CISC 436/636 Computational Biology & Bioinformatics (Fall 2016)

Tentative Schedule

	Date	Topic	Readings	Handouts	Notes
1	8/30	Overview of the course		syllabus	
2	9/1	A Molecular Biology Primer: central dogma	Chapter 1, Kimball's page		
	9/6	Molecular Biology Tools: Cloning, PCR, DNA sequencing			
3	9/8	Whole Genome Sequencing: Mapping and Assembling			
4	9/13	Pairwise sequence alignment: dotplot, scoring matrices			
5	9/15	Pairwise sequence alignment: Needleman-Wunsch algorithm			HW1 out
	9/20	Pairwise sequence alignment: Smith-Waterman Algorithm			
6	9/22	Sequence alignment: statistical analysis Math Primer: P-value, Extreme value distribution			
7	9/27	Multiple sequence alignment			
8	9/29	Sequence alignment applications: database search			
9	10/4	Hidden Markov models: Viterbi algorithm			HW2 out (HW1 due)
10	10/6	Hidden Markov models: Forward and Backward algorithms			
11	10/11	Hidden Markov models:			

		Baum-Welch algorithm			
12	10/13	Hidden Markov models: Applications			
13	10/18	Review			
	10/20	**Midterm**			
	10/25	Phylogenetic prediction: Maximum parsimony			HW3 out (HW2 is due)
16	10/27	Phylogenetic prediction: Distance methods			
17	11/1	Phylogenetic prediction: Maximum likelihood approach			
18	11/3	Gene prediction and regulation			
	11/8	No Class (Election Day)			
19	11/10	Structure Prediction: RNA			
20	11/15	Structure Prediction: Protein secondary/tertiary structure			HW4 out (HW3 is due)
21	11/17	Systems biology: DNA Microarray, 2d gel, MSMS, yeast 2-hybrid.			
	11/22	No class (Thanksgiving)			
	11/24	No class (Thanksgiving)			
22	11/29	Systems biology: Gene expressions profiling and clustering (K-means)			
23	12/1	Systems biology: protein-protein interaction			HW4 is due
24	12/6	Inferences of biological networks			
25	12/8	Review			
	TBA	**Final Exam**			