

## CHEMISTRY 36: SPRING SEMESTER, 2014

Lecture: MWF 10:40 – 11:30 a.m., Angell B112

“Recitation”: Problem sessions, quizzes, tests: Tues 5:30-8:15 p.m., Angell B112 (when announced)

**Instructor:** James Zahardis, PhD

**Office:** Cook A-219

**Email:** [jzahardi@uvm.edu](mailto:jzahardi@uvm.edu)

**Office Hours:** 12:00– 1:30 p.m. Monday and Wednesday or by appointment. These hours are subject to change with notice.

### Learning Goals

- 1) Develop a general knowledge of chemistry and be able to apply chemical and physical principles to solve a wide-range of problems in chemistry.
- 2) Develop proficiency in chemical laboratory techniques and apply these to realistic and current problems in research.

### Books

**Required Textbook:** Atkins, Jones and Laverman, *Chemical Principles: The Quest for Insight*, 6<sup>th</sup> edition, W.H. Freeman and Co., ISBN-10: 1-4292-8897-3. Lecture will closely follow this textbook. Most homework problems will be assigned from this textbook and will be similar to those on tests. I may assign other homework problems if needed, as well.

**Recommended Supplement:** Study Guide/Solution Manual for Chemical Principles, 6<sup>th</sup> edition. This study guide is available from Amazon and Barnes and Noble.

### Quizzes, Tests, and Final Exam

**Quizzes:** There will be a **quiz approximately every few weeks during recitation (i.e. Tues, starting at 5:30 pm.)** You should **bring a calculator**.

**Tests and Final:** There will be **6 tests** given during the semester: 3 ‘regular’ tests, an ACS exam (given twice), and the Final. **Each test, including the Final, will be worth 125 points and I will retain the four highest scores; however, the ACS exam can only count once.** All of these exams (except Final) will be held during the Recitation time (Tues night). If you do have a scheduling

conflict with any of these tests, please **notify me at least one class meeting in advance**. I will announce the test time in class (as well as on Blackboard) about 2 weeks before the exam. If you miss a test or exam, an official written documentation of sickness or family crisis is required. **Unexcused absences will result in a grade of zero for that exam. All tests will require a calculator that has log functions and their inverse functions.** You cannot access the internet, text message, or use the phone during tests or quizzes. You cannot use stored equations from your calculator or any libraries of information stored in its memory, etc. **I will provide a sheet with important equations.** You **should be able to algebraically manipulate these equations** to get them into a form to solve a particular problem. **Certain very basic equations will not be given**, which will be noted in lecture.

**Test Dates:** The following table gives *tentative* test dates. I will formally announce the test dates in lecture and on Blackboard about 2 weeks before the exam.

ACS Exam 1	Tues, Jan. 28 <sup>st</sup>
Test 1	Week of Feb. 24 <sup>th</sup>
Test 2	Week of March 17 <sup>th</sup>
Test 3	Week of April 7 <sup>th</sup>
ACS Exam	Week of April 21 <sup>st</sup>
Final	May 9 <sup>th</sup> , 10:30 a.m.-1:15 p.m. Angell B112

**Test Reviews:** I will provide a brief review for each test in the last lecture before the test.

**American Chemical Society (ACS) standardized exam:** This exam will be given in twice (January and April) during recitation. I will apply your percentile score to the ~125 points I will assign this test e.g. you get a percentile score of 80% then you earn 100 of 125 possible test points.

**Final Exam:** There will be a **comprehensive final** on May 9<sup>th</sup>. It will be same and carry the same approximate points as a normal exam (125 points). About half of the questions will deal with new material (i.e. came after test 3), and about half will be questions relating to material covered on Tests 1-3.

## LABORATORY

There is **no lab manual** for this course. Laboratory information will be posted on Blackboard. **Your TA (Erik Horak) is responsible for assigning points to the lab, which will account for 20% of your total points.** Below are some considerations for lab; your TA will provide more a more

detailed description during your first lab meeting. All labs are in **Cook A141 (T and R, 1:00-3:45 pm)** and the **first labs will be held on Jan. 28 and Jan. 30.**

**Lab Notebook:** A **bound composition notebook** is required. All **data must be recorded in blue or black ink.**

**Safety Goggles/Glasses:** Approved safety glasses or goggles must be worn by everyone once an experiment has started anywhere in the lab room. **Students not wearing who do not follow this rule will be given a zero for that experiment.** Prescription glasses may be worn under safety goggles only.

**Breakage Card:** Prior to the first lab, you must purchase a breakage card from the Chemistry stockroom, if you have not purchased one last semester. You need to have this card to do many of the experiments.

**Locks:** Record your locker combination (the stockroom charges money to look up this number).

**Attendance:** Your TA will take attendance in lab and report this to me. **If you miss more than two labs you receive an F for the entire course** and incompletes can only be granted by your academic dean. If you think you are going to miss lab let your TA (or me) know; we may be able to fit you into another section.

**Summary of Points:** The table below gives an *approximate* breakdown of points and percentages for different components of the course. If needed, I will readjust the points assigned by your TA in lab to fit into this scheme.

<b>Component</b>	<b>Percentage</b>	<b>Points</b>
Lab	20	160
6 Tests, including ACS and Final (I count the four highest, ACS will only counted once)	62.5	500
Quizzes	17.5	140
<b>Total Points</b>		800

**Topics Covered:** A significant portion of this class will focus on chemical equilibrium (Chapter 11) and its applications (Chapters 12-14). Significant emphasis will also be given to chemical kinetics (Chapter 15).

Chapter 9: Thermodynamics: 2<sup>nd</sup> and 3<sup>rd</sup> Laws

Chapter 10: Physical Equilibria

Chapter 11: Chemical Equilibrium

Chapter 12: Acids and Bases

Chapter 13: Aqueous Equilibria

Chapter 14: Electrochemistry

Chapter 15: Chemical Kinetics

Chapter 18: Nuclear Chemistry

If time permits: Other select topics that may include solid state chemistry, intermolecular forces, and polymers.