

Chemistry 116
Syllabus
Spring, 2013

Chemistry 116 is the second semester of a two-semester sequence on chemical principles. The course will begin with the laws of thermodynamics. All the standard thermodynamic functions (enthalpy, entropy, free energy, etc.) will be introduced and developed and applied to physical and then to chemical equilibria. A sophisticated treatment on multi-component aqueous equilibria will be given. This will include acid-base equilibria, solubility equilibria, complexation equilibria, and oxidation-reduction equilibria. The treatment will involve extensive use of distribution coefficients for speciation, logarithmic plots, computer calculations and graphics. Electrochemistry will be covered in connection with the discussion of oxidation-reduction equilibria. In each of these areas, we will apply thermodynamic principles to the relevant chemical phenomena. Some topics in chemical kinetics and spectroscopy may also be covered.

Instructor: R. Claude Woods, 262-2892, rcwoods@wisc.edu;
4337 Chemistry

Lectures: MWF 8:50 am, 2373 Chemistry

Office Hours: Make an appointment, or try just stopping by.
Appointments may be made immediately after a lecture, or if necessary, by e-mail.

Course Home Page: learn@UW

Text: D. W. Oxtoby, H.P. Gillis, and A. Campion, *Principles of Modern Chemistry* (Sixth Edition, Thomson Brooks/Cole, 2008). The material of Chapters 12-17 (and possibly parts of Chapters 18 and 20) is the subject matter of the course. Considerable additional material on these same subject areas that is not found in the textbook will also be covered in lecture.

Safety Goggles: You are required to wear safety goggles at all times when in the laboratory.

Problem Sets: You will receive problem sets at between one and two week intervals throughout the semester. The teaching assistants will grade your solutions and solution sets will be supplied after the problem sets are turned in. You may work with other students on the problems, but you must hand in and take responsibility for your own solutions. The problem set grades are counted in the final semester grade. More importantly the exams will be closely related to the problem work that has been assigned, so a firm grasp of the problem sets will be the highly important for doing well on the exams. It is required that students will use Mathcad software for many of the problems.

Laboratories: For the first six weeks of the semester, you will have scheduled laboratory periods on Thursdays. Further information on these will be provided elsewhere.

For the next eight weeks of the semester, you will work in faculty research labs for at least 8 hours per week. This experience will culminate in a written research report and a class presentation on your research project. Class presentations will occur during the Tuesday and Thursday laboratory and discussion times during the last week of class. All students are expected to attend the presentations of all of their classmates, except when they have an unavoidable conflict with another scheduled class.

Examinations: There will be three mid-term examinations and a final examination. The three mid-terms will be at 7:15 pm on dates to be given later and will last about two and a half hours

Conflicts: If a religious observance conflicts with any scheduled activity, please notify me. We will schedule a makeup or otherwise accommodate you.

<i>Grading:</i>	Three exams (120 points each)	360 points
	Final exam	240
	Problem sets	100
	First six weeks of lab	100
	Research laboratory work/report/presentation	200
	TOTAL	1000 points

A student must complete the laboratory, including the research project, to pass the course. Cut-offs for various final semester letter grades will be made at the end of the semester, but in no case will the final letter grades be in a different order than the above numerical totals. The instructor fully understands that the student group in this course has been highly selected and expects that the distribution of final letter grades will reflect this by being high. There are no predetermined numbers of any particular grades. The teaching staff will to the best of their ability assign letter grades that fairly and accurately correspond to each student's performance in the class. (In other words: If you make an A, you'll get an A.)