# Biochemistry I
# CHEM 4320
# Syllabus
# Spring 2011

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**Instructor**
Dr. Melissa Kelley
201-A Laney
Phone: 501-450-5960
Email: mkelley@uca.edu
http://faculty.uca.edu/mkelley/

**Office Hours**
Monday: 1:00-3:00
Tuesdays: 9:00-11:00
Wednesday: 1:30-2:30
Appointments are also available.

**Class Meeting Time**
MWF 10:00-10:50 or 11:00-11:50 Laney 103

**Text**
Biochemistry 6th Edition, J.M. Berg, J.L. Tymoczko, and L. Stryer.(2006)

**Course Description and Objectives**
Biochemistry I is an intensive study of biomolecules and their properties including their structure, function, and metabolism. The objective of this course is for students to have an in-depth understanding of biomolecules including proteins, carbohydrates, nucleic acids, and lipids and their associated metabolism including bioenergetics and synthesis.

**Course Prerequisites**
Prerequisite: successful completion of CHEM 3411. This course will require students to understand basic concepts from general chemistry and organic chemistry. These topics include but are not limited to: acid/base chemistry, shapes of molecules, organic functional groups and their reactions, oxidation/reduction reactions, thermodynamics, and equilibrium.

**How to be successful in this course**

1. **Attend lecture.** Students who do not attend lecture will not be successful in this course. Many of the topics I cover will not be presented in the book. You are responsible for the material covered in class and the reading assignments. Attending class is highly recommended.
2. **Study time.** I recommend you devote between two and three hours per lecture study time. I recommend you identify two or three other classmates to study with, asking questions, and using the textbook as a guide.
3. **Biochemistry is a field that requires you to practice and think.** Biochemistry follows the same scientific laws that you have already learned and it is the application of these scientific laws to biological systems. Biochemistry is not a spectator sport and to be successful it requires hard work and lots of practice.
4. **Ask questions.** If you do not understand the concepts I have presented in lecture ask. Biochemistry is a science in which one concept is built on another. Please do not be embarrassed, there is no such thing as a stupid question. Stupidity lies in not asking. Please

feel free to stop me in lecture with a question or if you would prefer stop by my office during office hours and ask.

5. **Be an interactive learner.** Ask questions and participate in class discussions. This is an excellent way to understand the material and hopefully you find many of the topics we cover are applicable to your life and your future career.

**What do I expect you to know and understand?**

Everything we talk about in class. **To earn an A, memorization is not enough.** Test questions will require you to apply the principles we have discussed in class and are problems which you have not encountered before. I care more that you understand structures and pathways than that you memorize them.

**Grading**

4 Exams at 100 points each= 400 points
1 Final exam (comprehensive) = 200 points
Minireview project = 100 points
Student written case study = 100 points
Instructor written case study = 100 points
Unannounced Quizzes = 0-50 points

Total points=900-950 points

**Grading Scale**

A: 90%
B: 80%
C: 70%
D: 60%
F: 50%

**Minireview Project**

You will have an opportunity to write a minireview article in this course. A biochemical topic will be assigned to each student and the student will write a minireview article over that particular topic. The objective of these review articles is for the student to have an opportunity to research current biochemical literature and write a concise and comprehensive review of the current thinking in biochemistry. Minireviews must be submitted electronically by email. Minireviews will not be accepted late.

**Student Written Case Studies**

Students will also be required to write a case study based on their minireview project. Your case study will also include explanation of the case study and biochemical relevance. Student written case studies must be submitted electronically by email. Case studies will not be accepted late.

**Instructor Written Case Study**

You will have an opportunity to examine and diagnosis a metabolic disease. Each student will be required to explain biochemically all the symptoms of the metabolic disease and recommendations for treatment. The student will submit a summary of the symptoms, their biochemical significance, and their diagnosis for treatment. Case studies will not be accepted late.

**Unannounced Quizzes**
Quizzes may be given at the discretion of the instructor. The quizzes are intended to prepare you for upcoming exams.

