

Chemistry 414-02 - Biochemistry Spring 2012

When and where: MWF 10 AM in Blow Hall 331

Instructor: Lisa M. Landino Ph.D.

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Office Hours: Tuesday 2:00-3:00 PM, Wednesday 2:30-3:30 PM and by appointment

Course Objectives: The primary objective of this course is to introduce students to the chemistry of living organisms. The course will examine the structures and functions of key biological macromolecules including proteins, lipids and DNA. Metabolic pathways, in particular those that use carbohydrates and fats as reactants (and sources of energy) will be studied in the context of enzyme mechanisms, thermodynamics and reaction kinetics. Some discussion of diseases resulting from changes in metabolism including diabetes and cancer will be incorporated. This section is geared toward those students who are majoring in the physical sciences. 3 hrs. lecture.

Required Text: Trudy McKee and James R. McKee Biochemistry Fourth Edition, Oxford University Press. This is the only text for the course and will be a valuable resource for those who plan to attend graduate or medical school. **Text web address:** www.oup.com/us/mckee

Exams and Grades Your final grade will be based on a possible total of 100 points distributed as follows:

Problem sets	(4 x 3.75 points each)	15 points
Exam 1		20 points
Exam 2		20 points
Take home exam		15 points
Final Lecture Exam		30 points

Mid-semester exams Two exams will be in class, closed-book exams. A third exam will be take-home, open-book and you will have one full week to complete it. Should there be a change in scheduling, this will be announced at least 1 week in advance of the actual exam. If you need to reschedule a mid-semester exam, please contact me *BEFORE* the exam.

Final Exam: The final exam will be **Monday, May 7th 2:00 – 5:00 PM in Blow 331**. The final will be cumulative; however, chapters 17-19 will be more heavily weighted.

Letter grades will be determined according to the following standard scale:

Grade Average

A	93.0 - 100	Final course averages will be determined for each member of the class and then those averages will be used to generate a class mean. If the class mean falls at or above 83%, grades will be assigned based on the scale shown. If the class average is below 83%, then an adjustment of the class mean may be made at the instructor's discretion and all individual grades will be adjusted UP in an equivalent manner. No grades will be adjusted down.
A-	90.0 - 92.9	
B+	87.0 - 89.9	
B	83.0 - 86.9	
B-	80.0 - 82.9	
C+	77.0 - 79.9	
C	73.0 - 76.9	
C-	70.0 - 72.9	
D	55.0 - 69.9	
F	< 55	

Problem Sets: Four graded problem sets will be assigned during the semester. Problem sets will be distributed in class or posted on Blackboard at least 1 week before the due date. There will be several exam-style questions to answer AND either 1) a short reading assignment with separate questions OR 2) a case study. Late assignments will incur a 10% deduction per day (24 hour period). Please attempt to do these assignments on your own; however, for problem sets, if you do work on a problem or problems with a classmate, *please write the names of the other students clearly at the top of your problem set before turning it in.*

Tentative due dates for all assignments are included in the table below. **Assignments are due at the beginning of class unless otherwise noted.**

Week	Class reading from text book
1/18-1/20	Ch. 1 & 2 pp. 1-69; start Ch. 3 – water and noncovalent interactions
1/23-1/27	more about water and noncovalent interactions pp. 73-100; Ch. 4 – Energy pp. 104-120
1/30-2/3	Ch. 5 – amino acids, peptides and proteins pp. 123-152 PS #1 due 2/3/12
2/6-2/10	last of proteins in Ch. 5 pp. 153-172; Ch. 6 – enzyme basics and kinetics pp. 184-202
2/13-2/17	Ch. 6 – enzyme catalysis & regulation pp. 202-222; Ch. 7 – carbohydrates pp. 227-259 PS #2 due 2/17/12
2/20-2/24	Exam 1 Monday 2/20/12 on Chapters 3-6 Ch. 8 – glycolysis pp. 264-280
2/27-3/2	Ch. 8 – gluconeogenesis pp. 282-289; Ch. 8 - glycogen metabolism pp. 296-303
3/5-3/9	Spring Break
3/12-3/16	pentose phosphate pathway pp. 290-293 and Ch. 8 regulation; Ch. 9 – TCA cycle pp. 306-335
3/19-3/23	Ch. 10 - electron transport pp. 338-357 Ch. 10 – reactive oxygen species pp. 357-367; Ch. 11 – overview of lipids and membranes PS #3 due 3/21/12
3/26-3/30	Exam 2 Monday 3/26/12 on Chapters 7-10 Ch. 12 - lipid metabolism pp. 415-436
4/2-4/6	Ch. 12 lipids and prostaglandins pp. 437-463; Ch. 15.2 amino acid catabolism pp. 562-577; overview of Ch. 16 - integration of metabolism
4/9-4/13	Ch. 17 - Nucleic acids – chemistry and physical properties Exam 3* due 4/11/12
4/16-4/20	Ch. 18 – DNA replication and repair; Ch. 18 – Transcription and gene expression
4/23-4/27	Ch. 19 – protein expression & class summary PS #4 due 4/25/12

*Take home exam on Chapters 11, 12, 15.2, 16 – due on April 11th.

Final Exam: Monday, May 7th, 2-5 PM in Blow 331