



Course Syllabus

I. Basic Information:

CHE 319 Biochemistry

Fall 2009 4 Sem hours

Prerequisites: CHE 315, 325

Instructor: Dr. David Wing

Office White 335 Phone: 731-661-5957

Email: dwing@uu.edu

Office hours: M–F 9:00 – 10:00;

And during Lab meetings

Class meeting: MWF 11:00-11:50 WH312

Lab -1 Tu 1:40 – 4:30

-2 W 2:00 – 4:50

-3 Th 1:40 – 4:30

Your student email account XXX@uu.edu,

Is an official method of communication between you and me. You are responsible for information submitted to your email account. Such communication includes important information about classes, registration, and University events and deadlines.

II. Objectives:

Students who complete this course successfully will be able to:

1. Recognize structures and name the four types of biologically important compounds.
2. Predict trends in physical and chemical properties, and interpret biological function of biologically important molecules based on their knowledge of chemical structure.
3. Apply the quantitative relationships common to acid-base chemistry, enzyme kinetics and bioenergetics to the solution of numerical problems.
4. Be knowledgeable of in laboratory techniques used to study biochemical systems.
5. Observe the beauty and orderliness of God's creation of living systems at the molecular level.

III. Required Materials:

1. Text: Lehninger, Nelson, Cox Principles of Biochemistry, Fifth Edition (2008) WH Freeman and Co.
2. Chemistry 319 Labbook 2009 edition;
UU Chemistry Department
2. Laboratory notebook
3. Safety goggles
4. Alternative Text option: e-book edition: Principles of Biochemistry

IV. Method of Instruction:

Instruction in biochemistry is a combination of lecture, class discussion, project reports, and working homework assignments. The instructor will outline the material to be studied and will explain the concepts involved. It will then be the student's responsibility to utilize the text, supplementary materials, and individual effort to "fill in" the outline for study. It is very helpful to take notes in class, add details from the text after class discussion, work all assigned homework problems, and ask questions if there are areas which need clarification. I view my role as a coach-guide to point you in the right direction toward mastering the subject.

V. Method of Evaluation

Course grade will be determined by a combination of homework, in-class quizzes, hourly exams, and a final exam. Final exam for first semester will be comprehensive over the material covered first semester. FINAL EXAM FOR SECOND SEMESTER WILL BE COMPREHENSIVE OVER THE ENTIRE YEAR.

Grading Scale:

My grading scale starts out at 90/80/70/60/50 for A/B/C/D/F. I reserve the right to adjust this scale, but will not raise it. All A's or all F's are possible.

Distribution for credit of the various activities in this course are:

Hourly exams	= 50%	
Homework / quizzes	= 15%	
Average of lab reports	= 25%	
Final Exam	= 5%	Class
participation / project	= 5%	

Since lab is not a separate course, Your lab grade will be incorporated into the overall course grade. Lab assignments will count 25% of the total. Therefore it is VERY important that you give your best effort in both the classroom and laboratory portions of this class. Lab is evaluated on the basis of a weekly notebook, lab quizzes, and more formal reports for some experiments.

Special Projects:

1. Biochemistry history assignments:

- A. You are responsible for Chapter 1 in the text, AND three "History of Biochemistry" papers.
- B. Write a one page paper describing that earlier discovery in its historical context, then contrast that discovery with current knowledge. Analyze how the earlier discovery is the basis for current knowledge.
- C. Paper #1; prior to 1960
Paper #2; 1960 – 1990
Paper #3; 1990 – present
- D. You will need to look up additional resources, internet use is OK, (but NOT WIKI!) as long as proper references are included.

5. Be prepared to do 2 minute summary of your paper for the class;

Paper #1;	Sep 9
Paper #2;	Oct 19
Paper #3;	Nov 23

Research Paper report:

In order to create an awareness of current developments in the field of biochemistry, students are asked to complete a written summary of a research article. The summary should include all background information necessary for a peer group to comprehend the reported research as well as a concise overview of the experiment and results. All references should be cited. Student groups will be asked to review and analyze a paper from the literature according to a defined procedure, and present their analysis in lab the week of November 17th.

Academic Honesty:

The penalty for cheating (giving or receiving aid on a test, plagiarism on papers, etc. is an F in the course. The student will also be reported to the academic center as required by school policy

Attendance Policy:

Regular attendance of lecture and laboratory is expected of all students. Unexcused absence from an exam will result in a grade of zero. Make up exams for an excused absence will be given upon the student's return to class.

Note:

Important Dates:

*Experiments 2,3,4,5,6,8,9,&10 will be graded at 20 points each. Ten points will be awarded for the laboratory work and data recording. (Lab journals will be checked before the student leaves the lab). The remaining 10 points will be awarded for calculations, presentation of results, conclusions and a written abstract.

** A Formal Lab report will be required for this experiment , 30 points.

Course OutlineApproximate lecture and laboratory schedule

Date	Ch	Topic	Lab Week
Aug	1	Intro: Foundations of Biochemistry, cells & chemicals	1. Organic groups review
	1.3-1.4	Energy & Genetics	JMol exercises
Sep	2	Properties of Water	
	2	Acid-base balance	2. amino acid titration
		Labor Day	
	2	Buffers and perspective	buffer preparations
	3.1	Amino acids HISTORICAL PERSON BIO DUE	
	3.2	Peptide & Peptide bonds [AA structure quiz]	3. Concentration of a protein solution
	3.4	1° Protein structure	
	3.3	Working with proteins	
		Test; Ch 2,3	
	4.2	2° Protein structure	4. Protein structure tutorials
	4.3	3° Protein structure	PDB file structure
	4.3	4° Protein structure / interactions	5. Phycocyanin denaturation studies
	4.4	Protein denaturation and folding	
Oct	5.1	Oxygen binding proteins	
	5.2	TEST #2 Ch 4-5	
	6.1	Enzyme introduction	
	6.3	Enzyme kinetics FALL BREAK!!!	Off
	6.4	Chymotrypsin mechanism	7. Enzyme kinetics **
	6.5	Methods of enzyme regulation	
	6.2	Enzyme mechanisms	
		Test #3 Ch 6	8. Protein separations size and ion exchange chromatography
Nov	7.1	simple sugars 1 & 2 units	
	7.2	Polysaccharides REMEMBERANCE DAY	9. sugars by HPLC
	7.3	sugars + protein or lipids	
	7.4-7.5	the sugar code	
	8.1/8.4	Nucleotide structure & function(s)	Research paper presentations
	8.2	1° Nucleic acid structure	
	8.3	2°,3° Nucleic acid structure	
		TEST #4 Ch 7,8	
	10.1	Storage lipids	10. Cholesterol from egg yolk
	10.2	Structural lipids	
	10.3	Lipids are signals / cofactors / pigments	
	11.1	Membrane structure Thanksgiving	off
Dec	11.2	Membrane dynamics	
	11.3	Transport across membranes	
		Test #5 Ch 10 – 11	
		FINAL 2:00 – 4:00 PM	