Chemistry 102
Spring 2010 Course Guidelines

Instructor: Dr. Conrad Naleway
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Class/Lecture Hours: Flanner Hall 133
Office Hours: Tuesday & Wednesday 4-5pm and by appointment on MTh.
Optional Weekly Review Sessions: Time to be announced

Materials:

Text: Chemistry and Chemical Reactivity, Seventh Edition (2009) by Kotz, Treichel, and Townsend. Please note that the text is a secondary source of information to help clarify concepts presented in lecture. **The primary information is presented in class and also appears on website and lecture handout materials.**

Calculators will be needed for homework assignments and exams but do not need to be programmable, but should have log/trig functions (typically under $20)
Website: *www.geocities.com/conradnaleway/chem102* **(also found on LUC blackboard)**

This course will cover essential material of Chapters 14 - 20 and 23 of *Kotz/Treichel/ Townsend*
The topics will include:

1. Solutions and their Behavior	**(Chapter 14).**
2. Chemical kinetics, reaction rates, and reaction mechanisms	**(Chapter 15).**
3. Chemical equilibrium in gas and liquid phases	**(Chapter 16).**
4. Acids and bases, equilibrium in aqueous solutions	**(Chapter 17).**
5. Additional aspects of solution equilibria	**(Chapters 18).**
7. Chemical Thermodynamics: Entropy and Free Energy	**(Chapter 19).**
8. Electrochemistry and electron transfer reactions	**(Chapter 20).**
9. Nuclear chemistry	**(Chapter 23)** ***(selected topics)***
Special Topics in Chemistry	***Handouts***

Exams:

There will be three fifty-minute exams and one cumulative final exam. Each exam will consist of questions and problems representative of the text, lecture, and discussion material. A calculator, periodic table, and a **single page of *handwritten* notes** (8.5 x 11 inches, both sides) may be used during each exam.

The single page of notes must be included with the exam prior to hand-in. All exams must be signed in the front, upper right hand corner. This signature will be taken as a statement of honest and completely independent work. Instances of academic dishonesty will warrant immediate failure of the course plus referral to the Dean's office. For more information on university policy, please read:
http://www.luc.edu/cas/pdfs/CAS_Academic_Integrity_Statement_December_07.pdf

Exams will be graded and returned as soon as possible, usually the next class period. ALL grading questions, points of clarification and grading errors must be brought to the instructor's attention during office hours **no later than one week after exam is returned**. There will be no exceptions to this rule!

Exam Grade (80% of total grade) will be assigned according to the highest percentage computed by the two methods:

a) The average of the three 50 minute class exams, each weighing 1/3, plus completion of the final exam even though no included in grade. ***Please note that attendance and completion of the final exam are mandatory and a grade of at least 50% must be achieved in the final!***

b) The average of the top two 50 minute class exams plus the cumulative final. Thus the exams will weigh 1/3 each and the final will weigh 1/3. This relates to dropping the lowest in-class exam.

NOTE: Grade is NOT based upon a class curve. Thus individual performance determines one's grade and is not influenced by other's performance. This thus encourages each student to work collectively to help each other learn. Often discussing and working through a problem with someone else, helps one more than the other person, since it forces one to more critically see through a problem..

Homework Problem Sets (10%): Several sets of problems will be assigned during the semester, roughly one each week. These assignments will largely utilize the OWL homework system as well as the a few hand-outs.

Quizzes (10%):
Multiple quizzes will be given during discussion periods throughout the semester based on the text and lecture materials. Completion and hand-in of **each quiz** will warrant **one point of credit applied to the up-coming exam**.

Final Assignment of Grades will be based upon:

80% Exam Grade (Above)
10% Discussion Participation & Quizzes, and
10% Homework (OWL)

The following **grading scale** will be used:

90% - 100%	A
76% - 89%	B
60% - 75%	C
50% - 59%	D
< 50%	F

The aim of the grading policy is to allow time and incentive for improvement. Chemistry is not easy to learn, but the process can be rewarding if extensive, daily effort is made to master fundamentals as they appear. Students are urged to contact the instructor to discuss problems before they become serious.

Help/Review Sessions:
In preparation for exams, help/review sessions will be scheduled. Dates, times, and locations will be announced in class.

Xerox Materials:
There will be multiple hand-outs during the semester. These will include quizzes, problem sets, and old exams. Errors should be brought to the instructor's attention as soon as possible.

