Integrated Chemistry

Chemistry 4:The Nature of Materials
Spring 2015

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Office Hours: by appointment

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. The four courses are:

Chemistry 1: Chemical Principles: Organic Structure & Bonding
Chemistry 2: Organic Structure & Bonding & Reactivity
Chemistry 3: Equilibrium & Organic Reactions
Chemistry 4: The Nature of Materials

Chemistry 4 will focus on special topics that are particularly relevant to understanding some of the subtler aspects of matter. We will cover the following topics as well as others:

- Redox Chemistry & Electrochemistry
- Band Theory of Solids & Semiconductors; Organic Semiconductors
- Free Radicals and Their Reactions
- Aromatic Compounds and Electrophilic Aromatic Substitution
- Coordination and Organometallic Chemistry & Catalysis
- Photosynthesis: Artificial and Natural

Assessment. The assessment of your performance in the class will be based on the following criteria:

attendance and class participation - participation in the lecture/discussions is mandatory.

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 (but

probably will 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.

Papers & presentations: We will have several “mini-projects” and outside readings about which you will be asked to write response papers; in these you will investigate a question, for the projects, or summarize the main ideas of the readings, explaining particular points or otherwise analyzing the material. Specific instructions will be provided for each assignment. For each of these assignments two students will make an in-class presentation and lead a discussion of the material.

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