

life.umd.edu/classroom/BSCI410/

Instructor: Steve Mount smount@umd.edu x5-6934

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Meetings: Tu Th 11:00 BPS 1250 Aug. 31 through Dec. 12, 2006 (final Dec. 14).

We will not meet Sept. 19, Sept. 28 or Nov. 23 (Thanksgiving).

Required Text: "**Genetics: From Genes to Genomes.**" Hartwell et al.. 2nd edition. 2004

Recommended "Exploring Genomes." Young. 2003. www.whfreeman.com/young

 "Advanced Genetic Analysis." Hawley and Walker. Blackwell 2003.

 "Human Molecular Genetics 3." Strachan and Read. Wiley 2004.

Other texts online: <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=books>

Web life.umd.edu/classroom/BSCI410/ is the course web site.

WebCT (courses.umd.edu) will be used for posting grades.

Grading: Your grade will be based on five parts: homework, three mid-term exams, and a final. Each of these five parts will count 20% unless one of your exam grades is dropped, in which case the final will count 40%. See the web site for more details.

Syllabus in brief (much more detail is available on the web site):

Section I: Introduction, Background and Review. Lectures 1-6 given Aug. 31-Sep. 21

Homework I due 9-26, Homework II due 10-03. Exam I is Oct. 10.

What is molecular genetics? DNA as information and the central dogma. DNA replication and segregation, meiosis, Mendel, linkage, genetic maps, tetrad analysis, Hardy-Weinberg, genomics, bioinformatics and internet resources.

Section II: Molecular Biology and Gene Expression. Lectures 7-12 given Sep. 26-Oct. 19

Homework III due 10-19. Exam II is Oct. 31.

E. coli; molecular cloning, labeling, hybridization, microarrays, PCR, mutagenesis, sequencing; genome structure and organization; mechanisms of recombination, repair and transcription. .

Section III: Gene Expression and genomics Lectures 13-17 given Oct. 24-Nov. 9

Homework IV due 11-14. Exam III is Nov. 21.

RNA transcription, processing, translation, stability and localization; positional cloning; LOD scores, complex traits, allelic association and types of allele.

Section IV: Model Organisms and Genetic Analysis Lectures 18-23 given Nov. 14-Dec. 12

Homework V due 12-12. The final exam is Dec. 14.

Genome projects; Model Organisms (*Saccharomyces cerevisiae*, *Caenorhabditis elegans*, *Drosophila melanogaster*, *Arabidopsis thaliana*, *Mus musculus*), epistasis analysis, allelic variation, gene testing and gene therapy.

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