

CHEM 326: BIOCHEMISTRY LECTURE Fall 2009

INSTRUCTOR: Dr. Sandra L. Turchi
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Web site: <http://muweb.millersville.edu/~chem/turchi.html>
On the web site you will find:

1. One complete set of previous exams
2. The course objectives

Office Hours: MWF 9:00 to 10:00; T 9:00-11:00 others by appointment

LECTURE PERIODS: MWF 10:00– 10:50 in Roddy 149.

EXAMS Lecture exams are indicated in the syllabus below.

PREREQUISITE: CHEM 232 or CHEM 235

TEXT: Suggested Text:

- Horton et al. Principles of Biochemistry, 4th edition, ISBN: 0-13-145306-8
- Lab text: Supplied by the Department
- Goggles and lab notebook are to be purchased by the student

The laboratory text is an internal publication.

You will need a bound notebook for lab and goggles.

Other Text you can use for lecture include:

Campbell & Farrell; Biochemistry, 4th edition
Garrett and Grisham; Biochemistry, any edition.

Important Biochemistry web sites:

1. <http://www.indstate.edu/thcme/mwking/home.html>
2. <http://www.biocarta.com/>
3. <http://www.gwu.edu/~mpb/index.html>

ATTENDANCE: Class attendance is strongly recommended. Exam questions are based primarily on the lecture material. Being in class gives everyone a 'heads-up' if changes in the lecture or lab schedule need to occur. Students are responsible for the material and assignments presented in class. Attendance is **mandatory** for exams. Make-up work is to be arranged by the student with the instructor. If an absence is anticipated, work that will be missed must be done **in advance**. No work may be made up without an official excused absence; infirmity excuse will NOT be accepted. Excused absences include participation in an athletic event or class trip, military duty, death or critical illness in the family, or personal illness in which a physician indicates that you were too ill to attend class. A request for an excused absence should include a written justification for the reason for the absence and be signed by the appropriate individual (coach, faculty member, physician, etc). Except for death or illness, requests for an excused absence must be presented before the anticipated absence. Only valid excuses will be accepted to make up any missed assignments. Departure times for travel are NOT valid excuses. Make your travel arrangements accordingly. **Work not made up within one week from your return to class automatically receives a zero.**

CLASSROOM ETIQUETTE: Socializing and talking in class is rude and unfair to your peers interested in learning and hearing the lecture. If you persist in talking I will ask you to leave. I reserve the right to take disruptive behavior such as, habitual tardiness, frequent or excessive talking during class, cell phone disruptions or leaving before class has ended into account when determining your final grade. **Please set**

your cell phone on vibration mode during class. If you are expecting an important or emergency phone call sit in the front of the lecture room so that you can leave with minimum disturbance to your peers.

LEARNING DISABILITIES AND SPECIAL SENSATIVITIES: If you believe you have a learning disability, you may provide documentation to the Office of Student Support Services in Lyle Hall. I will be notified and appropriate accommodations will be made for you. If you have a condition that may affect your ability to perform a laboratory exercise (for example, allergies, pregnancy, chemical sensitivity), impede your exit from a lab in an emergency situation, or may cause an emergency during lab or class, please discuss this with your instructor and someone at the Office of Student Support Services.

ACADENIC HONESTY AND DISHONESTY: Familiarize yourself with the University policy on academic honesty and dishonesty as outlined in the MU student handbook and University brochure on the same. The content of these two documents applies to this course. Cheating of any form will not be tolerated. You and the person from whom you copy will both receive an “F” in that exam or assignment. Even though you work with a partner in lab and use the same collected data, each of you must write his/her own lab report. Although you may work on the problems together your answers should not be identical.

OBJECTIVES:

The student should be able to demonstrate that he/she

- Integrates their understandings of biology and chemistry at the molecular, cellular and organismal levels,
- Comprehends the concept of biomolecules, their structures, and their structure/function relationships in the aqueous, compartmentalized cell;
- Is capable of analyzing, interpreting, and predicting molecular events from quantitative expressions;
- Knows the pathways of intermediary metabolism as well as their regulation and their integration under various metabolic scenarios;
- Develops the technical and intellectual skills necessary to facilitate creative problem solving,
- Develops the attitudes and values that foster a continuing discourse about science and its role our world.
- The Laboratory exercises are designed to:
 1. Enhance the students understanding of biochemical principles
 2. Provide realistic experiences in the practice of selected biochemical techniques

GRADING :	4 Exams	400 points
	Class participation (10 quizzes)	100points
	Final Exam	200 points
	<u>Total points for lab</u>	<u>260 points</u>
	Total points for course	860 points

You must have a passing grade in the lecture to count the lab grades into the total points for the course.

