

**I. Instructors:**

	<b>Sections</b>	<b>Office</b>	<b>Email: @uwosh.edu</b>
Dr. Yijun Tang	Lecture (all) Discussion (1,2,4) Laboratory (2)	HS-442	tangy
Dr. Jonathan Gutow	Discussion (3) Laboratory (3)	HS-412	gutow
Dr. George Olsen	Laboratory (1, 4)	HS-444	olsengp

Office Hours: Will be announced at each instructor's first course meeting. First seek your own instructor for help with any part of the course. If your instructor is not available, feel free to get help from any of the course instructors.

**II. Materials:**

Text: Chemistry, 10<sup>th</sup> Edition, by R. Chang, McGraw Hill Publishing.

Lab Manual: Chem 106: General Chemistry II Laboratory Manual, Fall 2011.

Lab Notebook: You are encouraged to use your Chem 105 lab notebook. Otherwise, the lab notebook must be bound and have DUPLICATE pages. Spiral bound notebooks are NOT acceptable.

Calculator: Any make with scientific notation, powers, roots, and logs. You must have your own calculator in exams.

Goggles: Indirect vented safety goggles are required for admission to the first lab period. State law requires that goggles be worn at all times during the lab. They are available at the bookstore and from the UW Oshkosh Chemistry Club.

Clicker: eInstrument clickers will be used in the lectures. Clickers are available at the university bookstore. Register to the class at [www.einstruction.com](http://www.einstruction.com) after September 5, 2011.

Class Name: General Chemistry II

Class Key: L68024B922

You may be asked for an activation code when register. If you do not have one, a free coupon will be distributed on the first day of class. You need only ONE code for all courses in one semester.

**III. Grading System:****A. Attendance**

An **unexcused** absence during a scheduled quiz or examination in any part of the course will result in a zero point score for that quiz or exam. Excuses for absence from a lecture, examination, quiz, or laboratory session must be presented to your instructor, in advance if possible. Assignments and tests missed for a valid reason will not be counted against you, but you will be responsible for material covered in your absence. Make-up for excused absences will be at the discretion of your instructor. Advance notice of a pending absence will often make it possible to arrange for an alternate time for a quiz or attendance in another laboratory section.

**B. Grade Distribution**

Exams (4 × 100 pts) .....	400
Discussion Quiz (10 × 10 pts) .....	100
Homework (10 × 10 pts) .....	100
Laboratory (10 × 20 pts) .....	200
In-class clicker questions .....	50

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**Total: 850**

**C. Grading Scale**

<b>Letter</b>	<b>Overall Percent</b>
A,A-	> 87%
B+,B,B-	87 – 75%
C+,C,C-	75 – 63%*
D+,D,D-	63 – 50%
F	< 50%

\* It should be noted that you must get a C or better to continue onto other courses with this course as a prerequisite.

**Failing the laboratory component (see next section) will result in a failing grade for the course regardless of your overall score.**

**D. Laboratory Grade**

Only those individuals with approved absences (i.e. verified illness, an absence due to University business, etc.) will be allowed to make up a missed laboratory assignment. Students who miss a laboratory due to an excused absence should make arrangements to make-up the laboratory as soon as possible in any section possible with approval of the laboratory instructor for that particular section. These points will be assigned based on your attendance, work on pre-laboratory exercises, performance in the laboratory and results presentation.

**In order to pass the class you must successfully pass the laboratory component of the course with greater than 50% of the points available (>100 points). Failure to turn in both laboratory reports will constitute a failure in the laboratory component of this course.**

## E. Discussion Grade

Attendance at discussion is **mandatory** and you are expected to attend the section for which you are registered. Any long range schedule conflict must be resolved with the course coordinator.

A weekly ten (10) point quiz will be given during the last portion of the discussion period. It will focus on the subjects for that week but will also tend to be cumulative since that is the nature of the subject of chemistry. Failure to take AT LEAST 8 quizzes will result in zeroes being entered into your quiz average.

Online homework assignments will also be provided throughout the semester. It is your responsibility to gain access to the homework site and to complete the assignments before the due date. There will be 10 weekly assignments due on Mondays at 6:00pm. The first assignment is due on Monday September 19<sup>th</sup>.

## IV. Course Policies:

Misgraded quizzes or exams must be returned to your instructor for possible regrading no later than one week following their return. You should save all tests, quizzes, and lab reports so that you will have them available for review, and so that any chance of clerical error may be avoided.

It is your responsibility to check the exam score, quiz score, and attendance printouts to determine that your score was entered properly. Any error must be reported within a week of the posting date of the printout in order for it to be considered.

