

Nutritional Biochemistry (CHE 217)

Spring 2009

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Chemistry & Physical Sciences

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This is a 3 credit course. It meets MW 4:30-5:45 PM in Oberkotter 1. Prerequisites are CHE 111/112 and CHE 203.

Required textbook: H. Stephen Stoker, Organic and Biological Chemistry, 4th edition, Houghton-Mifflin, 2007.

Course Description

Chemistry 217, Nutritional Biochemistry, will consider basic concepts of biochemistry as applied to metabolism including the structure and function of carbohydrates, lipids, amino acids and proteins. Emphasis is placed on metabolic pathways and the interrelationships of major nutrients and metabolic processes and their role in the overall nutritional health of an individual.

Course Objectives: Students will be introduced to the chemistry occurring in biological systems. Students will see the integration and regulation associated with this chemistry. This basic knowledge of biochemistry will prove useful in future scientific endeavors and will be necessary for a thorough understanding of the role of nutrition in health maintenance. Through problem sets and exams, students will practice applying their biochemical knowledge to novel problems/situations. This will contribute to the development of scientific and quantitative reasoning skills.

Course Outcomes

After completion of this course, you should be able to explain the following:

- structure and function of carbohydrates, lipids, proteins and nucleic acids
- chemical function of vitamins
- nomenclature, function, and regulation of enzymes
- chemistry and role of ATP in metabolism
- biochemical energy production
- principles and regulation of carbohydrate metabolism: glycolysis, glycogen synthesis and degradation, gluconeogenesis, pentose phosphate pathway
- lipid metabolism: fatty acid oxidation, fatty acid synthesis, cholesterol synthesis
- protein metabolism

Grading Policy:

The grade for this course will be determined as follows:

- a) Three one hour in class examinations will be given and each will be worth 100 points. Exams 2 and 3 are not designed to be comprehensive. However, there may be information learned previously that is necessary for satisfactory completion of the exams.
- b) Five quizzes will be given throughout the semester. Each will be worth 20 points. The quizzes may or may not be announced. They are designed to encourage the student to keep abreast of the material.
- c) A final comprehensive exam will be given worth 200 points.

At the end of the semester, there is a possible total of 600 points. To compute the lecture grade, add points from all exams/quizzes, divide by 700 and multiply by 100. The grade will be some percentage between 0 and 100%. Letter grades will be assigned based on the following scale:

93-100%	A	80-82.9%	B-	67-69.9%	D+
90-92.9%	A-	77-79.9%	C+	60-66.9%	D
87-89.9%	B+	73-76.9%	C	Below 60%	F
83-86.9%	B	70-72.9%	C-		

Office hours: Regularly scheduled office hours will be posted on my office door. These are times when I will definitely be in my office, but I am happy to help at other times if my schedule permits. Anytime I am in my office, please feel free to stop by. If you want to be sure of my availability outside regular office hours, you can schedule an appointment.

Lecture Policy: Students are expected to attend all lectures. Lectures are a necessary supplement to the textbook. In the event of a missed lecture, the student is responsible for the lecture material, any assignments which were given, announcements or any other information that was provided in class.

Attendance at Exams: Students are required to attend class on exam days. Make-up exams will not be given without a valid excuse. Validity of the excuse will be up to the discretion of the instructor. Be forewarned; you will need to have a very good reason for missing an exam! I am not trying to be harsh. I am only trying to treat all students in a fair and equitable manner. If the student is aware of some responsibility which will interfere with an exam date, it must be discussed with the instructor in advance. If an exam is missed without advance notice due to illness or emergency, a valid written excuse will be required from the doctor/school nurse in the case of illness or from the Dean of Students' Office in the case of a family emergency. If a student does not have a valid excuse for missing an exam, the student will receive a zero for the missed exam. Your obligations for this course include attendance at the final exam, on the day and time scheduled by the Registrar's Office. You should not make travel arrangements until the final exam schedule is published; if you must make plans early, you should schedule your travel after the last final exam day.

Assignments: Students are expected to do assigned problems at the end of each chapter. It is essential for learning the material and performing well in the course. Additional problem sets may be handed out by the instructor periodically. Though these problem sets/homework will not be graded, the students understanding of the material and ability to do well in the course is dependent on completion of these assignments. I am relying on the student to be responsible enough to do homework without being forced to do so. It is imperative for a clear understanding of the material and for learning to apply what was learned.

