

CHEM 102/106 Syllabus – Spring 2015

Course Code: CHEM 102 and CHEM 106  
Course Title (credits): Chemistry Lecture (3) and Lab (1)  
Term and Year: Spring 2014  
Course Ref. No. (CRN): CHEM102: 10046  
CHEM106 Section 1: 10048

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Lecture Meeting Time: TTh 7:00-8:15 PM  
Lecture Location: TCES 206  
Lab Meeting Time: Section 1: Th 2:30 PM – 5:15 PM  
Lab Location: TCES202

Prerequisites: MATH100 or higher  
Corequisites: CHEM 101 and CHEM 105

**Course Description:**

CHEM 102: Continues the study of the structure and properties of matter. Topics include the behaviors of solids, liquids, and solutions, chemical kinetics, equilibrium phenomena, entropy and free energy, electrochemistry, and nuclear chemistry.

CHEM 106: Continues the development of chemical laboratory skills with experiments in chromatography, freezing point depression, Beers Law and its applications to kinetics and equilibrium measurements, Le Chatelier's principle, titrations of weak acids and bases, and measurements of simple electrochemical cells.

**Student Outcomes:**

Students successfully completing these courses will demonstrate the following:

- Understanding of fundamental chemistry concepts sufficient to solve complex word problems.
- Ability to successfully answer questions regarding chemical nomenclature, reaction mechanisms and molecular properties in formats similar to common standardized tests such as the MCAT and GRE.
- Competence in basic chemistry lab techniques and safety, including the ability to write and follow a laboratory procedure using standard operating procedures.
- Competence in maintaining laboratory notebooks and ability to write laboratory reports.

### **Methods for Assessing Student Outcomes:**

Weekly quizzes on chapter learning objectives, cumulative and a comprehensive final exam will be used to assess student knowledge and competence. Written laboratory reports will be assigned to evaluate student mastery of laboratory techniques and concepts.

### **Learning Strategies:**

Chemistry II and Lab will use texts oriented to understanding concepts and problem solving, lectures, assigned homework problems for each chapter, class problem solving sessions. In laboratory exercises, students must prepare a laboratory plan, keep a notebook of laboratory results, and compile a laboratory report to communicate a body of knowledge, concepts, and skills related to general chemistry and scientific research. Student study groups outside of class time are highly encouraged.

### **Instructional Texts:**

CHEM 102:

1. Tro, N. *Chemistry: A Molecular Approach*. 3<sup>rd</sup> edition. (ISBN 0321809246)

CHEM 106:

1. Vincent, J. J. and Erica J. Livingston. *Lab Manual for Chemistry: a Molecular Approach*. 3<sup>rd</sup> edition. (ISBN 0321813774)

### **Attendance:**

Attendance will not be graded. HOWEVER, any higher education course demands a substantial time commitment, chemistry courses more than most. Missing a lecture will result in forfeiture of credit for any in-class work. Laboratory reports will only be accepted from students who have completed the lab exercise. Laboratory exercises may be made up at the discretion of the instructor. Acceptable excuses include, but are not limited to, illness (of the student or a dependent) with a physician's note, military duty or family bereavement. Oversleeping or conflicting employment schedules are NOT acceptable excuses.

### **Sanctions for Academic Dishonesty:**

For a comprehensive definition of what is considered cheating or plagiarism, please refer to the Sierra Nevada College Course Catalog. In short, academic dishonesty is representing another's work or thoughts as your own or fabricating results. For the first offense, the student receives a zero for assignment/exam and/or a determination by the faculty if the student should fail the course is made. Counseling with faculty on the honor code, consequences for violating the honor code, and the value of academic honesty in learning are provided. In the event of a second offense, the student will be expelled.

### **Special Accommodations (ADA) Statement:**

"In accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, students with a documented disability are eligible for support services and accommodations. If a student

wishes to request an accommodation, contact the Director of Student Services (Prim Library room 323) at (775) 831-7799 x7534 within the first week of the semester.”

