**CSB 472H1S - COMPUTATIONAL GENOMICS AND BIOINFORMATICS**

24L, 12T

**Lecturers:**

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**Prerequisites**: BIO230H1/255H1

**Recommended preparation:** BIO260H1/HMB265H1

Recent technological advances have driven a revolution in genomics research that has had a direct impact on both fundamental research as well as direct application in nearly biological disciplines. These advances have made the generation of genomic data relatively straightforward and inexpensive; nevertheless, the data are meaningless if they cannot be properly analyzes. Computational genomics and bioinformatics are the tools we use to extract biological information from complex genomic data.

CSB472 will teach you the fundamentals of analyzing genomic data. This course emphasizes understanding how core bioinformatic analyses work, the strengths and weaknesses of related methods, and the important parameters embedded in these analyses. CSB472 is not an applied methods course, nor a course to for developing new bioinformatic tools, but rather a course designed to provide you with a basic understanding of the principles underlying genome analyses. We will examine the fundamentals of sequence alignment, phylogenetic analyses, genome annotation, gene prediction, and gene expression data analysis. Theoretical, applied, and statistical issues will be addressed.

The material is presented as an inverted course. Lectures are pre-recorded and available prior to class. Class time is devoted to review of the lecture material, discussion of the primary literature related to the course material, and hands-on analysis laboratories. Note that CSB472 is much more focused on fundamentals than application. Students who are primarily interested in working with bioinformatic tools, rather than understanding how the tools work, should consider taking CSB352 rather than CSB472.

**Recommended text:** Zvelebil & Baum 2008 Understanding Bioinformatics. Garland Science, New York.

**Evaluation:** One assignment/presentation (15%), midterm (30%), final (30%), quizzes (15%), participation (10%)