

Instructor: Dr. Gregorio Santillan
Office Hours: Mon, Wed, Fri 11:00 am-12:30 pm,
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Prerequisite: "C" or better in Chemistry 431 B

Text: Lehninger Principles of Biochemistry, 4th edition (2005), by D. Nelson and M. Cox. (W. H. Freeman and Co.) A web site with additional materials is available at bcs.whfreeman.com/lehninger. This web site contains online quizzes, animations, "living graphs", and molecular structure tutorials. The online quizzes are useful for self testing but will not be used for grading purposes. You are also expected to access the department website: www.calstatela.edu/dept/chem/class-notes.htm or www.calstatela.edu/dept/chem/09fall/431c.

Course objectives: This syllabus briefly summarizes the third quarter of a year long series in biochemistry. The main topics for this quarter involves nucleotides, nucleic acids, the molecular and cellular mechanisms involving DNA and protein synthesis.

Upon successful completion of this course, students will know the structural features of genetic information including: the organization of the gene, interpretation of nucleotide sequences, role of genomics. Students are to know how proteins function in DNA replication, repair and recombination. They will understand how the process of transcription and the controls for gene expression, how proteins and RNA read and translate genetic information into proteins. They will know how protein amino acid sequences are read to direct newly synthesized proteins to different parts of the cell. It is expected that students will gain practice in reading and critically evaluating original research articles.

Grades for the course will be based on a total of 200 points distributed as follows:

online quizzes (6 pts x 7 chapters)	40 pts
class performance/research paper report	50
Weekly quizzes (10 pts x 8 quizzes)	80 pts
2 Midterm Exams	180 pts
Final exam	<u>150 pts</u>
Total:	500 points

Letter grades will be assigned with "+" or "-" this quarter based on the following approximate scale:
90%+ = "A", 80%+ = "B", 60%+ = "C", 50%+ = D

No make up exams or make up quizzes are given. Absences during an exam are to be avoided at all costs. Emergencies must be documented and verifiable. Being unprepared for an exam is not considered an emergency. Anticipated problems should be discussed with the instructor before the exam not after. Serious infractions during an exam will merit a zero for that exam will be dealt with in adherence to the policies of the university. Homework will be assigned on a weekly basis and will be due on the same date as the quizzes. However, homework will not be collected but will serve as review.

There will be **weekly 10-point quizzes** (usually on Fridays at 11:40-12 noon) starting the first week. Students are required to bring a blue book to class for the quiz before April 3. Quizzes will be given at the very start of class and will last 10 minutes. Lateness will not be accomodated.

The tentative **schedule of topics** for the Fall Quarter is given below:

Week	Main topic	Chapter
1	Nucleotides & nucleic acids review	8
2	Nucleotide synthesis and catabolism	22
3	Genes and chromosomes	24
4	Test #1 DNA metabolism: replication	25
5	replication.	25
6	RNA metabolism: transcription	26
7	Protein metabolism: translation	27
8	Test #2 Regulation of gene expression	28
9	Regulation of gene expression	28
10	DNA-based technology	9

Suggestions for this class:

Students are to spend 2-4 hours per lecture hour – half before class and half after, reviewing the notes for that lecture. It is expected that students come to class prepared for discussion. Chronic lack of preparation will result in a student receiving a low class performance grade. If there are any special projects – such as summaries of research papers, these will be incorporated in this performance grade. To assist the student to come prepared, a detailed lecture schedule is included in this syllabus.

Quizzes will be based on your understanding of the chapter for that week – including material to be discussed that day. Questions at the end of each chapter are fair game and may be asked in the quiz. It is suggested that students go over each problem and their answers before the quiz.

More detailed schedule and reading assignment for students. We will do our best to stick to this schedule.

Lec #	Date	Topic	Text to Study	Other/week#
1	25-Sep	Introduction (FURLOUGH)	syllabus	
2	28-Sep	Basics of nucleotides, nucleic acids	8.1-8.2	1
3	30-Sep	nucleic acid chem and phy chem	8.3	
4	2-Oct	Other functions of nucleotides	8.4	
5	5-Oct	Nitrogen metabolism	22.1	2
6	7-Oct	amino acid synthesis	22.2	
7	9-Oct	Biosynth/degradaton of nucleotides	22.4	
8	12-Oct	chromosomal elements	24.1	3
9	14-Oct	DNA supercoiling	24.2	
10	16-Oct	CAMPUS CLOSED (FURLOUGH)	24.3	
11	19-Oct	Chromosome structure /DNA replication	25.1	4
12	21-Oct	DNA replication	25.1	
13	23-Oct	Midterm Exam #1 (FURLOUGH)		Test 1
14	26-Oct	DNA repair	25.2	5
15	28-Oct	DNA repair/recombination	25.2,25.3	
16	30-Oct	DNA recombination	25.3	
17	2-Nov	DNA-dependent DNA synthesis	26.1	6
18	4-Nov	DNA-dependent DNA synthesis	26.1	
19	6-Nov	RNA processing	26.2	
20	9-Nov	RNA-dependent DNA synthesis	26.3	7
	11-Nov	Veterans Day Holiday	27.1	
21	13-Nov	Protein-metabolism:Genetic Code	27.2	
22	16-Nov	protein synthesis	27.2	8
23	18-Nov	protein synthesis/ protein targeting & degradation	27.3	
24	20-Nov	CAMPUS CLOSED (FURLOUGH)		
25	23-Nov	Midterm Exam #2 (FURLOUGH)		Test 2
26	25-Nov	Principles of gene regulation	28.1	9
	27-Nov	Thanksgiving Holiday	28.2	
27	30-Nov	Gene regulation in prokaryotes	28.3	
29	2-Dec	Gene regulation in eukaryotes	9.1, 9.2	10
30	4-Dec	DNA cloning; PCR	9.3	