### **Grading Policy:**

Identical letter grades will be awarded in CHEM 102 and CHEM 106 according to standard grading conventions as follows. A: >90%, B: 80-90%, C: 70-80%, D: 60-70%, F: <60%. Plus and minus grades will awarded accordingly. Grades will be determined as follows:

Weekly Quizzes:	30%
Application Problems:	30%
Laboratory Reports:	20%
Final Exam:	20%

Weekly Quizzes: Quizzes will be given every week on the material covered in the previously covered chapters. The quizzes will be broken up into discrete learning objectives pulled directly from the textbook and in-class example problems. Each learning objective will be graded out of 4 points can be taken up to four weeks in a row. If a student receives two “4” scores, they receive an overall grade of 5 points on the objective. More information on this scoring system will be given in class.

Application Problems: One homework problem will be assigned each week, and will be due in class one week after it is assigned. These problems will be graded just like an exam question, and will be a cumulative problem based on the material that was covered in the previous week.

Final Exam: the Final Exam will be comprehensive. The format will be a comprehensive take-home exam focusing on combining concepts and will be due at the scheduled final exam slot as scheduled by SNC.

Lab Reports: The format of Lab Reports will be discussed during the first lab session. Students will be allowed to drop the scores of two lab reports from their final grade in order to account for absences and unforeseen circumstances. Please, DO NOT skip lab exercises just because you can; you might end up needing to miss lab for unforeseen circumstances later in the semester.

Due Dates and Late Work: Assignments (Homework, Lab Reports and Exam Adjustments) are due at the beginning of class the day they are due. Once class has started, assignments are docked 10% of the total points possible. Every day following, the assignments lose an additional 10%, to a minimum of 50% credit.

**Advice from a Former Student:** Be present and awake in class and lab. I know it’s not possible to pay attention every minute of every lecture, but I will provide plenty of opportunities for students to discuss material during class, which should help you absorb the material and stay awake. Try not to fall behind, as that will impact your ability to comprehend the new material being presented. Do not be afraid to ask me or others for help with difficult concepts, but put a significant amount of time into the problem before you come to office hours if you want to get anything out of it.

**The instructor reserves the right to change this syllabus at any time if it is in the best interests of the students.**

**Tentative Course Schedule**

WEEK	DAY	DATE	TOPICS	QUIZ CHAPTERS	Lab
1	T	Jan 20	Molecular Geometries	N/A	Math Review and Safety Information
	TH	Jan 22	Orbital Theory		
2	T	Jan 27	Intermolecular Forces	10	Exp 13: VSEPR Models
	TH	Jan 29	Phase Changes		
3	T	Feb 03	Phase Changes	10, 11	Exp 15A: Chromatography
	TH	Feb 05	Solutions		
4	T	Feb 10	Colligative Properties	11	Exp 16: Sublimation
	TH	Feb 12	Solubility		
5	T	Feb 17	Chemical Rates	12	Exp 17: Freezing Point Depression
	TH	Feb 19	Factors Affecting Rates		
6	T	Feb 24	Determining Rate Laws	12, 13	Exp 18A: Diet Coke and Mentos
	TH	Feb 26	Practice with Rates		
7	T	Mar 03	Chemical Equilibria	13	Exp 19: Measuring Equilibrium
	TH	Mar 05	Le Châtelier's Principle		
8	T	Mar 10	Acids and Bases	14	Exp 21: Acid/Base Titration
	TH	Mar 12	Acid/Base Equilibria		
	T	Mar 17	Spring Break		
	TH	Mar 19			
9	T	Mar 24	Titrations	14, 15	Exp 21: Titration Calculations
	TH	Mar 26	Buffers		
10	T	Mar 31	Precipitation Reactions	15, 16	Exp 22: Measuring Buffer Capacity
	TH	Apr 02	Spontaneity in Reactions		
11	T	Apr 07	Thermodynamics	16	Exp 20: Oscillating Systems
	TH	Apr 09	Free Energy (isn't)		
12	T	Apr 14	Electrochemistry	17	Exp 23: Effects of Entropy
	TH	Apr 16	Oxidation States		
13	T	Apr 21	Voltaic Cells	17, 18	Exp 25: Radioactivity (data provided)
	TH	Apr 23	Radioactivity		
14	T	Apr 28	Nuclear Reactions	18, 19	Determination of an Unknown (handout)
	TH	Apr 30	Special Topics: TBD		
15	T	May 05	Final Review	19	No Lab
	TH	May 07	No Class (Final Prep)		
16	T	May 12	11:30 AM Final Exam	10-19	