

Biology 571 Molecular Diagnostics Fall 2007 Course Syllabus

Course Reference Book: The recommended reference book for this course is:

Human Molecular Genetics by Tom Strachan and Andrew Read (3rd edition, 2004, Garland Science)

This book is stocked in the Matador Bookstore under the course ticket.

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

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Class Schedule: TR: 9:30 am -10:45 am, LO1117

Office Hours: WR: 11:00 am – 1:00 pm or by appointment

Course Objectives:

This course aims to survey the basic principles of molecular biology and examine their relevance to the identification of disease-causing genes/mutations and the diagnosis of human genetic disorders. We will understand the structural organization of the human genome, starting from the basic molecules that comprise the genetic material and expanding to the overall organization of chromosomes. We will examine and understand modern tools employed to study DNA structure, identify variations in structure among individuals, and apply this information to determine the molecular basis of human diseases. We will also survey recent literature to obtain information about latest technological advances and diagnostic applications, and discuss the future prospects for molecular approaches to disease diagnosis.

On completion of this course, students will:

- Understand how the human genome is organized and what its salient features are.
- Become familiar with basic molecular techniques.
- Understand gene mapping and linkage analysis.
- Become conversant with the goals and accomplishments of the Human Genome Project.
- Recognize the importance of molecular methods in disease and forensic diagnosis.
- Have a sound knowledge of diagnostic approaches for common genetic disorders.

Course Requirements:

This course is designed for advanced students majoring in Biology, graduate students in genetics or genetic counseling, or students wishing to pursue a career in biomedical genetics/molecular biology. Prerequisite: General Genetics (BIOL 360). Students are required to attend class regularly, and participate in discussions. Prior permission is required in case of any absence from class for non-emergency reasons.

Method Of Evaluation: Various formats will be used to evaluate how well a student has grasped the subject:

Homework Assignments: There will be periodic assignments that must be completed on time to receive credit. Homework assignments are worth 20% of the final score.

Mid-term exams: There will be two mid-term exams, each accounting for 25 % of the score.

Final exam: There will be a closed book comprehensive final exam accounting for 30 % of the final score.

Grades will be based on total points earned:

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.

Fall 2007
BIOL 571 Class Schedule

	Date	Day	Topic	Reading
				Strachan & Read 3rd Edition
Part I: Fundamental Concepts				
Aug	23	R	Nucleic Acid & DNA Structure	1.1, 1.2
	28	T	Chromosome Structure & Function	2.1, 2.2, 2.4
	30	R	Genome Organization: RNA & Protein Coding Genes	9.1-9.3
Sept	4	T	Genome Organization: Non-Coding DNA	9.4, 9.5
	6	R	Regulation of Gene Expression	1.3-1.5, 10.1-10.6
	11	T	Pedigree Analysis	4.1-4.3
	13	R	<i>Review</i>	
	18	T	<i>Midterm I</i>	
Part II: Tools for Molecular Diagnosis				
	20	R	Restriction Endonucleases; DNA Cloning	Notes
	25	T	DNA Amplification; Polymerase Chain Reaction	5.1, 5.2
	27	R	Nucleic Acid Hybridizations: Principles	6.1, 6.2
Oct.	2	T	Nucleic Acid Hybridizations: Applications	6.3, 6.4
	4	R	DNA Sequencing & Genotyping	7.1, 7.2
	9	T	Physical Mapping of the Genome	Notes
	11	R	Human Genome Project	8.1-8.3
	16	T	Genetic Mapping	13.1-13.2
	18	R	Linkage Analysis	13.3-13.4
	23	T	<i>Review</i>	
	25	R	<i>Midterm II</i>	
Part III: Molecular & Genetic Basis of Disease				
	30	T	Genomic Instability & Mutations	11.1, 11.2
Nov.	1	R	Mutations: Mechanisms	11.3-11.5
	6	T	Mutations: Pathology-I	16.1-16.6
	8	R	Mutations: Pathology-II	2.5, 16.8
Part IV: Molecular Diagnostic Applications				
	13	T	Genetic Testing: Principles and Practice	Notes
	15	R	Applications of DNA Testing	Notes
	20	T	DNA Testing Methodology	18.1-18.3
	22	R	Diagnosis of Inherited Diseases-I	18.4-18.7
	27	T	Diagnosis of Inherited Diseases-II	18.4-18.7
	29	R	Diagnosis of Pathological Conditions	Notes
Dec.	4	T	<i>Review</i>	
	6	R	<i>Review</i>	
	13	R	<i>Final Exam</i>	