

***Chemistry 116 Syllabus***  
***Spring 2016***

Chemistry 116 is the second semester of a two-semester sequence on chemical principles. The course will begin with thermodynamics, and then apply thermodynamics to: basic physical equilibria, chemical equilibria, acids and bases, solubility/precipitation equilibria, and electrochemistry. Chemical kinetics will follow, as will special topics in materials chemistry, if time remains. Compared to Chem 115, we focus on macroscopic rather than microscopic descriptions of chemical systems, i.e., we focus on the behavior of a large number ( $N_A = 6 \times 10^{23}$ ) of atoms/molecules/ions.

*Instructor:* Mark Ediger, [ediger@chem.wisc.edu](mailto:ediger@chem.wisc.edu); 7303 Chemistry

*Class time:* MWF 8:50 am, 2373 Chemistry

*Office hours:* Tuesday 4:30 pm and Thursday 2:25 pm, other times by appointment, or try just stopping by

*Teaching assistant:* Kushal Bagchi, [kbagchi@wisc.edu](mailto:kbagchi@wisc.edu), Office hours in General TA office/desk 45: Monday 4:30 pm and Thursday 4:00 pm

*Text:* “Principles of Modern Chemistry”, 6<sup>th</sup> ed., by D.W. Oxtoby, H.P. Gillis, and A. Campion. I expect you to read the textbook before class. During our regular class periods, I will ask questions and you should be prepared to answer. Each student in the class will be a part of one of three groups, based on last names. On Mondays, I will call on Bremer – Michael; on Wednesdays, Mohan to Prestangen; on Fridays, Rider to Zeller.

*Labs:* For the first six weeks of the semester, you will meet in the teaching lab on *either* Tuesday or Thursday morning. You must come to laboratory prepared. Before coming to the lab, you must read and understand the procedure and complete the prelab assignment, if there is one. You must keep a laboratory notebook providing a detailed record of your primary data. A laboratory notebook with provision for making copies is required; your notebook from Chem 115 will suffice if enough pages remain. Instructions for preparing reports will be given in your lab manual.

For the next 8 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/Thursday morning laboratory times during the last week of class.

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

*Problem Sets:* You will receive a problem set about once per week. Problem sets will be due at the end of class on the designated day; late problem sets will not be accepted. The TA will grade your solutions to selected problems and provide solution sets. You should be prepared to discuss

the problems in your discussion section. I encourage you to work with other students on the problems, but you must hand in and take responsibility for your own solutions.

*Examinations:* There are three mid-term exams (7-9 pm) and a final exam, as listed in the course outline. *We will have 8:50 am class on exam days.* If you feel that a problem on the exam has not been graded correctly, you should contact the instructor or your TA within three days after receiving your exam.

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

<i>Grading:</i>	Three exams (@120 points each)	360 points
	Final exam	140
	Problem sets	200
	First six weeks of lab	150
	Research lab work/presentation	<u>150</u>
	TOTAL	1000 points

You must complete the laboratory to pass the course. There is no set quota of any particular grade and thus you are not competing with your classmates in this course. I will assign final course grades, in consultation with your teaching assistant, taking into account participation in class, discussion, and the laboratory.

### ***Course Outline -- Chemistry 116 Spring 2016***

Thermodynamic processes and thermochemistry (Chapter 12)  
Spontaneous processes and thermodynamic equilibrium (Chapter 13)

EXAM I                      7-9 pm                      Weds, Feb. 24

Chemical equilibrium (Chapter 14)  
Acid-base equilibrium (Chapter 15)

EXAM II                      7-9 pm                      Weds, Mar. 30

Solubility and precipitation equilibria (Chapter 16)  
Electrochemistry (Chapter 17)

EXAM III                      7-9 pm                      Weds, Apr. 27

Chemical Kinetics (Chapter 18)  
Other Topics  
Student Research Talks

FINAL EXAM                      12:25 pm                      Sunday, May 8