

GENERAL ENGLISH A1.1

Chm 11500--Fall 2015

Instructor

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I am only on campus on Mondays, Wednesdays, and most Fridays. If you have a question and cannot come to my office hours please send me an email. I check my email daily in the morning and will try to reply to your mail ASAP.

This syllabus may be subject to change. Any change will be announced to the class.

Office Hours

M,W 11am-12 pm, F 10:30-11:30am

Or by appointment if necessary

Lecture: Gyte-107 , M W 9:30-10:50am

Materials: Silberberg, Chemistry: The Molecular Nature of Matter and Change, special edition. The special PUC edition of the text is available at the bookstore where you may purchase either the hardcover text + electronic text + homework access code OR the electronic text + homework access code. Earlier versions of the Silberberg text are fine to use if you have those. Keep in mind that the hardcover text doesn't include Ch 21, but you can print it out from the electronic version that comes with it. If you purchase the text without a new homework access code, please read about homework below. Bring a calculator to class every day and to lab. In-class instructions will be given for the TI-83-91 programmable calculators, although any calculator is allowed.

Laboratory Notebook: Composition Notebook. Manually paginate in upper right hand corner 1-60 after the Table of Contents. Do not tear pages out. Write on the right side pages only.

Lab Supplies: Lab manual, goggles, 1 permanent marker, 1 partial roll of paper towels and a lock.

Laboratory: Concurrent registration required.

Prerequisites: High School Chemistry or equivalent and passed math placement. Please notify me if you have never taken a high school chemistry course.

COURSE DESCRIPTION: Chm 11500 introduces the laws and principles of chemistry, with special emphasis on topics in science and engineering. Numerical problems and relationships are introduced whenever quantitative treatment is possible.

OBJECTIVE: The student will gain an understanding of the fundamentals of chemistry- elements, compounds, chemical reactions, stoichiometry, molecular geometry, gases, atomic structure, periodic relationships, solid state, thermochemistry, and thermodynamics.

LECTURE ATTENDANCE: Prepare yourself by reading the text sections **before** class and attending all lectures. Each student is responsible for all the material presented in the lecture which augments the material in the book, and indicates the depth and breadth of material to learn. If you miss a class, please get the class notes from a classmate and see me during office hours to clarify any questions regarding the material. Keep in mind that

chemistry is a rigorous discipline that requires mastery of preceding material to fully understand future material. You will profit greatly by keeping up to date with the problems assigned and by reading ahead in the text. Attendance is not mandatory but highly recommended.

Be considerate of others: turn off cell phones and keep talk to a minimum.

LABORATORY: Laboratory information is provided on the Blackboard site. The lab schedule and exercises must be brought to lab. The material for the first week will be provided. Also bring goggles, composition notebook, lock, Sharpie pen and a partial roll of paper towels to the first lab. Clothing must cover the skin from the shoulders to the knees and feet. **No sandals, shorts or sleeveless tops allowed in lab.**

NOTE: Absences from the first two labs without informing the instructor will result in **administrative withdrawal** at the discretion of the instructor. Absences from any three labs without informing the instructor will result in **administrative withdrawal** at the discretion of the instructor.

HOMEWORK: The homework will be completed online. Access to the online homework must be paid to the online vendor or purchased at the bookstore. Instructions are on the Blackboard for this material under CONNECT. During the first two weeks of class, the homework vendor will release a trial subscription for your use, in case your book funds haven't materialized. Your work done during the trial period will be appended to your paid subscription so you won't lose your work.

The homework is an excellent method to help you master the material. Plan on spending **several hours** per week on the homework. In addition to the 10 tries for each question, each homework will have two attempts, so if you want to try the homework again, you may and you will receive the better of your two scores. Every student has one homework deadline extension upon email request to the instructor. Any additional extensions may be granted for extenuating circumstances at the discretion of the instructor.

