

BIOD25 Genomics

2013 Tentative Syllabus

Date	Topic	Related materials
Jan 9	Introduction to course and review of genetics/genomics technologies	<ul style="list-style-type: none"> Refer to genetics & molecular biology texts Science 291:1304-1351 (2001). The Sequence of the Human Genome
Jan 16	Quiz (20min), genomics technologies/ intro to bioinformatics	<ul style="list-style-type: none"> Refer to genetics & molecular biology texts http://gbrowse.arabidopsis.org/cgi-bin/gbrowse/arabidopsis/ http://bar.utoronto.ca/welcome.htm
Jan 23	DNA sequencing methods/annotation	Nature 453:56-64 (2008) Mapping and sequencing of structural variation from eight human genomes.
Jan 30	Databases and algorithms Sequence variation/SNPs	http://blast.ncbi.nlm.nih.gov/Blast.cgi (click on the 'help' link at top for info on BLAST programs).
Feb 6	Genome wide association studies	New Eng. J. Med 363:166-176 (2010). Genome wide Association Studies and Assessment of the Risk of Disease.
Feb 13	Midterm exam <ul style="list-style-type: none"> Bioinformatics assignment distributed 	2 hours—in class on material covered to date
Feb 27	Gene expression and the transcriptome;	Nature Reviews of Genetics 11:75-87 (2010). RNA processing and its regulation: global insights into biological networks
Mar 6	Microarrays, transcriptomics, and functional genomics <ul style="list-style-type: none"> Bioinformatics assignment due 	Cell 102:109-126 (2000) Functional Discovery via a Compendium of Expression Profiles
Mar 13	Functional genomics/chromatin dynamics	<ul style="list-style-type: none"> Trends in Genetics 27:72-79 (2011) The study of eQTL variations by RNA-seq: from SNPs to phenotypes Genome Research 13:524-530 (2003) Large-Scale Discovery of Induced Point Mutations With High-Throughput TILLING.
Mar 20	Student talks 4 x 25=100 min	
Mar 27	Student talks	
Apr 3	Student talks	
TBD	Final exam – 3 hours	

Marks distribution

Quiz: 1 x 5%=5%

Bioinformatics assignment: 1 x 5%=5%

Midterm=25%

Project= 30%

Final=35% (cumulative)

Bioinformatics Assignment: I will distribute DNA sequence files for you to analyze in various ways, using web based algorithms; we will cover some of these in class before you get the assignments. I will provide more specific information in the near future.

Exams: I assume you have a reasonably good background in genetics (prerequisite); Genomics builds on this knowledge, and like genetics, genomics is largely problem based. You will be asked to explain general theories and to develop strategies for experiments that address specific a questions/problems in genomics.

Project: The project will involve researching a topic in contemporary genomics. Go to the Project page for more information.

Contact Info:

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