Course Syllabus
Chemistry 142
Spring 2010
Oxford College of Emory University

Class Meets MWF, 12:50-1:40, Wednesday 2:00-5:00, Room 223 Pierce

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Office Hours: Tuesday/Thursday (9:30-11:30 am), or by appointment

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Course Description

Chemistry 142 is the second course in a two-semester sequence for General Chemistry. This class, in conjunction with Chemistry 141, fulfills the introductory chemistry requirement for science majors and pre-health students at Emory College (Chemistry, Physics, Pre-med, etc.). It can also be taken by non-science majors to complete their laboratory science general education requirement at Oxford and Emory College. The topics covered in CHEM 142 include: 1) basic bonding principles of the transition elements; 2) properties of matter, particularly of the liquid and solid states; 3) properties of solutions; and 4) properties of general aqueous chemical reactions and acid-base reactions (including rates of reactions, equilibrium, solubility, thermodynamics, and electrochemical reactions).

Course Goals

The general goal of CHEM 142 is to complete your training in general chemistry, in particular gaining a more complete understanding of the properties of matter and the nature of chemical reactions. By successfully completing this course, you should be able to apply your understanding of the properties of matter and chemical reactions to organic reactions, which will be covered in CHEM 221-222, and you should be prepared to continue the more in-depth discussions of chemical reactions that you will encounter in physical chemistry (CHEM 300 and 331-332).

Student Learning Goals

Coordination chemistry (CH 24, sections 24.1, 24.3, 24.5)
1) Students will be able to predict the d-orbital splitting of coordination compounds.
2) Students will be able to explain differences in uv-vis absorption spectra for different coordination geometries.

Lliquid and solid states (CH 11)
Solutions (CH 12)
3) Students will be able to compare and contrast the properties of gases, liquids, and solids.
4) Students will be able to predict the nature of intermolecular forces for various types of compounds.
5) Students will be able to quantitatively describe the properties of solutes/solutions.

Rates of reactions (CH 13)
Equilibrium (CH 14)
6) Students will be able to quantitatively and qualitatively describe how reactions can be monitored, and how external changes affect reactions.

Acids-bases (CH 15)
Solubility and complex ion equilibrium (CH 16)
7) Students will be able to apply the concept of equilibrium in order to describe the pH of acid/base solutions (how much H3O+ is in solution), and the amount of solid that is dissolved

Thermodynamics (CH 17)
Electrochemistry (CH 18)
8) Students will be able to calculate the heat of reaction, the enthalpy of reaction, the voltage change for a redox reaction, and based on these criteria, whether a reaction is likely to occur or not.

Materials and Resources

•Textbook: Chemistry: Molecular Approach, by Nivaldo Tro (highly recommended)
•Accompanying student study guide and solutions manual (highly recommended)
•Carbon-copy lab notebook (required)
•Safety Glasses (required)
•Non-graphing scientific calculator (required)
•Blackboard Class Conference (https://classes.emory.edu)
•Emory email
•Learnlink conference (for general announcements from the chemistry department)

Grading

Your grade will be broken down into the following categories:

Exam 1 (Chapters 24, 11, 12)[1]	20%
Exam 2 (Chapters 13, 14, 15)[1]	20%
Exam 3 (Chapters 16, 17, 18)[1]	20%
Final Exam (cumulative)[2]	20%
Laboratories	20%

[1]Unannounced extra credit quizzes will be given in class about once per week. These quizzes will cover problems that have been recently covered in class, and these quizzes will allow you to accumulate extra credit points on your exams (note: this will be the only extra credit available for the exams).

[2]Your final exam can be used to replace your lowest exam grade, and will act as your makeup exam should you miss one of the semester exams due to absence

Laboratories

You will do 12 labs in the course of the semester. Formal reports will be required for 4 of these labs (3% of total grade each); each student will act as the "primary author" for at least one formal report, and then act as a "contributing author" for the remaining reports. Notebook sheets/calculations will be required for the remaining 8 labs (1% of total grade each). Guidelines for the lab formal reports, primary author and contributing author responsibilities, and notebook sheets will be provided in separate documents, and will be made available on the Blackboard course site.

Final letter grades will be assigned as shown below:

A	(93-100%)
A-	(90-92%)
B+	(87-89%)
B	(83-86%)
B-	(80-82%)
C+	(77-79%)
C	(73-76%)
C-	(70-72%)
D+	(67-69%)
D	(60-66%)

Honor Code

It is assumed that all Oxford College students will adhere to the highest standards of academic honesty and will uphold the Oxford College Honor Code.

Specific things to keep in mind for CHEM 142:

-you are expected to do your own work when taking an exam.
-only a non-programmable calculator, pencil, and other pre-approved documents are permitted in the exam.
-no cell phones are allowed in class during an exam period.
-all work handed in for lab is done as a group, however there is to be NO collaboration between lab groups for any formal report or problem sheet.
-any unoriginal idea or thought used in a laboratory assignment must be properly referenced.

It is my duty, according to the Honor Code, to report any incidences of misconduct to the Honor Council. Anyone who is found guilty of violating the Honor Code may receive a grade of F for the course. It is strongly recommended that each student carefully read through the Oxford College Student Honor Code.

Tentative Schedule (chapters from Tro text in parentheses)

Week 1: coordination chemistry (CH 24, sections 24.1, 24.3, 24.5)
Week 2: states of matter – liquid and solid state (CH 11)
Week 3: solutions (CH 12)
Exam I
Week 4: rates of reactions (CH 13)
Week 5: rates of reactions
Week 6: equilibrium (CH 14)
Week 7: acids-bases (CH 15)
Week 8: acids-bases
Week 9: acids-bases
Exam II
Week 10: solubility and complex ion equilibrium (CH 16)
Week 11: solubility and complex ion equilibrium
Week 12: thermodynamics and equilibrium (CH 17)
Week 13: thermodynamics and equilibrium
Week 14: electrochemistry (CH 18)
Exam III
Week 15: review
Final Exam: Tuesday, May 4, 7-10 pm