

**Biochemistry**  
**Chemistry 4711**  
**Fall 2007**

Lecture: 9:00 - 9:50 MWF  
Instructor: Dr. John E. Hansen  
Office: Chemistry 2126; Phone: 678 839-2106; email: jhansen@westga.edu  
Office Hrs: 9:50 - 1:30 M,W; 11:00 – 1:40 T  
Text: Lehninger Principles of Biochemistry, 4th Edition by Nelson and Cox

**Course Objectives**

CHM 4711/5611 is a semester-long biochemistry course designed for chemistry, premed and pre dental students. Material covered during this course includes structure and function of proteins, enzyme kinetics, carbohydrates, lipids, nucleic acids and intermediary metabolism. Lectures will follow the first 21 chapters of the text. However, material will be covered in lectures to augment that in the text. You will be responsible for material covered in both lectures and text.

**Learning Outcomes**

In this course, students will develop an understanding of the chemical basis for biological systems. They will demonstrate their understanding of the physical properties of biopolymers, complex interactions between biomolecules, enzyme kinetics, and the chemistry and regulation of metabolic pathways.

**Expectations**

It is my desire that each of you will succeed in this course. I will try to help you in anyway I can. It is vitally important you keep up with the material. I have found, without exception, those that received a grade of A or B in this course have been those that have consistently done the homework and took it seriously. Please see me if you are having difficulties. This course will require a minimum of six hours a week of outside studying.

The prerequisites for this course are organic and analytical chemistry. If you had difficulties in those courses, you will find this course particularly difficult and you will need to put forth even more study time. **NOTE: It is a requirement, and it will be assumed, that you are fluent and very comfortable with algebra.** Further, you should have had some calculus – it will make understanding some of the principles easier.

**WAC Course**

Chemistry 4711 has been designated a WAC (Writing Across the Curriculum) course. This means that there is a writing component as part of this course that must be **successfully** completed to receive a **passing** grade. The writing requirement will consist of a case study.

### Examinations

I will give five exams (each 50 minutes in length) throughout the semester. I will **not** give makeup exams. You will have one week from the time the exam is handed back to inquire about the grading. After that week the grade on the exam is **final**. The final exam will be a comprehensive examination (covering material throughout the course).

### Grading

The final grade will be determined from the five exams, the final exam, the case study, and quizzes. Each exam will count 100 points, the final exam 200 points, the case study 50 points, and quizzes 50 points. Grades will be calculated based on a maximum of 800 points.

Grade Scale: > 90% = A; 80 - 90% = B; 70 - 80% = C; 60 - 70% = D; < 60% = F

### Policies

1. You are responsible for all material covered and all announcements made in class. Absence from class does not excuse or relieve you of this responsibility.
2. Cheating will not be tolerated. On the first occurrence it will result in a grade of zero for the exercise in question. A second occurrence will result in a grade of F for the course. All out of class assignments will be done in the absence of any collaboration from others. Any questions, clarifications, or requests for assistance should be directed only to me.
3. No make-up exams or assignments will be given. Anyone not able to take an exam on the day scheduled must contact me before the exam.
4. Your attendance at all class times is critical to your success in this course. I reserve the right to withdraw you from class roles due to flagrant absences or tardiness.
5. NO CELL PHONES!! I do not want to see them. I do not want to hear them. Prior to entering the classroom, you will place your cell phones in your backpacks and leave them there until after class. Violation of this rule will result in immediate dismissal from that day's class, if during an exam – a grade of zero.

### TENTATIVE SCHEDULE

		<u>Chapters</u>
8/15	Introduction: Biomolecules, Weak Acids, Amino Acids	1, 2, 3
8/17	Amino Acids and Peptides	3,4
8/20	Protein Structure	4
8/22	Protein Structure and Purification	4,5
8/24	Myoglobin & Hemoglobin	5
8/27	Protein Structure & Enzymes	6
8/29	Enzyme Reactions and Enzyme Kinetics	6

8/31	<b>Exam I</b>	
9/05	Enzyme Inhibition	6
9/07	Bisubstrate kinetics, allosterism , & regulation	6
9/10	Carbohydrates	7
9/12	Carbohydrates	7
9/14	Nucleic Acids	8
9/17	Lipids	10
9/19	Membranes	11
9/21	Transport	11
9/25	<b>Exam II</b>	
9/26	Biosignaling	12
9/28	Bioenergetics	13
10/01	Glycolysis I	14
10/03	Glycolysis II	14
10/05	Fate of Pyruvate / Entry of other carbohydrates into glycolysis	14
10/08	Regualtion of glycolysis	14, 15
10/10	Pentose Phosphate Pathway	14
10/16	<b>Exam III</b>	
10/18	Pyruvate Dehydrogenase Complex and Cirtic Acid Cycle I	16
10/20	Citric Acid Cycle II	16
10/23	Regulation/ CAC a source of biosynthetic intermediates	16
10/25	Electron Transport	19
10/27	Oxidative Phosphorylation	19
10/30	Lipid Metablism	17
11/01	Fatty Acid Oxidation	17
11/03	Fatty Acid Oxidation	17
11/06	<b>Exam IV</b>	
11/08	Ketone Body formation/ Regulation	17
11/10	Urea cycle	18
11/13	Amino acid oxidation	18
11/15	Amino acid oxidation	18
11/17	Gluconeogenesis & Regulation	15

11/19	Glycogen Biosynthesis & Regulation	15
11/26	Lipid Biosynthesis	21
11/28	Synthesis of Fatty acids and triglycerides	21
11/30	<b>Exam V</b>	
12/03	Conclusion	
12/05	Conclusion	

**SUPPLEMENTARY TEXTS** (recommended, not required)

Schaum's Outline Series Theory and Problems of Biochemistry, McGraw Hill Book Co. 1988.

BIOCHEMISTRY by Stryer

BIOCHEMISTRY by Voet and Voet

BIOCHEMICAL CALCULATIONS by Segel

PRINCIPLES OF BIOCHEMISTRY by White, Handler and Smith

PROTEINS by Creighton

ENZYME STRUCTURE AND MECHANISM by Fersht