

Chemistry 0330
Fall2014
Section 2

Prof. Wesley Bernskoetter
GC 343; 3-3365

Lab Instructor: Dr. Li-Qiong Wang
GC 337; 3-2844

Important: In order to enroll in CHEM0330 you will need to either pass the placement exam (offered online starting 8/20/2014) in Banner (selfservice.brown.edu) *or* satisfy the prerequisites by passing CHEM0100, registered an AP Chemistry score of 4 or 5 with the university registrar, or completing an IB-Higher Level Chemistry exam. See the IntroChemFAQ document on the course website for more details. Questions regarding course admission should be directed to Sheila Quigley (Geochem Rm 203)

Students with little or no chemistry background should consider taking Chem0100 prior to enrolling in CHEM0330.

Lecture: Tuesdays and Thursdays 10:30a-11:50a; MacMillan Hall 117

Office Hours: *Instructor:* Tues & Fri 2:00 -3:30p; Additional instructor review sessions will be held the day(s) prior to each exam.

Description: The course conducts a systematic survey of the physical principles which govern chemical behavior and structure. The course discusses features such as thermodynamics, quantum mechanics, chemical kinetics, and molecular bonding models. The learning outcomes for the course include 1) a functional understanding of the relationship between physical thermodynamic principles and chemical behavior, and 2) the ability to make qualitative predictions or rationalizations regarding the structure of molecules.

Required Text: Zumdahl and Decoste. *Chemical Principles*. Seventh Edition.

Required Resource: The graded problem sets will be administered online via the Sapling Learning Online Homework. Each student will need purchase one-term of access to this system at a cost of \$40. Access may be purchased online or via access card available from the bookstore. Please follow the Sapling Startup instruction guide from the CHEM0330 Section 2 of Canvas to create your account. A *very* limited number of fee waivers are available for student in financial need. Please see Amy Cournoyer (Geochem Rm 239) about this assistance.

Additional Resources:

Science Center Tutoring Sessions

www.brown.edu/Administration/Dean_of_the_College/tutoring/

Canvas

Enrolled students login to Brown's online course support page at: www.brown.edu/it/canvas/. During the reading period the site is open to all students. The CHEM0330 Section 2 webpage will have relevant course info posted throughout the semester.

Dr. Suzanne Rudnicki Dr. Rudnicki will be available to students in both Dr. Wang's and Dr. Bernskoetter's sections who are seeking extra help in problem solving or in understanding the lecture materials. It is suggested (and beneficial for students) to begin seeking extra help BEFORE the first exam. She will be holding Open Office Hours: Monday and Wednesday 1:00pm – 3:00pm; Tuesday and Thursday 3:00pm – 4:30pm. Her office is Geochem 329.

Grading:

2 Hourly Exams	20% (each)
Final Exam	30% (comprehensive)
Online Problem Sets	10% (Tardiness excused only under University policy)
Lab Grade	20%

Two in class preliminary exams are scheduled for: **Tuesday, October 7th** and **Thursday, November 13th**. No make-up exams will be offered. The final exam is scheduled by the registrar for **Saturday, December 20th at 2:00pm**.

Students may bring calculators to all exams. The use of any other mobile electronic device with other capabilities is prohibited.

Those students with disabilities requiring additional accommodations should discuss their needs with Student and Employee Accessibility Services.
(http://www.brown.edu/Student_Services/Office_of_Student_Life/dss/)

Tentative Outline (36 lecture hours)

Course Administration and Introduction to Molecular Concepts (1 lecture hour)

I. Physical Foundations of Chemistry (13 lecture hours). A discussion of the key thermodynamic topics which describe chemical behavior. (Including chapters 6, 7, 9 & 10)

- A. The Laws of Thermodynamics
- B. Free Energy and Entropy
- C. Energy and Equilibrium Relations
- D. Applications of Equilibria

II. Molecular Structure and Chemical Reactions (22 lecture hours). A discussion of the interactions which build molecules from atoms and features of molecular dynamics. (Including chapters 12-15)

- A. Electronic Structure of Atoms

- B. Periodic Trends
- C. Valence Bond and VSEPR Bonding Perspectives
- D. Molecular Orbital Model for Bonding
- E. Reaction Rate Laws
- F. Determining Reaction Mechanism