

Biology 360 GENETICS Spring 2007 Course Syllabus

Course Text: *Introduction to Genetic Analysis* by Griffiths et al.; 8th edition, Freeman, 2005 and accompanying study guide /solutions manual and CD-ROM (ISBN 07167-62013).

Course Website: <http://webteach.csun.edu>

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Class Schedule: MW: 3:30 pm to 4:45 pm, EH 2225

Office Hours: R: 11:00 am- 1:00 pm
F: 11:00 am -1:00 pm
or by appointment

COURSE OBJECTIVES:

The past several decades have witnessed a revolution in genetics, beginning with unraveling the structure of DNA and deciphering the genetic code, to the creation of transgenic plants and animals, cloning, and most recently, mapping entire genomes. The goal of this course is to provide a clear perspective of the basic principles of the role of genes in heredity, cellular metabolism, and development and function of the organism. An overview of the latest developments and implications of functional genomics will also be provided.

Topics to be covered include:

- a. The role of genes in the control of heredity, encompassing the basic principles of Mendelian inheritance and deviations from those principles.
- b. Use of problem-solving skills to predict genetic outcomes.
- c. Structural organization of the genetic material, organization of genes into chromosomes, and mechanisms by which traits are either linked or inherited independently.
- d. Cell division, gene replication and transmission of genetic information to progeny. Mechanisms of gene expression.
- e. Molecular basis of genetic disease; mutations; the genetics of cancer; recent developments in genomic technology.

COURSE REQUIREMENTS:

This course is designed for students majoring in Biology. Prerequisites are: Biol 101 OR Biol 106 and 107, MATH 104 or MATH 105 or MATH 255A or passing score on Math Placement Test for admission to Math 255A; CHEM 102/L or CHEM 104. **A student**

should not attempt to take ANY of these prerequisites AND Biol 360 in the same semester.

To pass this course students are expected to:

- Attend class regularly, be attentive, participate in discussions and ask questions if a concept is not clear.
- Perform satisfactorily in ALL 7 quizzes, with a combined average of at least 50%.
- Satisfactorily perform in two mid-term exams with a combined average of at least 50%.
- Satisfactorily perform in the final exam with a score of at least 50%.

METHOD OF EVALUATION:

- Chapter-end Quizzes:** There will be seven end-of-chapter quizzes (see class schedule) worth 15 points each, for a total of 105 points (including 5 bonus points if you score perfect points in all of them). Questions will be in multiple-choice format. ***Please bring Scantron Form 815-E for each quiz.***
- Mid-term Exams:** There will be two mid-term exams, worth 100 points each. The format will be multiple choice (60 points) and problems (40 points). ***Please bring Scantron Form 886-E and a calculator for each exam.***
- Final Exam:** The comprehensive final exam will be worth 200 points (60% multiple choice, 40% problems). ***Please bring Scantron Form 886-E and a calculator for final exam.***

There will also be periodic take-home assignments, which may be turned in a week from the date assigned. Although the assignments will not be graded, students are expected to complete them. **There are no make-up exams or extra credits available.** Grades will be based on total points earned. There will be no curve.

A	≥ 95%	C+	74-70%
A-	94-90%	C	69-65%
B+	89-85%	C-	64-60%
B	84-80%	D	59-50%
B-	79-75%	F	< 50%

BIOLOGY DEPARTMENT WITHDRAWAL POLICY: Unrestricted withdrawals are permitted only until the end of the third week. Thereafter, requests to drop a class will be honored only when a *verifiable* serious and compelling reason exists and when there is no viable alternative to withdrawal. *Poor performance is NOT an acceptable reason for withdrawal.* During the last three weeks of the semester withdrawals will not be approved except when a student is withdrawing from ALL classes for verifiable medical reasons.

CHEATING AND PLAGIARISM: All forms of cheating and plagiarism (the claiming of the work of others as your own) are expressly forbidden by University rules and will not be tolerated. Any student observed cheating will be subject to disciplinary action by the University and may receive a grade of F in the course.

Spring 2007: BIOL 360
Class Schedule

	Date	Topic	Reading	Quiz Topic
Jan	29	Introduction to Genetics, Methodologies & Models	Chapter 1	
		Mendelian Genetics: Patterns of Inheritance	Chapter 2	
	31 *	Autosomal: Monohybrid crosses; law of segregation		Practice Quiz
Feb	5	Autosomal: Dihybrid crosses; law of independent assortment		
	7 *	Autosomal: Mendelian inheritance in humans; Pedigree Analysis		Mono & Dihybrids
	12	Sex Linked Inheritance: X and Y-linked Patterns		
		Chromosomal Basis of Inheritance	Chapter 3	
	14 *	Evidence of Chromosomal inheritance		Hum & Sex-linked In.
	19	Mitosis and Meiosis		
	21	Chromosome Structure		
	26	FIRST MIDTERM EXAM		Chapters 1-3
		Eukaryotic Chromosome Mapping & Recombination	Chapter 4	
	28	Gene linkage and recombination; Linkage Maps		
March	5	Three point crosses		
	7	Chi Square test; Problem Solving		
		From Gene to Phenotype	Chapter 6	
	12 *	Interactions between Alleles of One Gene		Chapter 4
	14	Interactions between Genes and Proteins		
		DNA Structure and Replication	Chapter 7	
	19 *	DNA structure and function		Chapte 6
	21	DNA replication		
		RNA: Transcription and Processing	Chapter 8	
	26	Transcription in Prokaryotes and Eukaryotes		
		Proteins and their Synthesis	Chapter 9	
	28 *	Protein Structure and Genetic Code		Chapter 7 & 8
April	2, 4	SPRING BREAK		
	9	Translation		
	11	SECOND MIDTERM EXAM		Chapters 4, 6-9
		Regulation of Gene Transcription	Chapter 10	
	16	Prokaryotic Gene Regulation		
	18	Lac Operon as the model		
	23	Eukaryotic Gene Regulation		
		Large-Scale Chromosomal Changes	Chapter 15	
	25 *	Changes in Chromosome Number		Chapter 10
	30	Changes in Chromosome Structure-I		
May	2	Changes in Chromosome Structure-II		
		Regulation of cell proliferation/Cancer Genetics	Chapter 17	
	7 *	Cell cycle; regulatory checkpoints		Chapter 15
	9	Genetic basis of cancer		
	14	Tumor Supressor Genes, Oncogenes		
	16	REVIEW		
	23	COMPREHENSIVE FINAL EXAM (3:00 pm to 5:00 pm)		

* indicates dates on which there will be a 15 min quiz at the beginning of class