

# CHEM 37700/CHEM 64100

## General Biochemistry II

### Spring

#### Course Coordinators:

Prof

Office:

Email:

Prof.

Office:

Email:

Dr.

Email:

#### Course Location:

#### Course Meeting Times:

**Office hours:** By appointment only

**Required texts:** R.H. Garrett and C.M. Grisham (ISBN 0-534-49033-6), *BIOCHEMISTRY*, 5th edition, 2013. Brooks/Cole.

Jemiolo & Theg's 3rd edition Student Solutions Manual to accompany *Biochemistry* by Garrett and Grisham (ISBN 0-534-49035-2), Published by Brooks/Cole.

**Course Objectives:** This is the second course of a two-semester program recommended for chemistry, biochemistry, biology, and pre-medical students, or for graduate students who require a broad introduction to biochemistry. The major objective is to develop the tools to analyze biological function in chemical terms—the physical, chemical, and biological principles by which biomolecules, reactions, or pathways operate, and to provide a comprehensive overview of the biochemical principles that govern the biological processes of life on our planet. Topics to be covered include photosynthetic energy transduction and dark reactions, biosynthetic and catabolic pathways, biochemical aspects and control of gene expression and protein synthesis.

In addition to the major goals listed in the course description above, course goals include:

- 1) the development of problem solving and critical analysis skills,
- 2) the strengthening of communication skills in written format
- 3) the discovery and exploration of a variety of resources for problem solving,
- 4) the identification of the relevance of biochemical phenomena to everyday life and
- 5) the understanding of the conceptual organization of the major metabolic pathways and their connections to one another. Please note that memorizing biochemical pathways and structures is not an objective of this course. The level of attainment of these goals will be evaluated by class discussions, problem sets resolution, and written tests.

**Learning Outcomes:** Upon completion of this course, students should be able to apply the principles, skills, and structural information concerning basic components of biological systems (proteins, nucleic acids, carbohydrates) learned in CHEM 376 to understand the function of more complex and integrated systems.

By the completion of this course the student should be able to:

1. Identify the molecules involved in biochemical metabolic pathways.
2. Recognize rate-regulatory steps in biochemical metabolic pathways.
3. Demonstrate biochemical metabolic pathways and their regulation.

4. Elucidate fundamental biochemical functions and concepts including mechanisms of actions.
5. Integrate and evaluate biochemical and physiological concepts and mechanisms related to normal healthy states to diseases or pathologic states

A great deal of information will be covered over the course of the semester; we strongly suggest you do the assigned reading in advance of lectures, review lecture notes afterward, and keep up with practice problems. *Do Not Fall Behind!*

**Prerequisites:** Students should have had 1-2 semesters each of general chemistry, organic chemistry, and CHEM 37600. Students are expected to be familiar with the structures and chemical reactivities of organic functional groups and to be capable of performing mathematical calculations that involve simple algebra. **It is the responsibility of the student to be familiar with the background material, and to review as necessary.** Most importantly, since this course builds upon the skills and principles from CHEM 37600, students are expected to remain current with this material.

**Student Responsibilities:** Students are expected to come to class prepared to learn. Students should actively participate in class discussions and arrange meetings with the instructor and if problems arise. If there is something that you do not understand, please do not wait until examination time to express your confusion or to bring up topics that are unclear. Office hours are set up for the express purpose of assisting students. We are here to facilitate your learning throughout the entire course. Please have cell phones turned OFF before class begins.

**Class Attendance:** Your presence in class is important, as material will sometimes be covered that is not included in the book and different topics may be emphasized. In addition, we cover review questions and exam preparation strategies that are not necessarily part of the notes. You will be held responsible for all material covered in class sessions, whether you are present or not.

**Grading:** The final course grade will be assigned based upon the average of three non-cumulative exams. The exams will be graded in the percentage scale and reported in the letter grade following Hunter College grading system. Each exam will represent 33% of the total grade. Makeup of an exam will be allowed in EXTREME cases only, and only when the absence is deemed excusable. Students are required to inform one of the instructors of such absences in advance to gain approval for makeup of missed course material.

**Resources:** PowerPoint presentations for each topic will be placed on Blackboard a few hours in advance of each class. It is your responsibility to download these notes prior to class. If you have any difficulty accessing these files or need them in a different format, please inform Prof. Kleiman or Prof. Holford, and they can arrange to get you a copy of what you need. In addition to the textbook required for this course, there is an assigned companion guide, which contains review summaries and highly recommended practice problems—some of which will be “assigned” (for your own practice, not to be handed in) as further coverage of a topic from a different perspective or in more detail and to help you prepare for exams. Please make use of these resources as individual topics are covered, rather than waiting for test day to arrive.

