

MCDB 5520 Bioinformatics and Genomics (3cr)

Detailed Schedule, Fall 2023

Instructor: Dr. Edward Chuong Course assistant (Computational component): Dr. Atma Ivancevic

Course meeting: Tu/Thur 1:00 - 2:15 pm JSCBB A115 Butcher Auditorium (in-person)

Virtual office hours: Tuesday 11:00AM-12:00PM at JSCBB E232 or over zoom, or by appointment

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

This is only a rough topic roadmap, and the schedule is subject to changes throughout the semester.

Date	Lecture topic
8/28/2023	Course Intro
8/31/2023	Sequencing
9/5/2023	Long Read Sequencing with Live Demo (Dr. Ivancevic)
9/7/2023	Nextflow/Docker/EPI2ME Installation Workshop (Dr. Ivancevic)
9/12/2023	Genome Assembly
9/14/2023	Genome Assembly & Coverage
9/19/2023	Alignment
9/21/2023	Alignment 2
9/26/2023	BLAST
9/28/2023	BLAST stats
10/3/2023	Gene annotation
10/5/2023	Hidden Markov Models
10/10/2023	Genome Evolution
10/12/2023	Genome Regulation
10/17/2023	No lecture
10/19/2023	GATTACA & genome ethics discussion (Dr. Ivancevic)
10/24/2023	GATTACA & genome ethics discussion (Dr. Ivancevic)
10/26/2023	Metagenomics
10/31/2023	3D Genome regulation
11/2/2023	Evolution of genome regulation
11/7/2023	Short read mapping algorithm
11/9/2023	Transcriptomics
11/14/2023	Expression profiling
11/16/2023	Single-cell technologies
11/21/2023	No class (Fall Break)
11/23/2023	No class (Fall Break)
11/28/2023	Dimensionality reduction methods
11/30/2023	Single Cell Analysis
12/5/2023	Human genomics
12/7/2023	CRISPR
12/12/2023	CRISPR 2
12/14/2023	Genomic Medicine / Wrap up