**Missed Exams**
A missed exam will be made up at my discretion. If you miss an exam for a **valid and significant reason**, and you contact me either through email or phone **before** the schedule exam, then we can discuss the possibilities of a make-up exam. If you contact me after the exam, no make-up will be given. I strongly suggest that you make every effort to attend exams. Tardiness to an exam is discouraged.

**Academic Honesty**
Cheating or representing someone else's work as your own is **severely discouraged**. The penalties for cheating are severe and include, but are not limited to, assigning an "F" for the work and/or the course to expulsion from the University. The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

**UCA Policies**
Students are encouraged to familiarize themselves with all the policies listed in the UCA Student Handbook. Students should pay particular attention to the Academic Policy on page 23 and the Sexual Harassment Policy on page 93.

**Americans with Disabilities**
The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need accommodations under this Act due to a disability, please contact the UCA office of Disabilities Services, 450-3135.

## Lecture Schedule with Appropriate Book Chapters

***This is a tentative schedule-all dates and contents are subject to change**

| Date | Topic | Chapter | Pages |
|---|---|---|---|
| Jan 14 | Introduction | | |
| **Jan 17** | **No Class-MLK Holiday** | | |
| Jan 19 | Introduction | 1 | 1-11, 14-17 |
| Jan 21 | " | | |
| Jan 24 | Protein Structure and Function | 2 | 25-60 |
| Jan 26 | " | | |
| Jan 28 | "<br>Exploring Proteins | 3 | 65-103 |
| Jan 31 | " | | |
| Feb 2 | "<br>Enzymes Basic Concepts and Design | 8 | 205-236 |
| Feb 4 | " | | |
| Feb 7 | "<br>Catalytic Strategies | 9 | 241-272 |
| **Feb 9** | **EXAM 1** | | **EXAM 1** |
| Feb 11 | "<br>Regulatory Strategies | 7<br>10 | 183-198<br>303-322 |
| Feb 14 | " | | |
| Feb 16 | Carbohydrates | 11 | 295-318 |
| Feb 18 | " | | |
| Feb 21 | Metabolism: Basic Concepts and Design | 15 | 409-429 |
| Feb 23 | " | 15 | 409-429 |
| Feb 25 | **EXAM 2** | | **EXAM 2** |
| Feb 28 | " | | |
| Mar 2 | "<br>Glycolysis and Gluconeogenesis | 16 | 433-470 |
| Mar 4 | " | | |
| Mar 7 | " | | |
| Mar 9 | "<br>Glycogen Metabolism | 21 | 592-614 |
| Mar 11 | "<br>Pentose Phosphate Pathway | 20 | 577-585 |
| Mar 14 | **EXAM 3** | | **EXAM 3** |
| Mar 16 | Citric Acid Cycle | 17 | 475-498<br>**Minireview Due** |
| Mar 18 | Oxidative Phosphorylation | 18 | 502-536 |

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|---|---|---|---|
| | Lipids and Cell Membranes | 12 | 326-348 |
| **Mar 21-25** | **Spring Break!!!** | | |
| Mar 28 | " | 12 | 326-348 |
| Mar 30 | Fatty Acid Metabolism | 22 | 617-646 |
| April 1 | " | | |
| April 4 | " | | |
| April 6 | " | | |
| Aprl 8 | Amino Acid Metabolism. | 23 | 649-667 |
| Apr 11 | " | | |
| Apr 13 | Integration of Metabolism | 27 | **760-780** |
| Apr 15 | " | | |
| **Apr 18** | **EXAM 4** | | **EXAM 4** |
| Apr 20 | Genetic Information | 28 | 783-816 |
| Apr 22 | " | | **Case Studies Due** |
| Apr 25 | " | | |
| Apr 27 | Review | | |
| **April 29** | **No Class-Study Day** | | |
| **May 2** | **FINAL EXAM 8:00-10:00 (10:00 Class)**<br>**FINAL EXAM 2:00-4:00 (11:00 Class)** | | **FINAL EXAM** |