

The Chemistry of Living Things

CHM 109

Lecture Schedule/Syllabus

Fall 2007

Objectives: Students will develop an understanding of the chemical processes carried out by all living things. Students will demonstrate mastery of the material by solving written and lab problems on these topics and by being able to describe major chemical functions that living things perform. Emphasis is on kinetic and equilibrium approaches to solve problems.

This course is designed for non-science majors.

Instructor: Dr. Rick J. Krueger

E-mail rkrueger@uscupstate.edu web page: <http://faculty.uscupstate.edu/rkrueger/> phone# 503-5714

Office hours: Sm 406, Tu & Th 9:30-11:30 & W 11-12

Class Meetings: sect 001: Tu, Th 8-9:15, sect 002: Tu, Th 12:15-1:30 [Sm 413]

Required materials: *General, Organic, and Biochemistry, 5th ed.* by Denniston, Topping, and Caret, McGraw-Hill, 2007. ISBN 0-07-282847-1

Laboratory packet: *Chemistry 109 Lab Manual* available at the USC Upstate Bookstore

Class Organization: The purpose of the lecture is to present topics in sufficient detail for students to be able to solve basic chemistry and biochemistry problems. Recitation will be used both to present new material in the form of written modeling or problem based exercises and to **provide practice on problems** introduced in lecture. A minor aspect of recitation will involve review of previous laboratory work and brief introductions to future laboratory experiments. The laboratory exercises are used to reinforce the principles developed in lecture, and to acquaint students with some of the techniques used in a chemistry lab.

Recommendations for success in CHM 109

1. Read the assigned material ***before*** you come to lab/recitation/lecture.
2. Ask questions during lecture, recitation, and lab when you do not understand.
3. Do practice problems on web page and the assigned homework questions. **SI**
4. Get help with the questions you did not understand. **SI program!!!** Arielle McNeill
5. Go over the study guide 5-7 days before the exam. Allow enough time to develop ***understanding*** in weak areas identified from homework and the study guide.
6. Get help on study guide questions you did not understand. **SI program!!!**
7. Carefully review your graded exam when it is returned to you. If you still do not know how to answer an exam question at this stage, see me or others for help.

CHM 109 is likely to be a relatively labor intensive and to be different than other science courses you may have taken! How will it be different? _____

Lecture Schedule*

| <u>Week</u> | <u>Date</u> | <u>Topic</u> | <u>Reading</u> |
|---|-------------------|--|--------------------------------|
| 1 | 8/23 | Introduction; Outline; Science, Chemistry, Measurements, Math | <i>Chap 1</i> |
| 2 | 8/28 & 30 | More Math, Atomic Structure and Bonding (Orbitals, Periodicity) Bonding, Weak Interactions, States of Matter | <i>Chap 2</i> <i>Chap 4</i> |
| 3 | 9/4 & 6 | Mole/Stoichiometry, Solutions | <i>Chap 4</i> |
| 4 | 9/11 & 13 | Solutions, Chemical Reactions | <i>Chap 6</i> |
| 5 | 9/18 & 20 | Chemical Reactions (including Acid Base Chemistry), | |
| 6 | 9/25 & 27 | Finish Acid Base Chemistry, Start Kinetics <i>Exam I on 2/27, covering topics through Chemical Reactions</i> | <i>Chap 7</i> |
| 7 | 10/2 & 4 | Kinetics & Equilibrium | <i>Chap 7</i> |
| 8 | 10/9 & 11-12 | Equilibrium Fall Break, no classes! | |
| 9 | 10/16 & 18 | Equilibrium | |
| 10 | 10/23 & 25 | Introduction to Biochemistry & Water, Amino Acids and Proteins | <i>Chap 18</i> |
| 11 | 10/30 & 11/1 | <i>Exam II on 10/30 covering Kinetics-Biochemistry & Water</i> Amino Acids and Proteins | |
| Drop deadline = <u>11/1: last day to withdraw without penalty/change from credit to audit!</u> | | | |
| 12 | 11/6 & 8 | Amino Acids and Proteins & Enzymes | <i>Chap 19</i> |
| 13 | 11/13 & 15 | Carbohydrates & Lipids | <i>Chap 16-7</i> |
| 14 | 11/20 11/21-23 | Nucleic Acids, DNA: Replication, Repair, Protein Synthesis Thanksgiving Break, no classes! | <i>Chap 20</i> |
| 15 | 11/27 & 29 | Metabolism? | <i>Chap 21</i> |
| 16 | 12/4 & 6 | Finish DNA and course summary | 12/7: <i>Classes end.</i> |
| | 12/11 Tue | Cumulative Final Exam | sect 001: 8-11 AM |
| | 12/13 Thu | Cumulative Final Exam | sect 002: 11:30-2:30 AM |

