THE GEORGIA INSTITUTE OF TECHNOLOGY

Biology 2354 HP: Honors Genetics

Fall 2011 Tentative Syllabus

Course Description and Goals

The 3.0 credit hour Honors Genetics course is designed for students who have demonstrated a good understanding of biology. It is intended to expand a student's knowledge in genetics beyond what is presented in typical undergraduate courses. The main goal is to enable students to understand and appreciate the fundamental concepts of genetics, and to learn how to apply these concepts to solving problems and interpreting experiments.
The course covers many of the basic sub-disciplines of genetics, those that were initially studied during the past century as well as those that were discovered very recently. The course includes in-depth coverage of some specific topics, in addition to a comprehensive coverage of general genetic principles. In-depth coverage emphasizes an operational approach that focuses on how genetic analysis techniques are used to uncover the genetic rules and mechanisms of inheritance. The lecture course is coordinated with 2355HP Honors Genetics Lab. In addition to listed readings in the textbook, students will be given papers on certain topics for discussion in class. Reading material will be available on T-square as PDF files or as web links and references.

Professors: Contact Information

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Prerequisites: Biol 1510 or 1511 or consent of the school. **Co-requisite:** Biol 2355HP
**Eligibility: Any student in Honors Program who has taken BIOL 1511, or any other student who has received an A or B in either BIOL 1510 or BIOL 1511 and currently has an overall GPA 3.0 or above.*

Textbooks *A.F. Griffiths,S.R. Wessler, S.B. Carroll,and J. Doebley (2012) Introduction to Genetics Analysis (10th Edition). W.H. Freeman & Co. (required).*

Attendance: If you miss a lecture, *you* are responsible for obtaining all notes, announcements, and assignments. If you know that you must leave class early, sit in the back and leave quietly. *NOTE: Periodic attendance polls might be taken without warning. Attendance records will be taken into account in the borderline grade situations. Student with highest attendance records may get extra points at the end of the semester.*

Assessments:

Exams - 75% (Exam II, Final, and either Exam I or Exam III, whichever is best - 25% each)
Quizzes/homeworks, and class participation - 25%
Scale: 90-100% - A, 80-89% a B, 70-79% a C, 60-69% - D, <60% - F
(Subject to adjustment according to class performance.)
Written confirmation of a legitimate excuse, such as a severe illness, will be required for missing an exam. **Exam missed without a satisfactory reason will count as one of 3 exams contributing to the total grade. NO EXCEPTIONS!** Your conduct in the course should conform to the Student Honor Code (http://www.honor.gatech.edu/).

Tentative Lecture Schedule: *Class meets on Tuesday and Thursday 9:30 to 11 AM*

Week 1	(08/23)	Introduction (Ch. 1)	Chernoff
	(08/25)	Mendelian Inheritance I (Ch. 2)	Chernoff
Week 2	(08/30)	Mendelian Inheritance II (Ch. 2)	Chernoff
	(09/01)	Mendelian Inheritance III (Ch. 3.1-3.4)	Chernoff
Week 3	(09/06)	Linkage and Mapping I (Ch. 4)	Chernoff
	(09/08)	Linkage and Mapping II (Ch. 4)	Chernoff
Week 4	(09/13)	Discussion Session	Chernoff
	(09/15)	Exam I (covers weeks 1-4)	Chernoff
Week 5	(09/20)	Genetics of Bacteria, Viruses and Organelles (Ch. 3.5 and 5)	Chernoff
	(09/22)	Gene Interaction and Function (Ch. 6)	Chernoff
Week 6	(09/27)	Genes and Proteins (Ch. 9-1, 9-2 and 9-5)	Chernoff
	(09/29)	Large-Scale Chromosome Changes (Ch. 17)	Chernoff
Week 7	(10/04)	Population Genetics (Ch. 18)	Chernoff
	(10/06)	Molecular Evolution (Ch. 20 and outside sources)	Chernoff
Week 8	(10/11)	Discussion Session	Chernoff
	(10/13)	Exam II (covers weeks 1-8)	Chernoff
Week 9	(10/18)	Fall Recess	
	(10/20)	DNA Structure and Replication (Ch. 7)	Wartell
Week 10	(10/25)	Replication&Eukaryotic Chromosomes (Ch. 7,12.3)	Wartell
	(10/27)	RNA: Transcription and Processing (Ch. 8)	Wartell
Week 11	(11/01)	Protein Synthesis (Ch. 9-3, 9-4)	Wartell
	(11/03)	Regulation of Gene Expression I (Ch. 11)	Wartell
Week 12	(11/08)	Regulation of Gene Expression II (Ch. 12)	Wartell
	(11/10)	The Genetic Control of Development(Ch. 13)	Wartell
Week 13	(11/15)	Discussion Session	Wartell
	(11/17)	Exam III (covers weeks 9-13)	Wartell
Week 14	(11/22)	Gene Isolation & Manipulation I (Ch. 10)	Wartell
	(11/24)	Thanksgiving Holiday	
Week 15	(11/29)	Gene Isolation & Manipulation II (Ch. 10)	Wartell
	(12/01)	Genomes and Genomics (Ch. 14)	Wartell
Week 16	(12/06)	Mutation, Repair, Recombination (Ch. 16)	Wartell
	(12/08)	Discussion Session	Wartell
Finals week	(12/13 8AM)	Final Exam (covers weeks 9-16)	Wartell