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**Instructor:** Steve Mount                      smount@umd.edu                      x5-6934  
**TA:**                      Zenas Chang                      changz@umd.edu  
**Meetings:**      Tu Th 11:00    BPS 1250      Sept. 2 through Dec. 11, 2008 (final Dec. 15, 8 am).  
We will not meet Sept. 30, Oct. 7, Oct. 9 or Nov. 27 (Thanksgiving).  
**Office Hours:** Mount, Mondays 4:30-6:00 (or by appointment; inform me in any case)  
                         Chang, by appointment only

**Required Text:** "Genetics: From Genes to Genomes." Hartwell et al.. 3<sup>rd</sup> edition. 2008  
(Additional texts are recommended on the web site)

**Web**                      [clfs.umd.edu/classroom/BSCI410/](http://clfs.umd.edu/classroom/BSCI410/) is the course web site.  
[Blackboard](#) 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:

#### **Section I: Genetic Information: replication, transmission and informatics**

**Lectures 1-6 given Sep. 2-Sep. 18**

**Homework I due 9-23, Homework II due 9-25. Exam I is Oct. 2.**

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

#### **Section II: Molecular Biology and Gene Expression.**

**Lectures 7-12 given Sep. 23-Oct. 23**

**Homework III due 10-28. Exam II is Nov. 6.**

*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. 28-Nov. 13**

**Homework IV due 11-20. Exam III is Dec. 4.**

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. 18-Dec. 11**

**Homework V due 12-11. The final exam is Mon., Dec. 15 at 8 a.m..**

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

**Much more detail is available on the web site.**

In particular, reading may be revised up until a lecture is given.

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