*Disclaimer: If unforeseen circumstances occur, the syllabus may be changed.

Explanation of Grade Determination and Exam Structure

Grade determination. You will receive numerical grades for all of the work you do during the semester. The sum of these numerical grades will be used to assign the letter grade that goes on your transcript.

| <u>ACTIVITY</u> | <u>POINT VALUE</u> |
|-------------------|--------------------|
| Homework | 10 |
| Exam I | 18 |
| Exam II | 18 |
| Final Exam | 29 |
| <u>Laboratory</u> | <u>25</u> |
| Total | 100 |

Anticipated curve: A \geq 88, B+ \geq 85, B \geq 78, C+ \geq 75, C \geq 68, D+ \geq 65, D \geq 58

Homework, Exam, etc. details.

1. *Homework.* Homework assignments will usually have a value of 2 pts each. These assignments will be designed either to test your understanding of a subject or to test whether you can identify terms, figures, *etc.* that have been covered in the text or discussed in lecture. The policy for grade reduction on late homework is: 20% subtraction of credit for work that is less than 6 days late. No assignments will be accepted that are more than 6 days late.

2. *Exams I and II.* The main objective of these exams will be to test your understanding of the concepts and problems in the indicated chapters. Generally, the emphasis will be on problem solving, *not memorization*. However, for the more descriptive areas (e.g., metabolic processes), more memorization is required. If you have missed an exam for a legitimate reason, you will be permitted to take a *cumulative makeup exam* outside of lecture time during the week of 12/3. A legitimate reason for missing an exam would be physical illness (not just a runny nose) or severe emotional trauma, such as the death of a close relative. Documentation for your absence may be required. As soon as you suspect that you may not be able to take an exam, contact me by phone or e-mail to make sure that your absence from the exam is for an appropriate reason. **There is no option to drop either of the midterm exam grades.**

3. *Final exam.* The final exam will be cumulative, but will have a slightly heavier emphasis on weeks 12-16, since you will not have a midterm exam covering this material. It will generally emphasize problem solving and understanding more than memorization, but see above (#2) regarding the more descriptive subjects.

4. *Lab/recitation.* See lab/rec syllabus. Turning in a lab report for a lab you did not attend is considered a violation of the student honor code.

5. *Missed work.* Zero credit will be assigned when work is missed due to an unexcused absence.

Attendance:

Laboratory and recitation: Generally, you are expected to attend all laboratory and recitation meetings. The instructor for each lab/recitation section determines attendance guidelines. See the lab/recitation syllabus for your section for details. You are responsible for making up work for classes that you miss. See also the USC Upstate 2007-2008 Catalog.

Lecture: You are allowed to miss 4 lecture meetings without incurring any grade penalty. Starting with the 5th missed lecture and for each missed lecture after that, 1 point (*i.e.*, 1%) will be subtracted from your point total for the course. You will be counted as present if you are in class and participating for the entire class period. If you need to arrive at class late or leave early on a specific day see me to determine if your reason for missing part of class meets the criteria for an excused absence. You may be required to document the legitimacy of your absence. If you do not do this, you will be counted absent for the day. A sign-in sheet will be used to help track attendance. Signing-in for another student is considered a violation of the student honor code. See p. 3 concerning exams.

Some (probably not many) of the lectures will be videotaped. If you happen to miss class on one of these days, contact me if you wish to view the tape. Note that viewing this tape will not count as an attendance for a lecture you missed.