**Study Methods and Review Sessions:** You are encouraged to read the relevant chapter *before* each class so that you are ready to learn. Write down your questions as you read, so that if they are not answered in class, you may ask them. Download PowerPoint notes and look over them. Take useful notes in class that will clarify figures in the PowerPoint slides. After class, go over your notes and reread the chapter, preparing yourself for the next lecture. Students are encouraged to organize into small study groups to review course material and to work on recommended study questions.

**Honor Code:** Each student has the responsibility (1) to uphold the highest standards of academic integrity in his or her own work, (2) to refuse to tolerate violations of academic integrity in the University community, and (3) to foster a high sense of integrity and social responsibility on the part of the University community. *This means that you will not give or receive information during an examination, nor will you consult unauthorized sources of information during an examination.* Violations of the Honor Code will not be tolerated and will result in zero points being awarded for the course work in question.

**Students with Disabilities:** Students with disabilities needing academic accommodations should (1) register with and provide documentation to the Office of Student Services (OSS) and (2) bring a letter to the instructor from the OSS indicating that you need academic accommodations. *Please do this within the first two weeks of the class.*

**Graduate level CHEM 64100:** In addition to the undergraduate level tests, graduate students taking this course will be tested on their knowledge of three assigned research publications. The students will be tested on their theoretical as well as their research design knowledge of the material. For graduate students taking 6400 each undergraduate level test will represent 25% of the total grade and the written final research paper other 25%. The exams will be graded in the percentage scale and reported in the letter grade following Hunter College grading system.

### **Hunter College required statements for syllabi**

1. Academic Integrity Statement: “Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.”
2. ADA Statement: “In compliance with the ADA and with Section 504 of the Rehabilitation Act, Hunter College is committed to ensuring educational access and accommodations for all its registered students. Hunter College’s students with disabilities and medical conditions are encouraged to register with the Office of AccessABILITY for assistance and accommodation. For information and appointment contact the Office of AccessABILITY located in Room E1214 or call (212) 772-4857 /or VRS (646) 755-3129.”
3. Hunter College Policy on Sexual Misconduct “In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.
  - a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).
  - b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

CUNY Policy on Sexual Misconduct Link:

<http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links.pdf>

## TENTATIVE SCHEDULE CHEM 377/CHEM 641 Spring 2018

CLASS	DATE	MATERIAL	Lecturer	Chapters
1	1/29	Glycolysis	JM	18
2	1/31	Tricarboxylic Acid Cycle	JM	19
3	2/5	Electron Transp. and Oxidative Phosphorylation	JM	20
4	2/7	Electron Transp. and Oxidative Phosphorylation	JM	20
5	2/14	Gluconeogenesis/Glycogen Metabolism	JM	22
6	2/21	Glycogen Metabolism/Pentose Phosphate Pathway	JM	22
7	2/26	Photosynthesis	JM	21
8	2/28	Photosynthesis	JM	21
	<b>3/5</b>	<b>EXAM 1</b>	<b>JM</b>	<b>19–22</b>
9	3/7	Fatty Acid Catabolism	JM	23
10	3/12	Fatty Acid Catabolism	JM	23
11	3/14	Lipid Biosynthesis	JM	24
12	3/19	Nitrogen Acquisition/Amino Acid Metabolism	JM	25
13	3/21	Nitrogen Acquisition/Amino Acid Metabolism	JM	25
14	3/26	Cancer Metabolism*	JM	<i>*not in book</i>
15	3/28	Synthesis and Degradation of Nucleotides	MH	26
	<b>3/30-4/8</b>	<b>SPRING BREAK</b>		
16	4/9	Synthesis and Degradation of Nucleotides	MH	26
17	4/16	Metabolic Integration and Organ Specialization	MH	27
	<b>4/18</b>	<b>EXAM II</b>	<b>JM/MH</b>	<b>23–27</b>
18	4/23	DNA Metabolism/Replication/Recomb/Repair	MH	28
19	4/25	DNA Metabolism/Replication/Recomb/Repair	MH	28
20	4/30	DNA Metabolism/Replication/Recomb/Repair	MH	28
21	5/2	Transcriptional Regulation and Gene Expression	MH	29
22	5/7	Transcriptional Regulation and Gene Expression	MH	29
23	5/9	Protein Synthesis	MH	30
24	5/14	Protein Folding/Processing/Degradation	MH	31
25	5/16	Exam III	MH	31
	<b>5/23</b>	<b>EXAM III</b>	<b>MH</b>	<b>28–31</b>