Chemistry 160a
Structure and Function of Biological Molecules
Fall 2017

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Office Hours: M: 12-12:30 PM, W: 10-10:45 AM **Class Meets: SQU-338 MWF 9-9:50 AM**
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Required Textbook: *Biochemistry Concepts and Connections,* 1st Edition, by Appling, Anthony-Cahill and Mathews. ISBN: 978-0-321-83992-3

Required Online Homework: Mastering Chemistry (See homework section for more information).

Course Description: Describes the chemistry and biochemistry of amino acids, proteins, nucleic acids, lipids and carbohydrates. Also includes enzyme kinetics, the structure and function of biological membranes and discussion of some common laboratory methods.

Course Prerequisite: Successful completion (C- grade or better) of Chemistry 124 (or equivalent) ***and all previous chemistry pre-requisites***. Math 26A or Math 30 (or equivalent) is recommended.

How I view you as students: My expectations of you are high because:

- You are intelligent individuals.
- As you are in college, I expect that you are interested in learning and in continuing to improve on your learning process.
- You have chosen chemistry as your major, which is one of the most challenging areas of science.
- Biochemistry is a complex field.
- This course was designed for biochemistry majors, and should be expected to be rigorous.
- When you graduate, your employer will expect you to know a lot about chemistry/biochemistry, be a good problem solver, and know how to find information on your own when you don't know something.

Grading:

Three exams @ 100pts.	300
Best 4 out of 5 quizzes @ 25 pts.	100
Final exam (Cumulative)	200
Mastering homework (% correct)	50
	650 pts. Total

Letter grades will be assigned based on a range of:

A:	90% and up
A-:	88-89.9%
B+:	86-87.9%
B:	80-85.9%
B-:	78-79.9%
C+:	76-77.9%
C:	68-75.9%
C-:	66-67.9%
D:	55-65.9%
F:	Below 55%

Attendance: Attendance of the lecture is not required, but is *highly* recommended.
Please see the current University catalog for the class drop policy

Course Etiquette: Students are expected to be on time to class. It is very disruptive to both the instructor and the other students in the course to come in late. Cell phones must be turned **completely off** during class time. Failure to do so may result in confiscation of the cell phone until the end of class. Repeat offenders may be subject to loss of points in the course, which may impact the student's final grade in the course.

Exam Day Rules: On exam days, please place your backpack, including cell phone (turned off), in the front of class by the instructor. No hats are to be worn on exam day. The only items allowed at your desk are: pencil/pen, eraser, Scantron form, basic calculator (no cell phones, no graphing calculators). You will not be permitted to leave the room during an exam for any reason, including needing to go to the restroom/get a drink of water. If you do leave the classroom during an exam, your exam is over and must be turned in.

Homework: Homework will be assigned from each chapter through Mastering Chemistry and will be announced in class. It is worth 50 points total for the semester, and your score will be scaled based on your % correct. It is **highly** recommended that the homework be completed for each chapter, as many of the quiz/exam questions will be based on skills learned by doing the assigned problems.

Instructions for Mastering Chemistry

1. Go to **www.pearson.com/mastering/chemistry**.
2. Under Register Now, select **Student**.
3. Confirm you have the information needed, then select **OK! Register now.**
4. Enter your instructor's Course ID MCREYNOLDS41492 and choose **Continue**.
5. Enter your existing Pearson account **username** and **password** and select **Sign in**.
   You have an account if you have ever used a Pearson MyLab & Mastering product, such as MyLab Math, MyLab IT, or Mastering Chemistry.
   - If you don't have an account, select **Create** and complete the required fields.
6. Select an access option.
   - Enter the access code that came with your textbook or was purchased separately from the bookstore.
   - Buy access using a credit card or PayPal account.
7. From the "You're Done!" page, select **Go to My Courses**.
8. Select **Yes** and enter your Course ID to join your course. Click **Continue**.
9. If asked, enter your Student ID according to the instructions provided and click **Continue**.
   That's it! You should see the Course Home page for the course.

Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments.

Quizzes: Five quizzes will be given over the course of the semester. It is possible that a take-home quiz will be given instead of an in-class quiz. Take home quizzes will be due in the following class period and online quizzes will be open for a 24 hour period (announced in class). **You are <u>not</u> to work with your classmates, or anyone else on take-home/online quizzes.** In class quizzes will occur at the beginning of class. There are no make-up quizzes/early quizzes given. Since one score is dropped, if you miss a quiz, it will be omitted from your grade. Subsequent missed quizzes will count as a zero. These quizzes will test you on the current topics covered in class for the week prior and will help to keep you up to date with the material and prepare for the exams by giving you practice at working problems under a time limit (15 minutes). The lowest score for the semester will be dropped from your final grade, and as such, there will be no make-up quizzes. The format of the quizzes can be anything (essay, short answer, mathematical problems, etc.).

Exams: Exams will be based on the lecture, assigned reading, handouts, and homework. The format is the same as for quizzes, but the questions will be more challenging, as you will have had more time to study the material than you have for a weekly quiz. Some questions will also require that you can put multiple lecture concepts together to answer them correctly. **Attendance is required!!** If you must miss an exam for a good reason (ie. Illness) a doctor's note or other evidence of a valid excuse will be required **within one week of the missed exam.** There will be no make up exams. A student with an excused absence will make up the points on that material from the final exam. If an unexcused absence occurs, the exam score will be counted as a zero. The final exam will be comprehensive. It will be given in our regular classroom from 8-10AM on Wednesday, December 13th 2017. Attendance is mandatory and the same rules as above apply.

How to Prepare for Quizzes and Exams:

- Attend class every day.
- Come to class prepared. This means reading ahead in the textbook**.** Take notes as you read, this will help you to formulate questions later, and also helps you to better retain the information.
- After class, recopy your notes (within *hours*, not *days*). Add in additional information gleaned from your reading to make the notes more comprehensive.
- Do the assigned homework.
- Read the chapter summaries. Do you understand everything?
- Check out all of the available resources on Mastering Chemistry. There are a lot of great materials there to enhance your learning and understanding of the material.
- Get into groups to study. You will get different benefits from this than from exclusively studying alone. You will also find that you will have different strengths and weaknesses than other students, so it is mutually beneficial to all.
- Come to office hours and get help when you need it. I won't know what you are having difficulties with unless you say something (or until exam time rolls around…).

Grading Policy: Extreme care will be taken with the grading of your quiz/exam materials in this course. One page is graded at a time for all students, ensuring the utmost in consistency for partial credit assignment. If you detect a mistake in the grading, such as an addition error, please bring it to my attention immediately, and it will be resolved. If, however, you feel that you deserve a greater amount of partial credit than what you were given, I reserve the right to re-grade the entire exam, which may result in a lower overall score.

Cheating: Cheating in any form will not be tolerated. Cheating involves having extraneous notes, in written form or stored in a programmable calculator/cell phone, looking at someone else's exam paper, or alteration of a graded question(s) with submittal for a re-grade, etc.. If a student is caught cheating, I will deal with them in the harshest manner possible, given the nature of the offense. At the bare minimum, the score for the assignment the student was caught cheating on will become a zero and will count towards their final grade. At the maximum, the student will be reported to the Office of Student Affairs, where they may face sanctions against them, such as probation, or expulsion from the University. It is up to my discretion as to which path I will take in dealing with an incidence of academic dishonesty.

