

University of Detroit Mercy
Department of Chemistry and Biochemistry

CHM 470-M1/570-M1

Basic Biochemistry

Term II, 2003-04

MW 5:15-6:30 PM

Instructor: Elizabeth S. Roberts-Kirchhoff, Ph.D.

Office: McNichols Campus, Chem 107

Office Hours: MW 1-3 PM or by appointment

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Course Website: knowledge.udmercy.edu CHM470_570_01

Text: *Biochemistry*, 4th Edition, Campbell/Farrell

Supplemental Text: *Student Study Guide/Solutions Manual*, B. Morimoto

Materials: A scientific calculator that can perform logarithmic and exponential functions.

Course Description:

CHM 470/570 is an introduction to structure-function relationships of biomolecules, including amino acids, proteins, carbohydrates, lipids, and nucleic acids. Also included is an introduction to metabolism (glycolysis, the Krebs cycle and oxidative phosphorylation). Physiological applications of Biochemistry will be stressed.

Prerequisites:

General and Organic Chemistry

Course and General Education Objectives:

The following objectives will be met through lectures and homework assignments.

1. To acquire knowledge about biological macromolecules and metabolic pathways.
2. To apply quantitative methods in solving biochemical problems.
3. To demonstrate an understanding of some of the fundamental scientific concepts and theories in biochemistry.
4. To acquire knowledge of the evidence, ideas, and models that scientists use to make judgements about the natural world.
5. To develop the skills of logical and critical thinking necessary to explore how the natural world works.
6. To demonstrate an appreciation of the historical and contemporary impact of biochemistry and biochemical technology on daily life.

Important Dates: January 12
January 30
February 24
March 26

Last day to add a class
Last day to drop a class without a "W"
Mid-term grades due
Last day to withdraw from class

Tentative Course Outline and Exam Schedule:

Class Meeting	Date	Topic	Chapter
1	1/5 1/7	Introduction, pH	1-2
2	1/12 1/14	Amino acids/proteins	3-4
3	1/19 1/21	No Class Enzymes	5
4	1/26 1/28	Enzyme control Exam 1	
5	2/2 2/4	Lipids Membranes	6 7
6	2/9 2/11	Nucleic acids	8
7	2/16 2/18	Replication Transcription	9 10
8	2/23 2/25	Exam 2 Protein synthesis	11
	3/1, 3/3	Spring Break	
9	3/8 3/10	Bioenergetics	12
10	3/15 3/17	Carbohydrates Glycolysis	13 14
11	3/22 3/24	Exam 3 Storage	15
12	3/29 3/31	Citric Acid cycle Electron transport	16 17
13	4/5 4/7	Lipid Metabolism Metabolism of Nitrogen	18 20
14	4/12 4/14	Overview of Metabolism Presentations	21
15	4/19	Final Exam 5:00-6:50 PM	

(a) **Grading:** Each exam is worth 100 points and the project is worth 50 points.

Grades will be based upon the basis of total points (450 pts maximum for CHM 470; 500 pts maximum for CHM 570). Letter grades will be distributed based upon the following percentages:

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	

Exams

If you know ahead of time that you will miss an exam and have a valid and documented excuse, I will administer an exam before the regularly scheduled exam. If you have a question as to the grading of your exam, please see me outside of class to discuss this, and you must submit to me in writing the question you have concerning the grading including any pertinent information that I should consider when reviewing your concern.

Homework Assignments:

Homework assignments will be given throughout the term. Some exam questions will be drawn from these homework assignments.

CHM 470 and CHM 570 project (50 pts maximum)

Purpose: to investigate the structure function relationship in protein structure. You will work in groups of two for this project. You are to describe where a point mutation or loss/gain of a small region of a protein gives rise to a clinical disorder. You are to search the current literature to find a mutated protein (not sickle cell hemoglobin) that results in a disease. You might try the Online Mendelian Inheritance in Man site for ideas. You will hand in a 2-page summary and give a Powerpoint presentation to the class. You must include at least 1 reference from a refereed journal (not a web site). Please attach a copy of the key journal article(s) with your report. If possible include structure diagrams of the native and mutated conformations of the protein. (This can come from a journal article or from a web data base or protein structure database). Only one group can report on one protein. As groups choose proteins, I will post the list outside my office. The protein/disorder you wish to study should be approved **no later** that February 25, 2004. The reports are due and the presentations will be given on April 14, 2004

CHM 570 students:

Additional Project (50 pts maximum). Each person will be assigned a project related to clinical medicine. The problem will require some library work and the paper will be due April 16, 2003.

Attendance:

Students are expected to attend all classes.

Class cancellation policy:

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

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 Engineering and Science Student Handbook for further explanations of academic integrity.

The Department of Chemistry and Biochemistry has a cellular phone/pager policy. These units should be turned off prior to coming to class and usage of a cell phone, for calls other than emergencies, during class is prohibited. Students using a cell phone will be asked to leave for that day. Answering a cellular phone during an in class exam will result in a "0" for that exam.