The grade distribution will be based on the following system:

94-100 = A	89-87 = B ⁺	79-77 = C ⁺	69-67 = D ⁺
93-90 = A ⁻	86-84 = B	76-74 = C	66-64 = D
	83-80 = B ⁻	73-70 = C ⁻	63-60 = D ⁻

TENTATIVE LECTURE SCHEDULE

UNIT	TOPIC	TEXT	Problems	EXAM
1	Introduction/cell	Chap. 1.2, 1.3,1.6, 1.8,1.9	NONE	
	Water/Buffers	Chap. 2 all sections	2-4,7-9,13,14,16	Exam 1 Fri, September 18 Unit 1
	Amino acids Peptides	Chap. 3 3.1-3.7	8,9	
	Proteins Myoglobin & Hemoglobin	Chap. 4.1,4.3-4.5,4.7B,C, 4.8-4.10,4.12,4.13	1,8,11,12	
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2	Enzymes	Chap. 5.1-5.3c,5.5, 5.7ACD,5-5.11	9a,15	Exam 2 Mon, October 19 Unit 2
	CoEnzymes	Chap. 7.2,7.4-7.12	1-3	
	Oxidative Phosphorylation	Chap. 10.9; 14.1-14.12	2	
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3	Carbohydrates	Chap.8.1-8.6A	1,5,7,12,13	Exam 3 Mon, November 16 Unit 3
	Glycolysis	Chap. 11 all sections	1,8	
	Glucconeogenesis; Glycogen metabolism; Hexose Mono- phosphate Shunt	Chap.12.1-12.3,12.4A,B, 12.5	1-4,6-8,10-13	
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4	Citric acid cycle	Chap. 12.1-12.6	3-5,7,8,10,15	Exam 4 Mon, Dec 14 Unit 4
	Removal of Nitrogen from Amino Acids;	Chap. 17.2A,B, 17.7	11	
	Urea Cycle			
	Lipids	Chap 9.1-9.4,9.6,9.7	1	
Lipid metabolism	Chap. 16.1A,B,C,D, 16.7A,B,C,D,16.11A	2,3a,6,7		
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CUMULATIVE FINAL Saturday Dec 19, at 8:00 A.M.

CHEM 326: BIOCHEMISTRY LABORATORY Fall 2009

INSTRUCTORS: Dr. Sandra L. Turchi and Dr. Aimee Miller

LABORATORY PERIODS: Labs are scheduled for Tuesday, Wednesday and Thursday each week in Caputo 225.

LABORATORY MANUAL: Internal publication. You must have goggles and a Quadra-ruled bound notebook.

OBJECTIVES: Students will conduct experiments that illustrate concepts and techniques associated with biochemistry. Techniques will include those important to synthesis, isolation, purification, analysis and characterization of biological molecules. The importance of biologically relevant small molecules and biomacromolecules will be stressed.

ATTENDANCE Make-up labs will not be given except under the most extreme conditions and only with *prior* arrangement with and approval by the instructor.

PUNCTUALITY The introduction for the lab is given during the first 15 minutes and includes important supplementary information and any modifications for performing the experiment as well as vital safety information. You should be in lab at the designated time not to miss any information.

PRELAB QUESTIONS Prelab questions for each experiment can be found at the beginning of each experiment in the lab book and **MUST** be completed **PRIOR** to the lab. They should part of the experimental write up for each lab. They should come before the formal lab write up in your lab notebook. You will not be able to begin lab until the prelab questions are completed. If you do not understand the questions, we will be happy to help you *before the morning of the laboratory period*.

LAB REPORTS EVALUATION: Evaluation of laboratory performance will be based on Lab notebooks. (13x10pts each). **Lab notebooks are to be handed in by 4 P.M. on the day after your lab session. No lab books will be accepted late unless prior permission has been given.**

POST LAB QUESTIONS Postlab questions are to turned in as part of your lab report.

GRADING FOR LABORATORY COMPONENT

Laboratory experiments reports	(13 x10pts)	130pts
Prelab questions	(13 x 5pts)	65pts
Postlab questions	(13 x 5pts)	65pts
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Total points for lab		260pts

Tentative Laboratory Schedule

<u>WEEK of</u>	<u>Experiment</u>
	Check-In and
August 25,26,27	Exp. #1: Use of Pipettors
September 1,2,3	Exp. #2: Spectrophotometry & Solution Chemistry
September 8,9,10	Exp. #3: Acids,Bases,pH,Buffers
September 15, 16,17	Exp. #4: Properties of Amino Acids
September 22,23,24	Exp. #5: Methods of Protein Measurements
Sept 29,30,Oct 1	Exp. # 6: Exclusion Chromatography
October 6,7,8	Exp. #7: Protein Electrophoresis
October 13,14,15	NO LAB: FALL BREAK
October 20,21,22,	Exp. #8: Western Blot
October 27,28,29	Exp. #8: Western Blot-Finish
November 3,4,5,	Exp. #9: Dialysis
November 10,11,12	Exp. #10: Enzyme Kinetics
November 17,18,19,	Exp. #11: Carbohydrates
November 24,25,26	NO LAB: THANKSGIVING BREAK
December 1,2,3	Exp. #12: Cellular Respiration
December 8,9,10	Exp. #13: Lipids: Soap Preparation

CHECK-OUT