

**CHEMISTRY 339**  
**Metabolism**  
Spring 2008  
CFS 103, TuTh 11:00 – 12:20

**Dr. Ilona Petrikovics**      **ixp004@shsu.edu**

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**Office hours:**

Wednesday /Friday: 9:00-12:00

Others by appointment

**Text:** *Biochemistry, 6<sup>th</sup> Ed.*, Berg, Tymoczko and Stryer  
Scientific calculator also required.

CHM 339 (3 hr credit) is the second semester of Biochemistry, focusing primarily on metabolic pathways. Prerequisites for this course are CHM 239 and CHM 348 (grade of C in each).

A resting human consumes approximately 40 kg of ATP in a 24-hour period. The formation of ATP, NADH and molecular building blocks for other biomolecules in cells (metabolism) is the result of the extraction of energy from the environment and the conversion of foodstuffs into cellular components by a highly integrated network of chemical reactions. ATP and NADH are directly involved in the transfer of energy from foodstuffs to forms useful in movement, transport and biosyntheses. These two molecules must be continuously generated since they are being continuously consumed. The extraction of energy from foodstuffs can be divided into three stages: 1) the breakdown of large molecules into smaller ones; 2) the breakdown of small molecules into a few simple units, primarily the acetyl unit; and 3) the citric acid cycle and oxidative phosphorylation. The three major classes of foodstuffs, carbohydrates, fats and proteins, have unique and shared pathways of degradation. Following molecules through these pathways shows the chemical reactions involved, controls, and how the pathways are interrelated.

**Objectives:** Students who successfully complete this course will:

- 1) Gain factual knowledge about several metabolic pathways and the chemical changes which occur as cells extract energy from the environment
- 2) Understand these metabolic processes are integrated and regulated
- 3) Understand the major stages of pharmacokinetics and metabolism (biotransformations) of exogenous molecules (xenobiotics) in the body
- 4) Get insight to the industrial drug development processes
- 5) Be able to apply the course information to problem solving

The tentative schedule for material to be covered and exam dates is below:

| DATE              | SUBJECT  | TEXT CHAPTERS  |
|-------------------|--|--|
| 1/17/08 - 2/05/08 | Introduction*; Basic Concepts and Design for Metabolism;<br>*Bioenergetics*; Carbohydrate Structure and Functions<br><a href="#">Exam 1</a>                                | 15, 11, 12<br>*Additional handouts will be provided for the “Introduction” and “Bioenergetics” sections  |
| 2/07/08 – 2/26/08 | Glycolysis and Glucogenesis;<br>Citric acid Cycle<br><a href="#">Exam 2</a>  | 16, 17   |
| 2/28/08 - 4/03/08 | Oxidative Phosphorylation;<br>Lipid Structure and Functions; Fatty Acids and their Metabolism;<br>The Integration of Metabolism<br><a href="#">Exam 3</a>                  | 12, 18, 27   |
| 4/08/08 - 4/24/08 | Drug Development; Industrial Biochemistry*; Basics of Pharmacokinetics and Bio-transformations of Exogenous Molecules (Xenobiotics) in the Body*<br><a href="#">Exam 4</a> | 35,<br>*Additional handouts will be provided for the “Industrial Biochemistry” and “ Basics of Pharmacokinetics and Bio-transformations of Exogenous Molecules (Xenobiotics) in the Body” sections |
| 4/29/08 - 5/01/08 | Review for the Final   |  |

**Final Exam:** Cumulative

You are expected to attend all scheduled classes. In accordance with University policy, regular attendance is required; however, no points will be awarded or subtracted based on your attendance. There are no make-up exams or quizzes. A grade of zero will be recorded for any work missed. Students may not record lectures without my permission. There are [four exams](#) and a cumulative [final exam](#) scheduled for the semester. 90% of the course grade will be the average of (the 3 highest exam scores plus the final). Final exam counts 1.5 test grades. Any quizzes or other assignments will represent 10% of the grade for the course.

|  |                |                     |
|--|----------------|---------------------|
| Average of 3 highest exam grades: (3 x 100 points) | 300 points     | 60% of course grade |
| Final exam:  | 150 points     | 30% of course grade |
| Quizzes & other assignments:                       | max. 50 points | 10% of course grade |

|                       |   |
|-----------------------|---|
| Grade scale: 90 - 100 | A |
| 80 - 89               | B |
| 70 - 79               | C |
| 60 - 69               | D |
| Below 60              | F |

Some assignments/quizzes will be given via email and/or on Blackboard. It is your responsibility to check you university email account daily and the Blackboard site for this course on a regular basis.

**Student Syllabus Guidelines:** You may find online a more detailed description of the following policies. These guidelines will also provide you with a link to the specific university policy or procedure:

<http://www.shsu.edu/syllabus/>

**Academic Dishonesty:** Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. *See Student Syllabus Guidelines.*

**Classroom Rules of Conduct:** Students are expected to assist in maintaining a classroom environment that is conducive to learning. Students are to treat faculty and students with respect. Students are to turn off all cell phones while in the classroom. Under no circumstances are cell phones or any electronic devices to be used or seen during times of examination.

**Student Absences on Religious Holy Days:** Students are allowed to miss class and other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Students remain responsible for all work. *See Student Syllabus Guidelines.*

**Students with Disabilities Policy:** It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should visit with the Office of Services for Students with Disabilities located in the Counseling Center. *See Student Syllabus Guidelines.*

**Visitors in the Classroom:** Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

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