

SIERRA NEVADA COLLEGE
CHEM 101/105 Syllabus – Fall 2015

Course Code: CHEM 101 and CHEM 105
Course Title (credits): Chemistry Lecture (3) and Lab (1)
Term and Year: Fall 2015
Course Ref. No. (CRN): CHEM101: 80110
CHEM105: 80111

Instructor: Jamie Orr, Ph.D
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Office: TCES Second Floor

Lecture Meeting Time: TTh 4:00-5:15 PM
Lecture Location: TCES 202
Lab Meeting Time: Th 1:00 PM - 3:45 PM
Lab Location: TCES202

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

Course Description:

CHEM 101: An introduction to the structure and properties of matter. Topics include the atomic theory of matter, reaction stoichiometry, acid/base chemistry, redox reactions, an introduction to thermodynamics, the fundamentals of quantum mechanics and their applications to chemical structure and bonding, and the properties of gases.

CHEM 105: Complements CHEM101 with an introduction to the basic laboratory techniques of chemistry. Experiments include measurements of conductivity, titration, calorimetry, quantitative analysis, exploration of the gas laws, and derivation of the activity series of metals. Virtual labs are also used to demonstrate the basic experiments underlying the atomic theory of matter and modern quantum mechanics.

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, quizzes, two midterm 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 I 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 101:

Tro, N. *Chemistry: A Molecular Approach*. 3rd edition. (ISBN 0321809246)

CHEM 106:

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 may be made up at the discretion of the instructor, but are not guaranteed. 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 ADA & Section 504 of the Rehabilitation Act of 1973, students with a documented disability are eligible for support services & accommodations. If a student wishes to request an accommodation, contact Henry Conover, ADA Compliance Officer (Prim Library room 323), at (775) 831-1314 x7534 or by email at hconover@sierranevada.edu 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 be awarded accordingly. Grades will be determined as follows:

Problem Sets:	30%
Quizzes & Exams:	30%
Laboratory:	20%
Final Exam:	20%

Problem Sets: These will be assigned and collected weekly and often worked on in class. 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. Credit will only be given for solutions with all work shown.

Quizzes & Exams: Quizzes may be given at any time, but will be based directly upon recent homework assignments and will be reviewed in class immediately following the quiz. 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. Exam corrections will be assigned as homework and graded for up to 1/2-credit back on any missed problems.

Final Exam: The Final Exam will be comprehensive. The format will be similar to the midterm 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 just because you can.

Due Dates & 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.

Some Friendly Advice: Be present and awake in class and lab. I know it's not possible to pay attention every minute of every lecture (although coffee helps), but I will provide plenty of opportunities for students to discuss material during class, which should help you absorb the material and stay awake. I may even make students run around the classroom or have an atomic dance off if it's a particularly sleepy day. 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, it's likely that you are not the only one with difficulty. Ask questions, help answer them. And in the words of the illustrious Ms. Frizzle: "Take Chances, Make Mistakes, Get Messy!"

Acknowledgements:

Thanks to Sean Ryland via Dr. Tom Clarke for the use of their syllabi for reference. (Always cite your sources!)

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

Tentative Course Schedule

Week	Date	Reading	Topics & Assignments	Laboratory Exercises
1	8/18 8/20	Chapter 1	The Nature of Matter, The Scientific Method	Lab 1: Laboratory Basics & Safety
2	8/25 8/27	Chapter 1	Units, Measurements, & Uncertainty Unit Conversions and Problem Solving	Lab 2: Experimental Design
3	9/1 9/3	Chapter 2	Discovery of Atoms & Electrons The Periodic Table & Atomic Structure	Lab 3: Components of a Mixture
4	9/8 9/10	Chapter 3	Molecules & Compounds Chemical Reactions	Lab 4: Chemical Reactions
5	9/15 9/17	Chapter 4	Chemical Quantities & Concentrations Stoichiometry & Limiting Reagents	Lab 5: Avogadro's Number
6	9/22 9/24	Chapter 5	Gases & Gas Laws Applications of the Ideal Gas Law	Lab 6: Gas Laws
7	9/29 10/1	Chapter 6	Energy & Chemistry Heat & Enthalpy	Lab 7: Calorimetry
8	10/6 10/8	N/A	Exam Review Midterm Exam Chapter 1-6	Lab 8: TBD
9	10/13 10/15	Chapter 7	Light & Quantum Physics Electrons & Orbitals	Lab 9: Equivalent Weights
10	10/20 10/22	Chapter 8	Electron Configuration Atomic Properties	Lab 10: Atomic Spectra
11	10/27 10/29	Chapter 8 Chapter 9	*10/26 Last Day to Change Grade Status or Withdraw w/out Academic Penalty* Periodic Trends Chemical Bonding & Lewis Models	Lab 11: Reactivity of Metals
12	11/3 11/5	Chapter 9	Types of Bonding Bond Energies	Lab 12: Flame Tests
13	11/10 11/12	Chapter 10	Orbital Shapes & VSEPR Models Molecular Orbital Theory	Lab 13: VSEPR/Molecular Models
14	11/17 11/19		Exam Review Midterm Exam Chapters 7-10	Lab 14: TBD
15	11/24 11/26	--- Thanksgiving Break ---		
16	12/1 12/3		Special Topics	Exam Review
Final	12/11	3:00-6:00 PM	Final Exam	