioinformatics-computational-biology-graduate-academic-certificate)
• Bioinformatics and Computational Biology (M.S.) (https://catalog.uidaho.edu/colleges-related-units/science/bioinformatics-computational-biology/bioinformatics-computational-biology-m.s)
• Bioinformatics and Computational Biology (Ph.D.) (https://catalog.uidaho.edu/colleges-related-units/science/bioinformatics-computational-biology/bioinformatics-computational-biology-phd)

Bioinformatics and Computational Biology

BCB 404 (s) Special Topics
Max arranged.

BCB 500 Master’s Research and Thesis
Credit arranged.

BCB 501 (s) Seminar
Credit arranged

Students are required to attend all of the invited speaker presentations in the IBEST/CMCI/BCB seminar series for the semester they are enrolled. Students who miss one or more presentations are expected to attend an alternative seminar approved by the instructor. Additional meetings may be required by the instructor.

BCB 502 (s) Directed Study
Credit arranged.

BCB 503 (s) Workshop
Credit arranged.

BCB 504 (s) Special Topics
Credit arranged.

BCB 506 Laboratory Experience in the Biological Sciences
Credit arranged

Hands-on activities in an active research laboratory whose central research interests are in the biological or biochemical sciences. Prereq: Admission to BCB program.

BCB 507 Laboratory Experience in the Computational Sciences
Credit arranged

Hands-on activities in an active research laboratory whose central research interests are in the computational sciences. Prereq: Admission to BCB program.

BCB 508 Laboratory Experience in Mathematics or Statistics
Credit arranged

Hands-on activities in an active research laboratory whose central research interests are in the mathematics or statistics. Prereq: Admission to BCB program.
BCB 509 Evolutionary Biology for non-Life Scientists
3 credits
This course is offered by Michigan State University as part of the National Science Foundation BEACON Science and Technology Center on ‘evolution in action’. Life-scientists in general, and evolutionary biologists in particular, have a particular way of looking at the world that may seem unfamiliar or unusual to non-biologists. In this class, students learn to ‘think’ like an evolutionary biologist. This course builds a working understanding of biological evolution, enabling effective collaboration with evolutionary biologists. (Fall only)
Prereq: Graduate Standing .

BCB 510 Computational Science for Biologists
3 credits
This course is offered by Michigan State University as part of the National Science Foundation BEACON Science and Technology Center on ‘evolution in action’. This course develops computational skills and quantitative reasoning abilities, computational thinking, and exposure to computational research in evolutionary and molecular biology. We introduce the Python programming language, scripting and pipelining, simulations, and data analysis. We also introduce the Avida artificial life program as a platform for in silico evolution experimentations. (Fall only)
Prereq: Biol 421 or Instructor Permission .

BCB 511 Applied Bioinformatics
3 credits
A data driven approach to the computational and statistical understanding required to solve bioinformatics problems encountered in genome scale research. Recommended Preparation: CS 120, STAT 301, or BIOL 456. (Spring, alt/yr)

BCB 512 Multidisciplinary Approaches to the Study of Evolution
3 credits
This course is offered by Michigan State University as part of the National Science Foundation BEACON Science and Technology Center on ‘evolution in action’. This project-based course prepares students for team-based, multi-disciplinary and multi-institutional research into the evolutionary dynamics of biological and computational systems. The course objective is to recognize and overcome challenges such as discipline-specific languages, customs and world views. Students will also learn fundamentals of experimental design and statistical analysis. (Spring only)
Prereq: Graduate Standing .

BCB 597 (s) Practicum
Credit arranged.

BCB 598 (s) Internship
Credit arranged.

BCB 599 (s) Non-thesis Master’s Research
Credit arranged.

BCB 600 Doctoral Research and Dissertation
Credit arranged.