CHEMISTRY 102 (8:15 am MWF)

	Topic	Pages		Dates	
14	**Solutions and Their Behavior**	***616-655***			
	Solution Process		1	Wednesday, January 20, 2010	
	Saturated Solutions & Solubility		1	Wednesday, January 20, 2010	
	Factors Affecting Solubility		2	Friday, January 22, 2010	
	Ways of Expressing Concentration		3	Monday, January 25, 2010	
	Vapor Pressure(Clausius-Clapeyron Eq)		3	Monday, January 25, 2010	
	Phase Diagram & Colligative Properties		4,5	Wednesday, January 27, 2010	Friday, January 29, 2010
	Colloids		5	Friday, January 29, 2010	
15	**Chemical Kinetics**	***670-723***			
	Factors Affecting Reaction Rates		6	Monday, February 01, 2010	
	Reaction Rates		6	Monday, February 01, 2010	
	Concentration & Rates		7	Wednesday, February 03, 2010	
	Concentration with Time		8	Friday, February 05, 2010	
	Temperature & Rate (Arrhenius Eq)		8	Friday, February 05, 2010	
	Reaction Mechanisms		9,10	Monday, February 08, 2010	Wednesday, February 10, 2010
	Catalysis		10	Wednesday, February 10, 2010	
	EXAM 1		11	**Friday, February 12, 2010**	
16	**Chemical Equilibrium**	***724-759***			
	Concept of Equilibrium		12	Monday, February 15, 2010	
	Equilibrium Constant		12	Monday, February 15, 2010	
	Heterogeneous Equilibria		13	Wednesday, February 17, 2010	
	Calculating Equilibrium Constant		13,14	Wednesday, February 17, 2010	Friday, February 19, 2010
	Applications of Equilibrium Constant		14,15	Friday, February 19, 2010	Monday, February 22, 2010
	LeChatelier's Principle		16	Monday, February 22, 2010	
17	**Chemistry of Acid Base Equilibria**	***760-809***			
	Overview		17	Wednesday, February 24, 2010	
	Bronsted-Lowry Acids and Bases		17	Wednesday, February 24, 2010	
	Lewis Acids and Bases		17	Wednesday, February 24, 2010	
	Autoionization of Water		18	Friday, February 26, 2010	
	pH Scale		18	Friday, February 26, 2010	
	Strong Acids and Bases		18	Friday, February 26, 2010	

		Weak Acids				19-20	Monday, March 01, 2010	Wednesday, March 03, 2010
		Weak Bases				20	Wednesday, March 03, 2010	
		EXAM 2				21	**Friday, March 05, 2010**	
		SPRING BREAK					**March 8-12**	
		K_a and K_b				22	Monday, March 15, 2010	
		Salt Solutions				23	Wednesday, March 17, 2010	
18	**Other Aspects of Aqueous Equilibria**				***810-859***			
		Common-Ion Effect				24	Friday, March 19, 2010	
		Buffers				24	Friday, March 19, 2010	
		Acid Base Titrations				25	Monday, March 22, 2010	
		Solubility Equilibria				26	Wednesday, March 24, 2010	
		Factors Affecting Solubility				26	Wednesday, March 24, 2010	
		Precipitation				27	Friday, March 26, 2010	
		Qualitative Analysis				27	Friday, March 26, 2010	
19	**Chemical Thermodynamics(Entropy & Free Energy)**				***860-895***			
		Spontaneous Processes				28	Monday, March 29, 2010	
		Entropy and Second Law				28	Monday, March 29, 2010	
		EXAM 3				29	**Wednesday, March 31, 2010**	
		EASTER BREAK					**Friday, April 02, 2010**	**Monday, April 05, 2010**
		Molecular Interpretation of Entropy				30	Wednesday, April 07, 2010	
		Chemical Reactions & Entropy				30	Wednesday, April 07, 2010	
		Gibbs Free Energy				31	Monday, April 12, 2010	
		Free Energy and Temperature				31	Monday, April 12, 2010	
		Free Energy and Equilibria				31	Monday, April 12, 2010	

20	**Electrochemistry(Electron Transfer Reactions)**					***896-947***			
		Oxidation Reduction					32	Wednesday, April 14, 2010	
		Balancing Redox Equations					32	Wednesday, April 14, 2010	
		Voltaic Cell					33	Friday, April 16, 2010	
		Cell EMF					34	Monday, April 19, 2010	
		Spontaneity of Redox Reactions					34	Monday, April 19, 2010	
		Concentration effect on EMF					35	Wednesday, April 21, 2010	
		Batteries					35	Wednesday, April 21, 2010	
		Corrosion					36	Friday, April 23, 2010	
		Electroylsis					36	Friday, April 23, 2010	
23	**Nuclear Chemistry**					***1060-1095***			
		Radioactivity					37	Monday, April 26, 2010	
		Nuclear Stability					38	Wednesday, April 28, 2010	
		Nuclear Transmutations					38	Wednesday, April 28, 2010	
		Rates of Decay					38	Wednesday, April 28, 2010	
		REVIEW					39	Friday, April 30, 2010	
		FINAL EXAM						**Monday, May 10, 2010**	