Computational and Genomic Biology

Graduate Division (http://grad.berkeley.edu)
Center Information: 174 Stanley Hall MC#3220, (510) 666-3342

Website: Center for Computational Biology (http://qb3.berkeley.edu/ccb)
Director: Rasmus Nielsen, PhD
Graduate Chair: Steven Brenner, PhD

Overview

Computational biology is an academic growth area that binds together multiple areas of biological research with the mathematical and computational sciences. It takes center stage in the new data-oriented biology by facilitating scientific discoveries based on high-throughput methods. The genomic revolution has fundamentally changed the biological sciences, and computational biology provides the means by which we translate the genomic discoveries into a new understanding of complex biological systems, and eventually to improvements of the human condition through development of solutions to environmental problems, new drug discoveries, and personalized medicine.

The Center for Computational Biology is Berkeley's hub for research and training in computational biology and bioinformatics. Through courses, seminars, scientific meetings, and innovative training programs for PhD students (see below), the Center catalyzes biological discoveries at the interface of biology, computation, and mathematics/statistics. As a campus strategic initiative, the Center fosters an interactive, innovative, and collegial environment for faculty, students, and postdocs drawn from five colleges and over a dozen academic departments. Faculty research interests are likewise diverse, ranging from computational and statistical genomics to population, comparative, and functional genomics; from bioinformatics and proteomics to evolutionary biology, phylogenomics, and statistical and computational methods development for modeling biological systems.

Graduate Programs

Computational Biology PhD

For information on the Computational Biology PhD program, please see the Computational Biology page in this bulletin (http://bulletin.berkeley.edu/archive/2013-14/departmentsandsubjects/computationalbiology) .

Designated Emphasis (DE) in Computational and Genomic Biology

The Designated Emphasis in Computational and Genomic Biology is for students from affiliated doctoral programs. The DE provides students with a solid foundation in the different facets of genomic research, and an awareness of the culture, techniques, and challenges of disciplines outside of their own. The training DE students receive enables them to collaborate across disciplinary boundaries to solve a wide range of computational biology and genomic problems, and it provides them with the ensuing competitive edge for the most desirable jobs in academia and industry, which increasingly require interdisciplinary training. Coursework requirements include three courses, participation in a group seminar and retreat, and a thesis on a germane topic. Students completing the program receive the designation "Designated Emphasis in Computational and Genomic Biology" on their diplomas. Students must apply before their Qualifying Examination. For a list of participating programs and courses, please visit the program's website (http://ccb.berkeley.edu/research-education/decgb) .

CMPBIO 201 Classics in Computational Biology 3 Units
Department: Computational Biology
Course level: Graduate
Term course may be offered: Fall
Grading: Letter grade.
Hours and format: 1 hour of Lecture and 2 hours of Discussion per week for 15 weeks.
Prerequisites: Acceptance in the Computational Biology Phd program; consent of instructor.
Research project and approaches in computational biology. An introducton to the diverse ways biological problems are investigated computationally through critical evaluation of the classics and recent peer-reviewed literature. This is the core course required of all Computational Biology graduate students.

CMPBIO 294A Introduction to Research in Computational Biology 2 - 12 Units
Department: Computational Biology
Course level: Graduate
Terms course may be offered: Fall and spring
Grading: Letter grade.
Hours and format: 2 to 20 hours of Laboratory per week for 15 weeks.
Prerequisites: Standing as a Computational Biology graduate student.
Closely supervised experimental or computational work under the direction of an individual faculty member; an introduction to methods and research approaches in particular areas of computational biology.
Course may be repeated for credit. Course may be repeated for credit when topic changes.

CMPBIO 294B Introduction to Research in Computational Biology 2 - 12 Units
Department: Computational Biology
Course level: Graduate
Terms course may be offered: Fall and spring
Grading: Letter grade.
Hours and format: 2 to 20 hours of Laboratory per week for 15 weeks.
Prerequisites: Standing as a Computational Biology graduate student.
Closely supervised experimental or computational work under the direction of an individual faculty member; an introduction to methods and research approaches in particular areas of computational biology.
Course may be repeated for credit. Course may be repeated for credit when topic changes.

CMPBIO 295 Individual Research for Doctoral Students 1 - 12 Units
Department: Computational Biology
Course level: Graduate
Terms course may be offered: Fall and spring
Grading: Letter grade.
Hours and format: 1 to 20 hour of Laboratory per week for 15 weeks.
Prerequisites: Acceptance in the Computational Biology PhD program; consent of instructor.
Laboratory research, conferences. Individual research under the supervision of a faculty member.
Course may be repeated for credit. Course may be repeated for credit when topic changes.