Integrated Chemistry

Chemistry 3: ~~Organic Reactions & Mechanisms~~
Equilibrium & Chemical Change
Fall 2013

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Office Hours: M. 12:30 - 2:00; Thurs. 9:00 - 10:30

Description. *Integrated Chemistry* is a four-term sequence that covers General Chemistry and Organic Chemistry. It provides a rigorous introduction to chemical principles for those students preparing for more advanced study in chemistry or for those who need a strong background in the field to pursue related disciplines such as biology, geology, physics or environmental science. It will also provide a good background for students preparing for careers in medicine.

This class is the third in the sequence and will focus on the nature of chemical equilibria and its role in chemical reactions, organic and inorganic. The class will have lecture/discussion meetings at which we will cover the major concepts of your reading assignments. Come prepared to ask questions and otherwise fully participate in these meetings. The laboratory will aim to develop your ability to think about how chemistry is actually practiced in the lab and to develop your laboratory skills, especially with respect to the techniques of organic chemistry. As such, we will occasionally perform labs not directly to the material being discussed in lecture.

The topics we will cover in this class are:

- Equilibrium (K&T - 16)
- Acid-Base Equilibria (K&T – 17 & 18)
- Entropy, Spontaneity & Gibb's Free Energy (K&T -19)
- Review of Equilibria & Kinetics (Jones – 8)
- Reactions of (and near) Carbonyl Groups (selections from Jones 16 - 19)

Assessment. Your performance in the class will be based on the following criteria:

attendance and class participation - participation in the lecture/discussions and labs is mandatory. If you will not be able to attend you need to let me know ahead of time and make arrangements to make up the missed material

review assignments - there will be a review assignments covering the material discussed in class or in the assigned readings. These will be collected and may (or may not) be rigorously graded. They are intended to help you by reinforcing key concepts and to make you aware of topics that you may be struggling with.

unit examinations, final exam - these will cover major points emphasized in class and may include essay questions or quantitative problems.

lab performance - completion of all labs is required, as is the maintenance of an acceptable laboratory notebook. Lab reports will not be required but substantive discussions need to be written in your lab notebooks for all experiments.

project design – Those of you proceeding on to Chemistry 4 will be expected to perform an independent, lab-based research project. To allow sufficient time to perform a project of sufficient sophistication you will need to plan the experimental work this term. You will be asked articulate a specific experimental question, design a suitable procedure, and assemble a list of necessary equipment and materials. You will be assessed on the clarity and detail of your proposal. Near the end of term, you will present your proposal, along with appropriate background theory, to the class in an oral presentation.

Textbooks & Materials:

Chemistry & Chemical Reactivity, 7th ed., J. C. Kotz & P. Treichel, 2009

Organic Chemistry, 4th ed., Jones & Fleming, 2010

Laboratory Notebook - a dedicated notebook, preferably a bound composition notebook, is required in laboratory. We will talk more about the keeping the lab notebook at our first lab meeting.

Safety Goggles - these are required at all times in lab. We have a few available in lab but you are encouraged to buy your own pair (get a comfortable pair) and bring them with you.
