

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: 10272 CHEM106: 10145

Instructor: Sean Ryland
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Office hours: 2:00-4:00 PM Th and by appointment

Lecture Meeting Time: T-Th 8:30-9:45 PM
Lecture Location: TCES 202
Lab Meeting Time: T 2:30-5:15 PM
Location: TCES 202

Prerequisites: CHEM 101
Corequisites: CHEM 102 and CHEM 106

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 explain the concepts to other scientifically-minded individuals.
- 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 homework assignments, two hour-long exams 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*. 3rd edition. (ISBN 0321809246)

CHEM 106:

1. Vincent, J. J. and Erica J. Livingston. *Lab Manual for Chemistry: a Molecular Approach*. 3rd 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 can 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 Accomodations (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:

Homework:	30%
Exams:	20%
Laboratory Reports:	20%
Final Exam:	30%

Homework: Homework will be assigned and collected weekly. Through the appendices at the end of the text and the solutions manual, answers for every homework question are available. PLEASE use these resources as a means of evaluating your own understanding. DO NOT copy answers blindly from these sources; if you do so, not only is it obvious to the instructor, you are undermining your own success in the class.

Exams: Exams will be given with at least two weeks notice, but it is recommended that students study and complete homework assignments at all times. Make up exams may be given at the instructor's discretion, but only in the most extreme cases. After **one** exam, a student can choose to complete a blank exam outside of class in order to add one third the number points missed on the exam to the exam score. For instance, a student who scored a 70% on an exam who can complete the exam outside of class will receive a readjusted score of 80% for that exam. The retaken exam must be filled out 100% correctly in order to receive any additional credit. This exam adjustment cannot be used for an exam for which the student was not present.

Final Exam: the Final Exam will be comprehensive. The format will be similar to the previous exams and will be administered 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 skip lab for unforeseen circumstances later in the

semester. Students who complete all lab reports will be allowed to average the percentage of their two worst lab report scores instead of taking the laboratory final.

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%. Assignments more than 5 days late will not be accepted.

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.

Acknowledgements:

Thanks to Dr. Tom Clarke for the use of his syllabi in crafting this syllabus.

WEEK	DAY	DATE	TOPICS	CHAPTERS	Lab
1	T	1/21	Lewis Structure Review	9	Exp 15A: Chromatography
	TH	1/23	Molecular Geometries	10	
2	T	1/28	Orbital Theory	10	TBD
	TH	1/30	Intermolecular Forces	11	
3	T	2/4	Phase Changes	11	Exp 16: Sublimation
	TH	2/6	Solutions	12	
4	T	2/11	Colligative Properties	12	Exp 17: Freezing Point Depression
	TH	2/13	Exam #1 Review	9-12	
5	T	2/18	EXAM #1	9-12	TBD
	TH	2/20	Chemical Rates	13	
6	T	2/25	Factors Affecting Rates	13	Exp 18A: Diet Coke and Mentos
	TH	2/27	Determining Rate Laws	13	
7	T	3/4	Chemical Equilibria	14	Exp 19: Measuring Equilibrium
	TH	3/6	Predicting Reactions	14	
8	T	3/11	Acids and Bases	15	Exp 21: Acid/Base Titration
	TH	3/13	Acid/Base Equilibria	15	
	T	3/18	Spring Break		
	TH	3/20			
9	T	3/25	Buffers	16	Exp 22: Measuring Buffer Capacity
	TH	3/27	Precipitation	16	
10	T	4/1	Exam #2 Review	13-16	Exp 20: Oscillating Systems
	TH	4/3	EXAM #2	13-16	
11	T	4/8	Thermodynamics	17	Exp 23: Effects of Entropy
	TH	4/10	Free Energy (isn't)	17	
12	T	4/15	Electrochemistry	18	TBD
	TH	4/17	Voltaic Cells	18	
13	T	4/22	Radioactivity	19	Exp 25: Radioactivity (data provided)
	TH	4/24	Nuclear Reactions	19	
14	T	4/29	TBD	TBD	Determination of an Unknown (handout)
	TH	5/1	Exam #3 Review		
15	T	5/6	EXAM #3	17-19	Final Review
	TH	5/8	No Class		
Finals	S	5/13	Final Exam 8:00- 11:00 AM (Chapters 9-19)		