A WORD TO THE WISE: The two most common reasons for a poor grade in this course are the failure to keep up with the work on a daily or weekly basis, and excessive absences from lecture and/or discussion. In general, if you attend all parts of the course, read the text, complete and understand the weekly problem assignments (discussion and homework) and lab experiments, you will pass the course. If you study in addition to that, you should do better. If you experience difficulty with any part of the course, seek help immediately. If you let it slide, it becomes more difficult to catch up because the subject matter tends to be cumulative.

NOTE: The last date to drop this course without a Late Add/Drop Request Form is **the Friday, OCTOBER 21<sup>st</sup>**. Students dropping the course must check out of lab before the drop is considered complete.

**V. Course Objectives:**

This course is intended to introduce the student to the language and the elementary theories of chemistry, to provide training and practice in analytical reasoning and problem solving, and to serve as the basis for further studies in chemistry. The laboratory portion is designed to provide training in the experimental techniques of chemistry, and to reinforce lecture material with concrete experience.

Specific areas in which the student is expected to achieve minimal competency by the end of the semester are the following:

- CHEMICAL REACTIONS:** Review of classical chemical reactions, appropriate reaction format and definitions, balancing metathesis (ionic) reactions, precipitation and solubility rules.
- THERMODYNAMICS:** Internal energy, heat, work, enthalpy, the Laws of Thermodynamics, spontaneity, entropy, and free energy.
- KINETICS:** Reaction rates, rate laws and reaction orders, half-life, reaction mechanisms, the Arrhenius Equation, and catalysis.
- EQUILIBRIA:** The definition of equilibrium, equilibrium constants, factors affecting equilibria and LeChatlier's Principle.
- ACIDS AND BASES:** Acid-base concepts including definitions, strength, pH scale, equilibria, salt dissociation, and calculations involving solution equilibria. Additionally, uses and applications of aqueous equilibria will be presented.
- ELECTROCHEMISTRY:** Electrolytic and Galvanic cells, cell potentials, standard reduction potentials, thermodynamics and its relation to electrochemistry, equilibria and cell design, Nernst equation, and batteries.
- TRANSITION METALS:** Properties of the transition metals and their coordination compounds including color, magnetic properties, oxidation states, and bonding theories.

## Lecture Schedule

Week No.	Beginning	Tuesday	Thursday	Exam Coverage*
1	9/5		Ch. 12	
2	9/12	Ch. 12	Ch. 12	
3	9/19	Ch. 13	Ch. 13	
4	9/26	Ch. 13	Rev. Ch. 6	
5	10/3	Ch. 18	Ch. 18	Monday: Ch. 12, 13
6	10/10	Ch. 18	Ch. 14	
7**	10/17	Ch. 14	Ch. 8.6	
8	10/24	Ch. 15	Ch 15	
9	10/31	Ch. 15	Ch. 15	Monday: Ch. 14, 18
10	11/7	Ch. 16	Ch. 16	
11	11/14	Ch. 4.2	Ch. 16	
12	11/21	Exam 3	Thanksgiving Break	Tuesday: Ch. 15, 16
13	11/28	Ch. 19	Ch. 19	
14	12/5	Ch. 19	Ch. 22	
15	12/12	Ch. 22	-	Wednesday: Ch. 19, 22

\* All exams will be held at the Testing Center in the basement of Polk Library. Bring your calculators. You are not allowed to borrow or lend calculators during an exam.

\*\* Last day to drop without Late Add/Drop Request Form is October 21, 2011.

Lecture may deviate slightly from this schedule, but Exams will be given as scheduled except for an emergency.

### Exam Dates:

- Exam 1: Monday, October 3.**  
**Exam 2: Monday, October 31.**  
**Exam 3: Tuesday, November 22.**  
**Exam 4: Wednesday, December 14.**

**Laboratory Schedule**

<b>Week (begins on Thursdays)</b>	<b>Experiment</b>
9/8 – 9/14	Laboratory Check-in, Laboratory Safety Review, Laboratory Report Review & Laboratory Measurement Review
9/15 – 9/21	Properties of Gases
9/22 – 9/28	Determination of Molecular Weight by Freezing Point Depression
9/29 – 10/5	Kinetics
10/6 – 10/12	Kinetics (continued)*
10/13 – 10/19	Formation Constant of a Complex Ion
10/20 – 10/26	Determination of an Acid Dissociation Constant
10/27 – 11/2	Acid/Base Studies
11/3 – 11/9	Acid/Base Studies (continued)*
11/10 – 11/16	Electrochemistry
11/17 – 11/23	Coordination Compound (Synthesis)
11/24 – 11/30	Thanksgiving Break
12/1 – 12/7	Coordination Compound Studies (Characterization)
12/8 – 12/14	Evaluation and Laboratory Check-out