Honor Philosophy: The Cedar Crest College Honor Philosophy states that students should uphold community standards for academic and social behavior in order to preserve a learning environment dedicated to personal and academic excellence. Upholding community standards is a matter of personal integrity and honor. Individuals who accept the honor of membership in the Cedar Crest College community of scholars pledge to accept responsibility for their actions in all academic and social situations and for the effect their actions may have on other members of the College community. Incumbent from the Honor Code, academic integrity and ethical behavior provide the foundations of the Cedar Crest scholarly community and the basis for our learning environment. Cedar Crest College expects students to set a high standard for themselves to be personally and

intellectually honest and to ensure that other students do the same. This standard applies to all academic work (oral, written, or visual) completed as part of a Cedar Crest education.

Students should consult the appropriate sections of the Student Handbook defining and listing examples of academic misconduct and the potential consequences associated with such action.

Classroom Protocol: Appropriate classroom behavior is defined and guided by complete protection for the rights of all students and faculty to a courteous, respectful classroom environment. That environment is free from distractions such as late arrivals, early departures, inappropriate conversations and any other behaviors that might disrupt instruction and/or compromise students' access to the Cedar Crest College education. Inappropriate classroom protocol may lead to removal from the classroom and a lowering of the lecture grade. If continuous, it can lead to forced withdrawal from the class.

Students should consult the Student Handbook for more examples of disruptive classroom behavior. Because some may consider certain behaviors disruptive and some not, the instructor will have the final word on what constitutes disruptive behavior in the classroom.

Disabilities: Students with documented disabilities who may need academic accommodations should discuss these needs with their professor during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

Note to students: Nutritional Biochemistry is a very intensive course and as such requires a serious commitment on the part of the student. There is a wealth of information in the field of biochemistry and the study of biochemistry encompasses many areas of chemistry and biology. This makes the course challenging but also very satisfying. It is a course that contains many different types of material and requires many different skills. Principles learned in general and organic chemistry will be applied in this course. If these principles are lacking, please take it upon yourself to review and brush up on the necessary material as we proceed through the course. Because of the wealth of info, some memorization will be needed to acquire a solid background in biochemistry, but we will also need to learn to apply that assimilated knowledge. The chapter problems and problem handouts are designed to aid in that aspect. Try to complete these problems on your own before resorting to the posted solutions or solutions manual. It is a challenging subject, but definitely worth the challenge. The more effort put into learning the material, the more rewarding the effort will be.

Exams are intended to assess mastery of the subject not just familiarity with it. Answers to exam questions need to be reasonable and use terminology appropriately. Always work through assigned problems. Do not do them in your head and expect to complete them on paper when taking the exam. Remember I need to grade what is on the paper; I cannot gauge what is in your head. If you are not comfortable with the material, you are not ready for the exam. Please be honest with yourself – seek help if you are not comfortable with the material. I will do all I can to help you, but I can't do it for you. It requires a serious effort on your part. I do not gain any satisfaction from giving a student a low grade. I do, however, need to assess what you have learned and assign an appropriate grade based on that.

TENTATIVE SYLLABUS

DATE	TOPIC	CHAPTER
Jan 19	Introduction to the course	Syllabus
Jan 19-26	Carbohydrates	Chapter 7
Jan 28, Feb 2,4	Lipids	Chapter 8
Feb 4-11	Proteins	Chapter 9
Feb. 16	EXAM #1- Chapters 7,8,9	
Feb. 18-25	Enzymes and Vitamins	Chapter 10
Feb. 25, Mar 2-4	Nucleic Acids	Chapter 11
Mar 16-23	Biochemical Energy Production	Chapter 12
Mar 25	EXAM #2- Chapters 10-12	
Mar 30, Apr 1-6	Carbohydrate Metabolism	Chapter 13
Apr 6-15	Lipid Metabolism	Chapters 14
Apr 20-27	Protein metabolism	Chapters 15
April 29	EXAM #3- Chapters 13-15	
May 4	Wrap-up	

**FINAL EXAM AS SCHEDULED BY
REGISTRAR (May 6-15)**