

University of Detroit Mercy  
Department of Chemistry and Biochemistry

CHM 471/561      Biochemistry I      Term I, 2003-04      MWF 9-9:50

**Instructor:** Elizabeth S. Roberts-Kirchhoff, Ph.D.  
**Office:** McNichols Campus, Chem 107 (across from the vending machine)  
**Office Hours:** MW 1-3 PM or by appointment  
**Phone:** 993-1021  
**Email:** robkires@udmercy.edu  
**Text:** *Lehninger Principles of Biochemistry*, 3<sup>rd</sup> ed.; David Nelson and Michael Cox  
**Website:** CHM471\_01 on knowledge.udmercy.edu (password: \_\_\_\_\_)  
**Supplemental Text:** *The Absolute, Ultimate Guide to Lehninger Principles of Biochemistry*, 3<sup>rd</sup> ed.; M. Osgood and K. Ocorr (On reserve in the library)

### Course Objectives and Learning Outcomes:

This semester will cover the basic principles of proteins, carbohydrates, lipids, and nucleic acids as well as enzyme kinetics and bioenergetics. The student will have an understanding of fundamental macromolecular structures as well as kinetics and thermodynamics. This will prepare the student for metabolism and molecular biology in CHM 472. The objectives will be met through lectures, exams, and assignments.

**Prerequisites:** General Chemistry, Organic Chemistry.

### Grading:

Students who miss exams will receive no credit. Makeup exams will be only allowed in documented emergencies and at the convenience of the instructor. Homework assignments are due by 5 PM. Five points per day will be subtracted for late assignments. Quizzes are given each at 9:00 am each Friday. No makeup quizzes will be given, and the lowest two scores will be dropped. Student grades will be based upon:

Three exams	3 x 100	300 points	
homework assignments	2 x 25	50 points	
poster/presentation		70 points	
quizzes (8 out of 10)	8 x 10	80 points	
CHM 561 assignment		100 points	
Total number of points:		500 points (CHM 471)	600 points (CHM 561)

Letter grades will be distributed based upon the following percentages of total possible points:

93-100 = A	83-87 = B	73-77 = C	
90-92 = A-	80-82 = B-	70-72 = C-	<60 = F
88-89 = B+	78-79 = C+	60-69 = D	

### Exam/Assignment Schedule and Tentative Course Outline:

Monday	Tuesday	Wednesday	Thursday	Friday	S	S
1 <i>September</i>	2	3 Ch 1-4 Intro/pH	4	5 <b>QUIZ</b> Chapter 4 pH	6	7
8 Ch 5 Amino acids	9	10 Chapter 5	11	12 <b>QUIZ</b> Chapter 5	13	14
15 Ch 6 Protein Structure	16	<b>17 Meet in Eng. Computer Lab</b>	18	19 <b>QUIZ</b> Chapter 6	20	21
22 Ch 7 Protein Function	23	24 Chapter 7	25	26 <b>QUIZ</b> Chapter 7	27	28
29 Chapter 8 <b>Homework #1</b>	30	<b>1 Oct Meet in Eng.Computer Lab</b>	2	3 <b>EXAM 1</b>	4	5
6 Chapter 8	7	8 Chapter 8	9	10 <b>QUIZ</b> Chapter 8	11	12
13 Chapter 8	14	15 Chapter 8	16	17 <b>NO CLASS</b> <b>TECH DAY</b>	18	19
20 Chapter 8	21	22 Chapter 9	23	24 <b>QUIZ</b> Chapter 9 Carbohydrates	25	26
27 Chapter 10 Nucleotides	28	29 Chapter 11 Lipids	30	31 <b>QUIZ</b> Chapter 12 Membranes	1 <i>Nov</i>	2
3 Chapter 12	4	5 <b>EXAM 2</b>	6	7 <b>QUIZ</b> Chapter 14 Bioenergetics	8	9
10 Chapter 14	11	12 Chapter 14	13	14 <b>QUIZ</b> Chapter 15 Glycolysis	15	16
17 Chapter 15	18	19 Chapter 16 <b>Homework #2</b>	20	21 <b>QUIZ</b> Chapter 16 Citric Acid Cycle	22	23
24 Chapter 16	25	26 Chapter 19	27 <i>No School</i>	28 <i>No School</i>	29	30
1 <i>DEC</i> Ch 19 Ox. Phosphory	2	3 <b>POSTER SESSION</b>	4	5 Chapter 19	6	7
8	9	10 <b>EXAM #3</b> <b>8-9:50AM</b>	11	12	13	14

