Chemistry 1220
Fall 2007

Course: Principles of Chemistry II – Section 001 – CRN# 40534
Time/Location: MWF 1:30 – 2:20, W-007
Instructor: Stephen Bialkowski
Office: ML-359; **Phone**: 7-1907; **Electronic Mail**: Stephen.Bialkowski@usu.edu
Student Office Hours: M 2:30-3:30, W 3:00-4:00, or by appointment.
Required Text: T. L. Brown, H. E. LeMay, and B. E. Bursten *Chemistry: The Central Science* 10th Edition, Prentice Hall, Upper Saddle River, NJ **2006**
Prerequisites: Math 1050 or equivalent; Chem 1210 or equivalent
Recitation: You must be registered for a recitation section (CRN# 42833-42836). You will meet in recitation once each week to review material from the lectures.
Resource Room: Times and locations of the "Resource Room" will be announced during the first week of the term. These sessions are available on a walk-in basis to all general chemistry students.
Supplemental Instruction: Times and locations for meeting with the SI leader Brittany Woytko are: Monday 2:30-3:20 M-326; Wednesday 2:30-3:20 M-326; and Thursday 3:30-4:20 ESLC 046. Brittany will attend this class each day and is especially qualified to assist students. (brittwoytko@gmail.com)
Grading: A total of 600 points is possible in Chem 1220. Points are distributed as follows:

1st Hour Exam (Wednesday, September 26)	100 pts
2nd Hour Exam (Wednesday, October 24)	100 pts
3rd Hour Exam (Wednesday, November 28)	100 pts
Final Exam (Wednesday, December 12 1:30 – 3:30 PM)	200 pts
Recitation quizzes (best 7 of 9 offered)	100 pts
Total	**600 pts**

Tentative grade brackets: A/A- 100–88%; B-/B/B+ 87–77%; C-/C/C+ 76–60%; D/D+ 59–50%
Anyone missing one of the scheduled exams for legitimate reasons (with written documentation) will be eligible to take the comprehensive make-up exam, offered on Friday, November 30, by appointment. Make-up recitation quizzes will not be offered.
Course Provisions: The *Americans with Disabilities Act* mandates that reasonable accommodation will be made for students with disabilities in order to assure equal participation in Chem 1220. Students requesting such accommodation must meet me during the first week of classes and must coordinate such accommodations with the Disabilities Resource Center. The administration of Chem 1220 will adhere strictly to the academic regulations stipulated in the most recent Schedule of Classes and the USU General Catalog. Withdrawal from the course will follow official USU procedures.
Blackboard: I plan to utilize the "Blackboard" management system for Chem 1220. Registered students have access to Blackboard. Using a web browser, go to: **bb.usu.edu** Log on using your Banner A-number and password.
Learning Objectives: Chemistry 1220 is designed to prepare students to understand and solve quantitative problems in chemical kinetics, equilibrium, and thermodynamics. Acid-base reactions, pH, electrochemistry, and nuclear reactivity problems are addressed. Earth's environment issues are integrated into the coverage. Descriptive topics are presented to complete the knowledge of chemistry.
Assessment Statement: Class performance will be assessed relative to national norms through standard final examination.

