

Introduction to Biochemistry Chem-527 (Spring 2012)

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Office Hours: Unless otherwise noted in 204 DRAKE HALL (immediately opposite the elevator on 2nd floor)

3:30-4:30 PM Tuesdays and 6:30 -7:30 PM Thursdays

Please note: Out-of-class exams for sections 010 and 011 (taken from the catalog) "CHEM 527 SECTIONS 010 AND 011 WILL BE EXAMINED ON COMMON DATES: SATURDAYS, MAR. 10 AND APR. 21 FROM 9:00 AM -12:00 PM. NO EXCEPTIONS WILL BE MADE.."

<u>Examination</u>	<u>Date</u>	<u>% of Grade</u>
Exam 1	Saturday, March 10	30
Exam 2	Saturday, April 21	30
Final Exam	Final's Week	40

There will be no make-up examinations. Medical excuses require a note from your doctor (for excused absences on Exams 1 and 2, your score on the final will be prorated to cover that 30% of your grade).

Text: Lehninger Principles of Biochemistry 5th Edition (Nelson, D.L. and Cox, M.M.). Worth Publishers.

Publisher's web site at: www.worthpublishers.com/lehninger has useful information and links

A tentative outline of major topics is listed here. Please note that we cannot cover the whole of the book. I will direct you to what I think is important as we progress. In the past my tests usually come from, or are inspired by, material covered in class. I anticipate that coming to class will be advantageous.

Tentative reading order:

Chapters 1:	An introduction to molecular logic, cells and biomolecules (a review of some basic chemical concepts). This is a support chapters for background and/or review.
Chapter 2:	Water
Chapters 3-5:	Amino acids through protein structure and function
Chapter 6:	Enzymes
Chapter 7:	Carbohydrates
Chapters 10-11	Lipids and Membranes
Chapter 13 + Part II	Bioenergetics
Chapter 14/15	Glycolysis
Chapter 16	Citric acid cycle
Chapter 17	Fatty acid oxidation
Chapter 19	Oxidative phosphorylation
Chapters 20-22	Some topics in biosynthesis
Chapter 24 + 8	Genes and Chromosomes

Grading: The distribution of grades averaged over the last few years:

(A/A-) totalled 23%; (all B grades) 35%; (all Cs) 37%; (all Ds and Fs) 5%. The average grade on the three exams was 61% (highest avg. grade was 95%). Please consider these statistics in judging your prospects. A part of each exam tests the application of concepts we cover in the course to material you may never have encountered. The course is graded on the curve and, given a comparable class, we expect a similar distribution of grades. To give you an idea what to expect a sample of exams will be included on the Website. Note that metabolic charts will be included where appropriate.

Please also note that biochemistry is “CHEMISTRY brought to life” and there are chemistry prerequisites for this course.

Extra stuff: I will regularly post a brief synopsis on the Webpage together with readings and announcements and extra material as appropriate.

Good luck.

Learning Goals

We are now expected to post learning objectives for the courses we teach.

Here are the main ones for this version of CHEM527:

An understanding of the structure of biomolecules (including amino acids, peptides, proteins, carbohydrates, lipids and nucleic acids): their main interactions in the cellular milieu, and how their structures are stabilized by covalent and non-covalent forces.

An understanding of the chemical reactivity of biomolecules, with particular emphasis on amino acids, peptides, and proteins.

A demonstrated understanding of the catalytic prowess of enzymes: their kinetic behaviors, how they respond to changes in environmental conditions, and how their activity can be modulated in vivo and in vitro by natural and synthetic compounds.

A working knowledge of the basic links between kinetics and thermodynamics: the role of thermodynamics in shaping metabolism and the trajectory of life.

A chemical understanding of central aspects of the following metabolic pathways: glycolysis, tricarboxylic acid cycle, fatty acid oxidation, oxidative phosphorylation, amino acid catabolism; and the biosynthetic pathways for carbohydrates and lipids. The ability to integrate this knowledge between pathways.

An understanding of the basic principles of information transfer in cells, including the mechanisms of replication, transcription and translation.

Generally, the student is expected to learn to apply, and integrate, material covered in this course so as to be able to predict the outcome of biochemical situations not necessarily covered in lecture.