

**16:682:534 Fundamentals of Genomics**  
Generic Syllabus  
Debashish Bhattacharya (DB) & Dana C. Price (DCP)

**COURSE SCHEDULE**

- 1: Course Introduction and big picture of evolution (DB)
- 2: Genome structure in prokaryotes and eukaryotes (DB)
- 3: Endosymbiosis and the chimeric origin of cells and their genomes (DB)
- 4: Bioinformatics I (DB)
- 5: Bioinformatics II (DCP); Sequencing lecture and lab tour
- 6: Special Lecture (Dan Gheba, PhD, Field Applications Specialist, Illumina, Inc.): A history of sequencing, applications of current technology, and prospects for the future
- 7: Genome assembly and gene prediction methods (DCP)
- 8: Sequence alignment (DB)
- 9: Phylogenetics (DB)
- 10: Phylogenomics (DCP)
- 11: Horizontal gene transfer in prokaryotes and viruses (DB)
- 12: Horizontal gene transfer in eukaryotes (DCP)
- 13: Genome reduction (DB): Pre-proposals due
- 14: Functional genomics (RNA-Seq) (DCP)
- 15: Midterm exam**
- 16: Debate 1 - Does horizontal gene transfer disqualify the concept of a tree of life?
- 17: Role of small RNAs in the genome (DB)
- 18: Single cell genomics (DCP)
- 19: Human disease genomics (DB)
- 20: Debate 2 – Does DNA provide the blueprint of life?
- 21: Metagenomics (biomes, amplicons, and sequence assembly) (DB)
- 22: Student presentations
- 23: Student presentations
- 24: Student presentations
- 25: Student presentations
- 26: Student presentations
- 27: Student presentations
- 28: Final exam**

Evaluation and Grading: Midterm: 20%, Pre-proposal: 5%, Final exam: 20%,  
Presentation: 20%, Final Essay: 15%, Research proposal: 20%