

THE CITY COLLEGE OF NEW YORK  
Department of Chemistry

Chemistry 45902

Lecture Schedule

Fall 2010

Professor Sacha De Carlo

Monday, Wednesday 4:30-5:45 PM Room MR-2

**Textbook:** Nelson and Cox, Lehninger "Principles of Biochemistry", Freeman & Co. 2008 5<sup>th</sup> Ed.

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Date	Chapter	Suggested Problems
Aug 30 M	1-2 Intro, Cells	(Cpt 1) 7, 8, 11, 12, 13
Sep 01 W	1-2 Cells, water	(Cpt 2) 4, 17, 21, 24, 25, 28
06 M	<i>No Classes (Labor Day)</i>	
08 W	3 Amino acids, peptides, proteins	1-3, 5, 6, 9-11, 19
13 M	4 3-D Protein Structure	1, 2, 4-10
15 W	5 Protein Function	1-6
20 M	6 Enzymes	1, 3, 4, 6-13, 19
22 W	7 Carbohydrates	1, 2, 10, 12, 13
27 T	<b>EXAM I (Cpt 1-7)</b>	
29 W	8 Nucleic Acids	2, 7, 12-14
Oct 04 M	9 DNA-Based Technologies	1-10
06 W	10 Lipids	2, 4-7, 18-22
11 M	<i>No Classes (Columbus Day)</i>	
13 W	11 Biological Membranes	2, 4, 6-8, 11-15, 17-19
19 W	13 BioEnergetics	2, 3, 4, 5, 6, 7, 10, 12, 14, 22
20 M	<b>EXAM II (Cpt 8-13)</b>	
25 W	14 Glycolysis	1-4, 7, 12, 16, 19, 22
Nov 01 M	15 Glucose Metabolism regulation	1-7, 15
03 W	16 Citric Acid Cycle	2, 4, 6-7, 10, 13
08 M	17 Fatty Acids Catalysis	
10 W	18 Amino Acid Oxidation	
15 M	19 P1-Oxydative Phosphorylation	1-3, 6-7, 9, 11, 13, 15-17
17 W	19 P2-Photosynthesis	
22 M	<b>EXAM III (Cpt 14-21)</b>	
24 W	24 Genes and Chromosomes	1-4
29 M	25 DNA Replication and Repair	1-3, 5, 8, 10
Dec 01 W	25 DNA Recombination	
06 M	26 RNA Transcription and Processing	1-4, 7, 8, 10, 12
08 W	27 Protein Metabolism	1-8, 14
13 M	28 Gene expression regulation	
21 W	<b>EXAM IV (Cpt 22 -28)</b>	

**Instructor:** Prof. S. De Carlo (212-650-6070),

[sdecarlo@ccny.cuny.edu](mailto:sdecarlo@ccny.cuny.edu)

Marshak Science Building, Office 1335, Lab 1321

**Office hours:** M, W 3-4:30 PM, Room 1335/1321

**Class outcomes:** the student will learn the basics of modern biochemistry and will be given the basic concepts necessary to pursue a career in biomedical sciences, grad school with emphasis on biochemistry, as well as a thorough preparation for medical/dentistry and veterinary school.

The first part of this course introduces the student to the basic building blocks of the cellular components, such as amino acids, nucleic acids, sugars and their assemblies commonly found in the cell.

The second part of the course focuses on the cell metabolism. The biosynthesis and catalysis of important metabolites is discussed in several chapters. The cell respiration is the central theme, and it will be presented in a sequential way (glycolysis, citric acid cycle, oxidative phosphorylation). Photosynthesis will be covered as well.

The third part of this course will introduce the student to the detailed mechanisms of gene expression. Topics will cover the structure of chromatin, DNA topology, replication and recombination of DNA, as well as DNA repair mechanisms.

The mechanisms will be presented in extensive details. Whenever possible the instructor will emphasize on the importance of biological assemblies, their structure, their interactions and the energetics aspects of the complex macromolecular processes they control.

**Teaching & Learning:** the instructor will use mainly powerpoint slideshows that will be distributed on BlackBoard ahead of the class. The powerpoint file will include complex graphics from actual research papers and movies/animations that will help the student to visualize complex cellular machines in action.

The instructor strongly urges the students to download the lecture and use the internet to search for additional information such as animations as well as browsing the protein data bank databases.

Each chapter has a series of suggested problems. The instructor strongly encourages the students to take sufficient time to form study groups and solve the suggested problems as well as all the other problems. This will help the understanding of complex topics tremendously.

Although not officially required by the Chemistry Department, the instructor suggests that the students review their concepts of thermodynamics and physical chemistry before taking the tests.

**General policies:** the instructor will be available during office hours to discuss topics and problems. If the student cannot attend office hours, an appointment can be required by email with at least 48 hours notice.

**Exams and Grading:** Final grades will be computed as average of the four exams scores. Exam IV is the final. Missing an exam without a valid justification will result in an automatic 0 (zero) for the missed exam. Only scientific calculators will be admitted at the exam. Portable devices with internet access, phones, and alphanumeric calculators (where text can be stored) are not allowed during exams and will result in an automatic F grade if used during the exam.

For all other policies, refer to the City College Undergraduate Bulletin 2007-2009, found here: <http://www1.ccny.cuny.edu/CCNYBulletin/>