Tentative **Lecture Schedule:**

Week of:	Monday	Wednesday	Friday
8/28 (1)	**Introduction & Diagnostic quiz**	**Chapter 2: Water** *Non-covalent interactions* Sect. 2.1-2.2	**Chapter 2: Water** *Water structure, buffers* Sect. 2.3-2.4
9/4 (2)	**Labor Day-No Class**	**Chapter 2: Water** *Buffers, macroions* Sect. 2.4-2.5	**Chapter 5: Amino Acids** *AAs, peptide bond* Sect. 5.1-5.2
9/11 (3)	**Chapter 5: Amino Acids** *Peptide bond, polypeptides* Sect. 5.2-5.3	**Chapter 5: Amino Acids** *Polypeptides* Sect. 5.3	**Chapter 6: Proteins** *Helices/sheets, fibrous proteins* Sect. 6.1-6.2
9/18 (4)	**Chapter 6: Proteins** *3˚structure* Sect. 6.3-6.4	**Chapter 6: Proteins** *Protein folding* Sect. 6.4-6.5	**Chapter 6: Proteins** *Protein folding, 4˚ structure* Sect. 6.5, 6.7
9/25 (5)	**Chapter 7: Protein Funct.** *Antibody structure/function* Sect. 7.1-7.3	**Exam #1:** **Chapters 1, 2, 5, 6**	**Chapter 7: Protein Funct.** *Myoglobin/Hemoglobin structure* Sect. 7.8-7.9
10/2 (6)	**Chapter 7: Protein Funct.** *Conformational changes and allostery of Mb/Hb* Sect. 7.10-7.11	**Chapter 7: Protein Funct.** *Hb variants* Sect. 7.14	**Chapter 8: Enzymes** *Enzymes as catalysts, reaction rates* Sect. 8.1-8.3
10/9 (7)	**Chapter 8: Enzymes** *Models for catalytic mechanisms* Sect. 8.4	**Chapter 8: Enzymes** *Chymotrypsin, cofactors* Sect. 8.4-8.5	**Chapter 8: Enzymes** *Michaelis-Menten kinetics* Sect. 8.6
10/16 (8)	**Chapter 8: Enzymes** *MM kinetics, inhibition* Sect. 8.6-8.7	**Chapter 8: Enzymes** *Inhibition and regulation* Sect. 8.7-8.9	**Chapter 9: Carbohydrates** *Monosaccharides* Sect. 9.1
10/23 (9)	**Chapter 9: Carbohydrates** *Drawing and derivatives* Sect. 9.2	**Chapter 9: Carbohydrates** *Oligosaccharides and polysaccharides* Sect. 9.3-9.4	**Chapter 9: Carbohydrates** *Polysaccharides and glycoproteins* Sect. 9.4-9.5
10/30(10)	**Chapter 10: Lipids and Membranes** *Types of lipids* Sect. 10.1	**Exam #2:** **Chapters: 7-9**	**Chapter 10: Lipids and Membranes** *Membrane lipids* Sect. 10.2
11/6 (11)	**Chapter 10: Lipids and Membranes** *Membrane properties* Sect. 10.3	**Chapter 10: Lipids and Membranes** *Diffusion and Facilitated transport* Sect. 10.4	**Veteran's Day-No Class**
11/13 (12)	**Chapter 10: Lipids and Membranes** *Active transport and Cotransport* Sect. 10.5, 10.7	**Chapter 10: Lipids and Membranes** *Neurotransmission* Sect. 10.8	**Chapter 4: Nucleic Acids** *1˚ Structure* Sect. 4.1-4.2

Week of:	Monday	Wednesday	Friday
11/20 (13)	**Chapter 4: Nucleic Acids** *2˚/3˚ Structure* Sect. 4.3	**Chapter 4: Nucleic Acids** *Alternative structures, denaturation* Sect. 4.4-4.5	**Thanksgiving Break, NO CLASS!**
11/27 (14)	**Chapter 3: Energetics** *Free energy* Sect. 3.1	**Exam #3:** **Chapters: 4,10**	**Chapter 3: Energetics** *Free energy* Sect. 3.2
12/4 (15)	**Chapter 3: Energetics** *Non-equilibrium conditions* Sect. 3.3	**Chapter 3: Energetics** *Free energy biological systems* Sect. 3.4	**Semester Wrap up**
12/11	**Final Exam Week**	**Comprehensive Final: 8-10 AM**	**Final Exam Week**