

**COS/MOL 455/551 Tentative Syllabus
Fall 2011**

Date	Lecturer	Description
Thu Sep 15	Murphy	The Central Dogma and “Omics” Recommended Readings: Genomes, Ch. 1, Recombinant DNA Ch. 1-3
Tue Sep 20	Singh	Sequences: Introduction to sequence comparison Recommended Readings: Mount 2nd Ed., Ch. 1 and 3, pg. 70-93 Problem Set 1 handed out
Wed Sep 21	Precept	An Introduction to Probability and Perl Programming, Part I
Thu Sep 22	Singh	Sequences: Database Search and Matrices Recommended Reading: Mount, Ch. 3, pg. 94-111, Ch. 6, pg. 248-258
Tue Sep 27	Singh	Sequences: Multiple sequence alignments & profiles Recommended Reading: Mount, Ch. 5, pg. 173-189 Problem Set 1 due Problem Set 2 handed out
Wed Sep 28	Precept	Bayes, Probability Distributions, & Sequence Alignment Examples
Thu Sep 29	Murphy	Sequencing & Mapping Recommended Readings: Genomes 2-4, Recombinant DNA 10-11
Tue Oct 4	Murphy	Expression of genetic information Technologies for monitoring transcriptional networks Recommended Readings: Recombinant DNA Ch. 3, 13; Lockhart et al, Nature, 2000; Brown et al, Nature, 1999 Problem Set 2 due Problem Set 3 handed out
Wed Oct 5	Precept	Project Ideas and Resources
Thu Oct 6	Singh	Sequences: Profiles and motif finding Recommended Reading: Mount, Ch. 5, pg 189-214; Tompa review
Tue Oct 11	Singh	Sequences: Hidden Markov models Recommended Reading: Mount, Ch. 5, pg 204-210; Eddy Review Problem Set 3 due Problem Set 4 handed out
Wed Oct 12	Precept	More Probability and Statistic: Bayes Theorem, Classification, Markov chains, HMMs
Thu Oct 13	Murphy	Transcriptional networks: analysis I Recommended Readings: Eisen et al, Proc Natl Acad Sci, 1998; Quackenbush, Nature, 2001; Tavazoie et al, Nature, 1999
Tue Oct 18	Murphy	Transcriptional networks: analysis II Recommended Readings: Segal, 04, Beer, 04 Problem Set 4 due Preliminary project proposals due Problem Set 5 handed out
Wed Oct 19	Precept	Intro to Perl Programming, Part II: mainly real code examples
Thu Oct 20	Singh	Sequences: Phylogenetic reconstruction Recommended Reading: Mount Ch. 7
Tue Oct 25	Singh	Protein Structure and Function: Databases, Classification, Alignment Recommended Reading: Mount Ch. 10, pg. 410-444 Problem Set 5 Due Problem Set 6 handed out

Wed Oct 26	Precept	An Introduction to Microarray Analysis
Thu Oct 27	Singh	Protein Structure and Function: Prediction Recommended Reading: Mount Ch. 10, pg. 444-484
Tue Nov 1 Wed Nov 2 Thu Nov 3		No Class/Precept, Fall recess
Tue Nov 8	Murphy	Meta-Analysis and RNA-Seq Recommended reading: Segal, et al. Nat Genet 2004; Wang, et al. Nat Rev Genet 2009 (review)
Wed Nov 9	Precept	Evaluating Statistical Confidence
Thu Nov 10	Murphy	ChIP and biochemical genomics Final project proposal and progress report due
Tue Nov 15	Murphy	Post-transcriptional regulation of gene expression & small RNAs Recommended Readings: Bartel, 04; Stark et al., 2005 Problem Set 6 due Problem Set 7 handed out
Wed Nov 16	Precept	Project Meeting #1 Groups will have individual meetings with Alex to discuss their project. Each group will sign up for a half hour slot between Nov. 16 and Nov. 22. All group members must attend the meeting.
Thu Nov 17	Murphy	Y2H and Protein-X interactions
Tue Nov 22	Perlman	Proteomics and Mass Spec Required Readings: TBD Problem Set 7 due
Wed Nov 23 Thu Nov 24		No Class/Precept, Thanksgiving
Tue Nov 29	Noyes	Engineering Protein-DNA interactions Required Readings: TBD
Wed Nov 30	Precept	Project Meeting #2 Groups will have individual meetings with Alex to discuss their project. Each group will sign up for a half hour slot on either Nov. 30 or Dec. 7. All group members must attend the meeting.
Thu Dec 1	Singh	Protein Networks: Predicting protein interaction networks Recommended readings: TBD
Tue Dec 6	Singh	Protein Networks: Analyzing protein interaction networks Recommended Readings: Zhu, Gerstein, Snyder, Genes and Develop 2007
Wed Dec 7	Precept	Project Meeting #2 Groups will have individual meetings with Alex to discuss their project. Each group will sign up for a half hour slot on either Nov. 30 or Dec. 7. All group members must attend the meeting.
Thu Dec 8	Singh	Protein Networks: Towards the dynamic interactome Recommended Readings: TBD
Tue Dec 13 Thu Dec 15		Class Presentations