Detailed Schedule, Fall 2007

DAY	DATE	#	TOPIC	CHAPTER	COMMENTS
M	8/27	1	Reaction Rates and Stoichiometry	14	No Recitation
W	8/29	2	1st and 2nd order - ½ lives	14	
F	8/31	3	Temperature and Rates	14	
M	9/3		**Labor Day – No Classes**		Recitation Cycle 1
W	9/5	4	Reaction Mechanisms, Catalysis	14	
F	9/7	5	Chemical Equilibrium	15	
M	9/10	6	Equilibrium Constants, K*eq* Calculation	15	Recitation Cycle 2
W	9/12	7	Applications, LeChatelier's Principle	15	
F	9/14	8	Bronsted Lowry, Autoionization of water	16	
M	9/17	9	pH scale, strong acids, strong bases	16	Recitation Cycle 3
W	9/19	10	Weak acids, weak bases, K*a*, K*b*	16	
F	9/21	11	Acid/Base, Salts, Lewis Acid/Base	16	
M	9/24	12	Review	14, 15, 16	
W	**9/26**		**EXAM 1 - Chapters 14, 15, and 16**		
F	9/28	13	Common Ions, Buffers	17	
M	10/1	14	Acid-Base titrations, Solubility Equilibrium	17	Recitation Cycle 4
W	10/3	15	Complex ions	17	
F	10/5	16	Precipitation	17	
M	10/8	17	Earth's Atmosphere, Photochemistry, Ozone	18	Recitation Cycle 5
W	10/10	18	Earth's oceans, freshwater, "green" chemistry	18	
F	10/12	19	Spontaneous processes	19	
M	10/15	20	Entropy and the 2nd Law of Thermodynamics	19	No Recitation Week
W	10/17	21	Entropy: Changes in Reactions	19	
F	10/19		Fall Break – No Classes		
M	10/22	22	Review	17, 18, 19	
W	**10/24**		**EXAM 2 - Chapters 17, 18, and 19**		
F	10/26	23	Gibb's Free Energy	20	
M	10/29	24	Oxidation/Reduction Reactions	20	Recitation Cycle 6
W	10/31	25	Spontaneity	20	
F	11/2	26	Concentration Effects on EMF	20	
M	11/5	27	Corrosion and Electrolysis	20	Recitation Cycle 7
W	11/7	28	Nuclear Transmutations & Rates of Decay	21	
F	11/9	29	Energy change in nuclear reactions	21	
M	11/12	30	Hydrogen and Halogens, Oxygen-Group	22	Recitation Cycle 8
W	11/14	31	Nitrogen, Carbon, and Boron Groups	22	
F	11/16	32	Review Al, Na, Fe, Cu	23	
M	11/19	33	Metal Properties	23	No Recitation Week
W-F	11/21-23		Thanksgiving Vacation		
M	11/26	34	Review	20, 21, 22	
W	**11/28**		**EXAM 3 - Chapters 20, 21, and 22**	23	
F	11/30	35	Coordination Complexes	24	
M	12/3	36	Color, Magnetism Properties	24	Recitation Cycle 9
W	12/5	37	Organic Molecules - Functional Groups	25	
F	12/7	38	Carbonyls, peptide bonds, proteins	25	
W			**Comprehensive Final Exam 1:30 – 3:30**		

Specific Learning Objectives: Chemistry 1220 is designed to prepare students to understand and solve quantitative problems in chemical kinetics, equilibrium, and thermodynamics. Acid-base reactions, pH, electrochemistry, and nuclear reactivity problems are addressed. Earth's environment issues are integrated into the coverage. A range of descriptive topics is presented to complete the course. Some specific objectives are:

- Deduce chemical structures given chemical composition.
- Discuss and apply concepts of chemical structure and bonding to predict chemical structure and chemical reactivity.
- Discuss the basic chemical components of living systems, including proteins, nucleic acids, lipids, and carbohydrates.
- Be able to relate the microscopic and macroscopic properties of matter to each other.
- Use physical and computational models to describe energies and forces in atoms and ions and explain the trends in the periodic table.
- Use the laws of thermodynamics to discuss and predict chemical reactivity and spontaneity.
- Apply concepts of resonance and inductive effects to predict the chemical and physical properties for different functional groups and the reactivity of molecules to which these functional groups are attached.
- Draw the Lewis structures including reasonable resonance structures and predict chemical properties for various compounds.
- Identify the various types of isomerism in organic and inorganic compounds, identify and classify chiral centers.
- Draw and interpret reaction coordinate diagrams, relate the energetic changes associated with chemical reactions to equilibrium constants and rate, and differentiate kinetic versus thermodynamic control of reactions.
- Describe the basic issues of nuclear chemistry and radioactivity.
- Explain the properties of water and its impact on chemical reactions.
- Develop and apply Molecular Orbital models of chemical bonding.
- Describe the features of carbohydrates, proteins, lipids, and nucleic acids.
- Classify compounds by structure, use the IUPAC nomenclature, and identify conformational effects.