\* *A complete laboratory report is required for these experiments*

## Discussion Assignments

Week No.	Begins	Quiz	Chapters	Homework Due*
1	9/5		Syllabus, 6	
2	9/12	D 1	12	
3	9/19	D 2	12, 13	HW 1
4	9/26	D 3	13	HW 2
5	10/3 [Exam 1]		13	
6	10/10	D 4	18	HW 3
7	10/17	D 5	14	HW 4
8	10/24	D 6	8.6, 15	HW 5
9	10/31 [Exam 2]		15	
10	11/7	D 7	15, 16	HW 6
11	11/14	D 8	16, 4.2	HW 7
12	11/21 [Exam 3]	Thanksgiving Break		
13	11/28	D 9	16, 19	HW 8
14	12/5	D 10	19, 22	HW 9
15	12/12 [Exam 4]	-	-	HW 10

*\*You need a Quest account for your homework. More information can be found at*

*<http://web4.cns.utexas.edu/quest/support/student/>.*

*The unique number of this course is "Chem106".*

*\*Homework is due on Monday 6:00pm.*

### Solubility Rules For Ionic Compounds In Water

#### I. Salts that are soluble:

1. All common compounds of Group 1A ions ( $\text{Li}^+$ ,  $\text{Na}^+$ , etc.) and the ammonium ion ( $\text{NH}_4^+$ ).
2. All common compounds of nitrates ( $\text{NO}_3^-$ ), acetates ( $\text{C}_2\text{H}_3\text{O}_2^-$ ), chlorates ( $\text{ClO}_3^-$ ) and perchlorates ( $\text{ClO}_4^-$ ).

#### II. Salts that are generally soluble with some exceptions:

1. All common compounds of chlorides ( $\text{Cl}^-$ ), bromides ( $\text{Br}^-$ ) and iodides ( $\text{I}^-$ ) **except** those of  $\text{Ag}^+$ ,  $\text{Pb}^{2+}$ ,  $\text{Cu}^+$  and  $\text{Hg}_2^{2+}$ . All common compounds of fluoride ( $\text{F}^-$ ) **except** those of  $\text{Pb}^{2+}$  and Group 2A ( $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Ba}^{2+}$ , etc.).
2. All common compounds of sulfates ( $\text{SO}_4^{2-}$ ) **except** those of  $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$ ,  $\text{Ag}^+$  and  $\text{Pb}^{2+}$ .

#### III. Salts that are generally insoluble with exceptions:

1. All common metal hydroxides are insoluble **except** those of Group 1A and the larger members of Group 2A (beginning with  $\text{Ca}^{2+}$ . Note that this is also true for metal oxides which in the presence of water produce metal hydroxides).
2. All common compounds of carbonates ( $\text{CO}_3^{2-}$ ), phosphates ( $\text{PO}_4^{3-}$ ) and sulfites ( $\text{SO}_3^{2-}$ ) **except** those of Group 1A and the  $\text{NH}_4^+$  ion.
3. All common compounds of sulfides ( $\text{S}^{2-}$ ) **except** those of Group 1A, Group 2A and the  $\text{NH}_4^+$  ion.

Common Polyatomic Ions			
Cations			
$\text{NH}_4^+$	Ammonium	$\text{H}_3\text{O}^+$	Hydronium
Anions			
$\text{C}_2\text{H}_3\text{O}_2^-$	Acetate	$\text{CO}_3^{2-}$	Carbonate
$\text{ClO}_3^-$	Chlorate	$\text{ClO}_2^-$	Chlorite
$\text{CrO}_4^{2-}$	Chromate	$\text{CN}^-$	Cyanide
$\text{Cr}_2\text{O}_7^{2-}$	Dichromate	$\text{OH}^-$	Hydroxide
$\text{OCl}^-$	Hypochlorite	$\text{NO}_3^-$	Nitrate
$\text{NO}_2^-$	Nitrite	$\text{C}_2\text{O}_4^{2-}$	Oxalate
$\text{ClO}_4^-$	Perchlorate	$\text{MnO}_4^-$	Permanganate
$\text{SO}_4^{2-}$	Sulfate	$\text{SO}_3^{2-}$	Sulfite
$\text{PO}_4^{3-}$	Phosphate		