**Homework Assignments:**

During the semester, two homework assignments will be collected. Homework assignments are due by 5 PM. Five points per day will be subtracted for late assignments. I encourage students to work together on the homework. Other homework problems from your book will be assigned for each chapter. The reading assignments and suggested problems will be posted on the course website. These will not be collected but are an excellent way to check your mastery of the material from that chapter. Both the graded homework problems and the suggested problems from your book are potential test questions.

**Poster/Presentation Assignment:**

While working in groups of two, you will gather information about a protease and present it in a poster to the rest of the class. On the poster you will describe the protease's overall tertiary and quaternary structure, describe cofactors, highlight catalytically important residues, outline the reaction catalyzed, and outline the mechanism of catalysis. You are required to include some structure pictures generated by Protein Explorer (free software for visual exploration of macromolecular structure.) More detailed information will follow.

**Class cancellation policy:**

If a class is missed due to weather or instructor's absence, anything planned for that class will occur during the next class session.

**Extra Credit Policy:**

There may be opportunities to earn extra credit points (attending special lectures, etc). These will be described in class.

<b>Important Dates:</b>	September 9	Last day to add a class
	September 26	Last day to drop without a "W"
	October 21	Midterm grades due from faculty
	November 17	Last day to withdraw from class

**Student Responsibilities:**

1. Prepare for class by reading textbook and reviewing notes.
2. Attend all classes.
3. Do all suggested homework problems.
4. Get questions answered as soon as possible.

**Academic Integrity:**

Students are expected to conform to a high standard of honesty and integrity in this course. Please refer to the University Catalog and E&S student handbook for a further explanation of academic integrity. Everything submitted for grading (exams, homework, etc.) is expected to be a student's own work. Anything suspected otherwise will be dealt with according to University and E&S policies.

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Additional Assignment: 100 points

The objectives of this assignment are to:

- (1) gain exposure to current topics in the 2002-03 series of the *Journal of Biological Chemistry*
- (2) Recognize topics covered in Term I
- (3) Choose one article to critically read.
- (4) The article should be at least 4 pages and cover a topic discussed in Term I.
- (5) Write a report
- (6) Give an oral report

Written Report:

- (1) approximately 5 pages long
- (2) Discuss the experiments and methods presented and state what conclusions you drew from them. Discuss any problems encountered in the paper (poorly written, unclear, conclusions not supported with experimental evidence, etc).
- (3) The difficulty of the paper will be taken into account in the grading. Make a reasonable attempt at trying to gather background information including obtaining supporting articles, consulting other texts, meeting with the instructor.
- (4) Five points will be deducted for each day late.

Oral Report:

- (1) Meet during the week of Dec 2 for 50 minutes to discuss the paper.
- (2) Include an over view of the article discussing techniques, experiments, results and the conclusions that were given (approximately 30 minutes of oral report)
- (3) Be prepared to answer questions about the article.

Important Dates:

- (1) Choice of paper: October 24, 2003
- (2) Written Report Due: Wed, November 26, 2003
- (3) Oral Report: During the week of Dec 1-5, 2003

Grading:

Choice of paper	15 points	on time, topic covered in Term I
Written report	55 points	content and grammar/style
Oral Report	30 points	summary, ability to answer questions