Electronic resources:

The usefulness and truthfulness of materials posted on the world wide web varies tremendously. While we will refer to some web resources, always consider the quality of the source when using it to draw conclusions.

Civility/Behavior guidelines:

Let's start with a definition from *Webster's New Universal Unabridged Dictionary, 2nd edition*, Dorset and Baber, 1983.

civility- politeness, consideration, courtesy.

All of these words imply that you are doing something with or in the presence of other people, and that you conduct yourself in a way that does not unduly inconvenience these other people.

Regarding getting along with other students: You have other students in class with you this semester. All students must conduct themselves in a manner that does not impede learning by other students in the class.

Items related to lecture and (usually) recitation:

1. Get to class on time. If you are late, try to sit near the door. Do not walk across the front of the room if seats are available in the back or sides.
2. When class starts, stop any conversation and turn your full attention to class.
3. I very seldom end class early or run over the allotted class time. Do not start shuffling papers, loading your book bag, *etc.*, before class ends. The noise disrupts class.
4. If you know that you will need to leave class early for any reason (e.g. doctor's appointment, childcare) sit near the door to minimize disruption when you leave.
5. Turn off all electronic devices (cell phones, beepers, watches, CD or tape players, *etc.*) that generate sound when you come into class. *Cell phone, pager, etc. use is prohibited during exams.* Do not even have them out on your desk.
6. Do not sleep in class. Even if you don't snore, this is rude. Sleeping, reading a newspaper or novel, or any activity other than being fully involved in the class is inappropriate.
7. Dress code: On exam days you may not wear sunglasses or a hat (an example would be a baseball cap) that has a bill or brim in the front. (I will allow exceptions for medical/religious reasons.) There are also safety-related dress requirements for lab (see safety video and lab packet).

Remember: The reason that all of this is necessary is that you are not the only student in class. The other students have paid a lot of money to be here. You are hurting their education and perhaps eventually their ability to make a living if you are disrupting class.

Regarding getting along with your instructors in CHM 109:

1. Please communicate, particularly if you don't understand or if something is bothering you. Outside of class, email will often get a more rapid reply from me than will phone calls.
2. a) **You are paying for part of my time, so use it, but please use it efficiently!!** Have your questions organized when you come to see me during office hours. The more efficiently you use my time, the more I will be able to help you.
 - b) While I encourage you to stop by my office any time you have questions, my job description is only 50% teaching. It is quite likely that I will have other commitments on Monday, Wednesday morning, and Friday afternoon. Please contact me in advance to make an appointment if you want to talk with me at those times.

Disability Issues

If you have (or suspect you have) an academically relevant disability, please see the Office of Disability Services to set up the paper work and make sure that we can accommodate your disability appropriately. Remember that you must have approval of the Disability Services Office for each semester, and you must discuss with them any services that you require for CHM 109.

Academic Honor Code Issues

The USC Upstate Honor Code can be found in the *USC Upstate Student Handbook*. Please refer to the *Handbook* if you are unfamiliar with the Code.

While the faculty anticipate that you will apply the Honor Code to all areas of the course, we have noticed in previous years that some laboratory reports do not appear to have been prepared independently. To clarify: 1) If you performed an experiment as part of a group, your data should be the same as other students in the group. 2) However, if a large amount of other portions of your lab report is identical to that of another student, the simplest explanation for this is that copying was involved in preparation of at least one of the reports. 3) Even if a question in the lab report asks for an answer that could be given by quoting the explanatory material given with the lab (or from the textbook), do not copy the answer verbatim. Even using quotes and a citation is not appropriate. Instead, restate the information in the answer using your own words.

If you have uncertainty at any time about whether a piece of work or particular activity might be a violation of the Student Honor Code, ask! For copying associated with lab reports, students usually receive a warning for the first offence. Depending on the nature of the first offence, credit for that work may be reduced. A second offence usually is taken first to Dean of Students and then Honor Court. In past semesters students have received an F for the entire course for a second violation associated with lab work.

Comments in lecture re. new grade: XF. Section will be added on this later.

Calculators and Proficiency in calculator use

We will supply the calculators that you will use for the two midterm exams and the final exam. You will have opportunities in recitation to practice using these calculators prior to the exams.