

## BIOCHEMISTRY II (CHEM 4610/6610) Fall 2018

**Instructor:** Dr. Victoria Mariani, 216 Courtland North, Tel. (404) 413-5542, [vmariani@gsu.edu](mailto:vmariani@gsu.edu)

**Prerequisites:** required 4610: Chem 4600 (grade of C or higher); required 6610: Chem 6600 (grade of B or higher)

**Lecture:** MW 3:30 pm – 4:45 pm, PSC 236

**Office Hours:** Wednesdays 1 - 3. Fridays 3 – 5.

**Textbook:** You can use 7th or 8th edition of text. I use the 8<sup>th</sup> edition for my reading assignments.

Biochemistry, 8th Ed., Berg, J.M.; Tymoczko, J.L.; Gatto, G.J.; Stryer, L., (2015), W.H. Freeman: New York, NY. [ISBN 1-4641-2610-0 Hardcover or ISBN 1-4641-8801-7 Looseleaf] or

Biochemistry, 7th Ed., Berg, J.M.; Tymoczko, J.L.; Stryer, L., (2012), W.H. Freeman: New York, NY. [ISBN 1-4292-2936-5 Hardcover or ISBN 1-4292-7396-8 Looseleaf]

Workbook: This is strongly recommended. The workbook includes learning objectives, self-assessment problems with solutions, and comprehensive problems. I will go over the questions from the text and workbook (see icollege “suggested problems”) during class. I recommend you use the 8<sup>th</sup> edition of the workbook.

Biochemistry Student Companion, 7th Ed., Deis, F.H.; Gerber, N.C.; Gumpert, R.I.; Koeppe, R.E., (2012), W.H. Freeman: New York, NY. [ISBN 1-4292-3115-7 Paperback].

Biochemistry Student Companion, 8th Ed., Rhodes, C.; Fertuck, K.; Josephy, D.; Koeppe, R.E., (2015), W.H. Freeman: New York, NY. [Paperback]

**Tutorial Center:** The tutorial center is in Sports Arena 125 Decatur St SE, First Floor

There will be a tutor specifically for Biochemistry (make sure it is the tutor I recommend) there to answer your questions. This is a good time to ask questions on specific homework problems and lecture topics.  
Time: TBA

**iCollege:** BIOCHEMISTRY II XLS GROUP J7 FALL SEMESTER 2018

All announcements will be posted on icollege. Please check it often. All notes from class will be posted within 24 hours after class.

**Do not email me on icollege.** Email me at [vmariani@gsu.edu](mailto:vmariani@gsu.edu)

**Exams CHEM 4610:** There will be four class exams worth **100** points each. The lowest exam grade will be dropped. If you miss more than one exam, the 2<sup>nd</sup> missed exam will require proper documentation. See: <http://codeofconduct.gsu.edu/files/2013/03/2013-14-Student-Code-IV.F.-Policy-on-Class-Attendance.pdf>

There will be a required comprehensive final exam worth **150** points (on **Dec 10 1:30 pm**). The final exam is mandatory, and it will not be dropped under any circumstance. Failure to take the final WILL NOT result in a grade as an incomplete, simply a 0 will be used as the final exam grade.

Test scores will be posted on icollege. If there is a mistake or your score is missing, you must come to my office to discuss. *You are responsible for checking grades!* The icollege website is simply a tool to report grades, it is not my gradebook.

**Quizzes CHEM 4610:** Quizzes will collectively be worth **50** points. There will be approximately 10-15 quizzes on icollege and about 10 quizzes in class. Quizzes will be 3 - 5 questions. To earn the maximum quiz grade you need about 80% of the points in each category (in class and icollege). The final quiz score will be approximately 70:30 in class: icollege.

**Grade Calculation 4610:**

1. Add up 3 highest exam grades, total points earned on quizzes, final exam grade.
2. Divide by 5 for %
3. Use scale to estimate grade

Semester Grade = (sum 3 best class exams + quiz points + final exam) / 5

A+ 97% A 93% A- 89% B+ 85% B 80% B- 76% C+ 68% C 62% C- 58% D 50% F <50%

**Graduate CHEM 6610:** There will be four class exams worth **120** points each. The lowest exam grade will be dropped. (See above.) There will be a required comprehensive final exam worth **200** points (on **Dec 10 1:30 pm**). (See above.)

**Quizzes CHEM 6610:** Quizzes will collectively be worth **40** points. There will be approximately 10-15 quizzes on icollege and about 10 quizzes in class. Quizzes will be 3 - 5 questions. To earn the maximum quiz grade you need about 80% of the points in each category (in class and icollege). The final quiz score will be approximately 70:30 in class: icollege.

