

Biology 2354 HP: Honors Genetics

Fall 2014 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. The lecture course must be taken together with 2355HP Honors Genetics Lab. Although listed as separate courses, one cannot withdraw only from the lab course and continue taking the lecture course or vice versa. Both courses are intended to expand a student's knowledge in genetics beyond what is presented in typical undergraduate courses. The main goal of the lecture course 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 topics, in addition to a comprehensive coverage of general genetic principles. In-depth coverage emphasizes how genetic analysis techniques are used to uncover the genetic rules and mechanisms of inheritance. In addition to readings in the textbook, students will be given articles to provide more depth on certain topics and for discussion in class. Reading material will be available on T-square as PDF files or as web links and references.

Professors: Contact Information (Office hours by appointment)

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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.*

Textbook *R.J. Brooker (2015) Genetics Analysis & Principles (5th Edition). McGraw-Hill Educ. (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: Short answer quizzes will be given without warning as a means of assessing attendance and class understanding. Attendance will be taken into account in borderline grade situations. To quote Woody Allen, '80% of success is showing up'*

Assessments:

Exams - 80% (4 Exams - 20% each)

Quizzes/homeworks, and class participation - 20%

Scale: 90-100% - A, 80-89% - B, 70-79% - C, 60-69% - D, <60% - F

Written confirmation of a legitimate excuse, such as a severe illness, will be required for missing an exam. 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	(08/19)	Molecular Structures of DNA and RNA (Ch. 9)	WARTELL
	(08/21)	Chromosome Organization (Ch. 10)	WARTELL
Week 2	(08/26)	DNA Replication (Ch. 11)	WARTELL
	(08/28)	DNA Technologies (Ch. 20)	WARTELL
Week 3	(09/02)	Mendelian Inheritance (Ch. 1, 2)	TORRES
	(09/04)	Chromosome Transmission (Ch. 3, 19.1)	TORRES
Week 4	(09/09)	Extensions of Mendelian Inheritance (Ch. 4)	TORRES
	(09/11)	REVIEW/DISCUSSION	T & W
Week 5	(09/16)	EXAM I (covering weeks 1 – 4)	T & W
	(09/18)	Non-Mendelian Inheritance (Ch. 5)	TORRES
Week 6	(09/23)	Linkage and Mapping in Eukaryotes (Ch. 6)	TORRES
	(09/25)	Genetic Transfer and Mapping in Bacteria (Ch. 7)	TORRES
Week 7	(09/30)	Genomics I: Analysis of DNA (Ch. 22)	TORRES
	(10/02)	Population Genetics (Ch. 26)	TORRES
Week 8	(10/07)	REVIEW/DISCUSSION	TORRES
	(10/09)	EXAM II (covers weeks 1-8)	T & W
Week 9	(10/14)	FALL RECESS	
	(10/16)	RNA Transcription and Modification I (Ch. 12)	WARTELL
Week 10	(10/21)	RNA Transcription and Modification II (Ch. 12)	WARTELL
	(10/23)	Translation of mRNA I (Ch. 13)	WARTELL
Week 11	(10/28)	Translation of mRNA II (Ch. 13)	WARTELL
	(10/30)	Gene Regulation in Bacteria (Ch. 14)	WARTELL
Week 12	(11/04)	Gene Regulation in Eukaryotes I (Ch. 15)	WARTELL
	(11/06)	Gene Regulation in Eukaryotes II (Ch. 15)	WARTELL
Week 13	(11/11)	REVIEW/DISCUSSION	WARTELL
	(11/13)	EXAM III (covers weeks 9-13)	WARTELL
Week 14	(11/18)	Biotechnology (Ch. 21 + outside material)	TORRES
	(11/20)	Mutation (Ch. 8 & 18)	TORRES
Week 15	(11/25)	Genomics II: Functional Genomics, Proteomics	TORRES
	(11/27)	Thanksgiving Holiday	
Week 16	(12/02)	Medical Genetics and Cancer (Ch. 24)	WARTELL
	(12/04)	REVIEW/DISCUSSION	T & W
Finals week	(12/08)	FINAL EXAM (covers weeks 9-16)	T & W