**Grade Calculation 6610:**

1. Add up 3 highest exam grades, total points earned on quizzes, final exam grade.
2. Divide by 6 for %
3. Use scale to estimate grade

Semester Grade = (sum 3 best class exams + quiz points + final exam) / 6

A+ 97% A 93% A- 89% B+ 85% B 80% B- 76% C+ 68% C 62% C- 58% D 50% F <50%

**Learning Outcomes:** The course will focus on developing an understanding of the biochemical principles and processes that govern the structure, interactions, functions & transformations of biomolecules; this will help students rationalize biochemical facts and solve problems. Upon successful completion of the course students will have the tools to be able to apply their knowledge of biochemistry to understand the causes of human diseases, as well as applications of biochemistry in medicine, agriculture and the environment.

**Course Objectives:** A comprehensive and integrated review of modern biochemistry with emphasis on proteins, enzymes, nucleic acids, lipids, carbohydrates and metabolism. Will examine biomolecular structure-function relationships, concepts of enzyme function, regulation, bioenergetics, metabolism, gene expression, and characterization of biomolecules. Organization, transport and signaling in cells will also be examined. Principles of acid/base chemistry, redox, organic mechanisms, kinetics, and thermodynamics will be applied throughout. *Working knowledge of these topics covered in 1211, 1212, 2100 2410 and 4600 (or 6600) is expected PRIOR to taking biochemistry.*

**Secrets to Success:** Those who are successful in this course: 1) **Review:** Read the text and/or look over power points before lecture. This is to familiarize yourself with the material before it is covered such that one can pick up information in class time. 2) **Reinforce:** Look over and/or recopy the notes from the lecture within a day of the class. This is to reinforce the material and to make you aware of any problem spots. 3) **Apply:** Regularly work problems from the text, companion, sample exams and internet. If you cannot apply the material it will be difficult to answer multiple choice questions on the exams. 4) If you have questions about the material or problems come to my office hours with questions

To pass this course you need to do more than simply memorize the material. You need to be able to “apply” the material. Reading the text or another source is real important for this. To be successful one must learn to “speak the language of biochemistry”.

**Notes:** There will be no incompletes given for this course. Poor course performance is not rewarded with an incomplete. Do not ask. If you have a hardship, the Dean of Students is where you go. Please see: <http://deanofstudents.gsu.edu/student-assistance/emergency-withdrawal/>

*There will be no grade changes in this course.* I simply add up the points you earned. I cannot alter what you earned. Unfortunately, there is no score for “hard work”. If there are any issues with your grade or course work, you must come to my office (not email) before the last day of class to discuss. The day grades are due is a terrible time to address these issues!

### **Exam Dates (Subject to change)**

<u>no.</u>	<u>Date</u>	
1	Wednesday	September 12
2	Monday	October 8
3	Monday	October 29
4	Wednesday	November 28
F	Monday	December 10 at 4:15!

Anything is in **blue** was covered ( or discussed) in Biochemistry 1 (4600). We will go over these topics quickly.

### **Topics for Exam 1:**

1.3 properties of water, intermolecular interactions, acid/base chemistry, buffers, pK<sub>a</sub>

8-ap enzymes, classes of enzymatic reactions

16.1 -16.4 glycolysis reaction, mechanisms, and regulation, fermentation reaction, gluconeogenesis

17.1 – 17.4 transition reaction and regulation, citric acid cycle reactions, mechanisms, and regulation

18.1 – 18.6 biochemical oxidation-reduction reactions (redox review), electron transport chain, oxidative phosphorylation, regulation, membrane transport and shuttles

21.1 – 21.5 glycogen breakdown & regulation, glycogen synthesis and regulation

14.1, 14.2 signal transduction: gPCR's and tyrosine phosphorylation cascades

27.3 diabetes

### **Topics for Exam 2:**

22.1 – 22.5 fatty acid catabolism, ketone bodies, fatty acid synthesis

27.5 overview of metabolic processes

19.1 – 19.4 photosynthesis, light and dark reactions

20.1 – 20.5 Calvin cycle and pentose phosphate pathway

### **Topics for Exam 3:**

23.1- 23.5 protein turnover, amino acid catabolism, urea cycle, incorporation of intermediates

24.2 – 24.4 amino acid biosynthesis, regulation, distribution

25.1 -25.5 nucleotide biosynthesis regulation, distribution

26.1 – 26.4 cholesterol biosynthesis and transport

### **Topics for Exam 4:**

3.1 - 3.2 protein purification, separation techniques

4.1 - 4.3 DNA structure and function

5.2 recombinant protein purification

30.1 – 30.4 Protein synthesis

31.1 – 31.4 Regulation of gene expression, transcription factors

### **Note:**

We may progress faster or slower throughout the semester. Topics from a previous section could be held for the next exam or topics from a later session could have been covered and added to the exam.

I only will add topics to the exam that have been covered!

**\*\*Please come to class regularly for exact topics covered on the exam.\*\***