STUDENTS WITH DISABILITIES:

Students who may need accommodations due to disability should contact the Office of Disability Resources (ODR) to discuss specific needs. The ODR is located on the third floor of the Student Union & Library Building, Room 341. If accommodations for a student are approved by that office, the student must provide his/her instructor with a copy of the official accommodations letter as soon as it is received in order to obtain accommodations. Students may contact the Office of Disability Resources by calling 219-989-2455 or emailing odr@purduecal.edu.

EMERGENCY PREPAREDNESS

In case of emergency, please notify call 911. In addition, an information sheet with instructions for various types of possible emergencies, is posted in each room on campus. These possibilities include criminal activity, fire, medical emergencies, and noises sounding like gunshots. Students are strongly encouraged to review this instruction sheet carefully and acquaint themselves with these important guidelines.

COURSE OUTLINE:

Aug 24,26	Orientation and Ch 1 Introduction
August 26	Ch 2 Matter
August 31, Sept 2,9	Ch 3 Stoichiometry
Exam I Sept 14	Ch 1-3
Sept 16,21,23	Ch 4 Chemical Reactions
Sept 28,30, Oct 5	Ch 5 Gases
Oct 7,14	Ch 6 Thermochemistry
Fall break Oct 12-13	
Exam II Oct 19	Ch 4-6
Oct 21,26,28	Ch 7 Quantum Theory and Atomic Structure
Nov 2,4	Ch 8 Electron Configuration and Chemical Periodicity
Nov 9,11	Ch 9 Chemical Bonding
Exam III Nov 16	Ch 7-9
Nov 18,23,30	Ch 10 Shapes of Molecules
Thanksgiving Holiday Nov 25-27	
Dec 2,7	Ch 11 Covalent Bonding
Dec 9	Review
Dec 14 at 8am	Final exam (cumulative)

Final Exam Mon. Dec. 14 8-10am (note this is not the usual class time). For the final exam 75 points will cover chapters 10 and 11 and 75 points are cumulative over the semester's material.

GRADING AND EXAMINATIONS: Scores from the top four of five quizzes (20 points each), weighted percent score the lab, scores from homework problems (10 points per chapter), three exams (100 pts each), and the final exam (150 pts) will be used to calculate your grade.

Lecture quizzes usually will be given online and announced a few days in advance. The lowest lecture quiz score will be dropped. **No make-up quizzes** are given. The lab score will be explained in lab. Two unexcused absences from the lab is reason to initiate administrative withdrawal of the student. The overall lab score will be reported as a percentage, which will be multiplied by 2.0 for the lab score and incorporated into the overall grade for the course.

Homework is to be completed online by the due dates listed on the homework. I will give each student only one extension on the due date for one chapter unless there are extenuating circumstances. The online homework checks your answer and if it isn't correct, you will be informed and allowed to try again and again; however, each successive attempt may be penalized. After you have completed the homework, you are allowed one more attempt which allows you to do the homework over. You might enjoy working in small groups or with the SI on the homework.

For exams, calculators are allowed provided they do not have a keypad or transmission capabilities. No translators are allow, but ask the instructor if a term is unfamiliar and the instructor might provide a definition. Exams are graded carefully. If you wish to have a question on your exam regraded, inform the instructor immediately after class. The problem in question should be circled and the number listed on the front page with a brief explanation of the concern. There are no make-up exams. If you miss an exam, you will receive a zero for the exam. At the end of the semester you will be able to take the ACS standardized exam over the semester's material during check out

week in lab. The transformed score from this exam will be substituted for the lowest exam score, if the ACS score is higher. This score can replace a missing exam. There is no penalty for a low score on the ACS exam.

Giving or receiving unauthorized aid is strictly forbidden. When doubt exists concerning aid, ask if it is permitted. For example, doing homework problems in a group is not only allowed, it is encouraged; however, writing the lab report is each student's responsibility. Rewording another person's lab report is plagiarism and no credit will be given to either of the parties. Any act of dishonesty during a quiz, exam, or in the lab will be penalized at the discretion of the instructor.

Special lecture events and extra credit assignments will be mentioned in class. For example, extra credit may be given for special group activities or attending a special lecture.

All students are held accountable to the Honor Pledge. Any academic dishonesty will be dealt with according to University Policy (see handbook).

The grading scheme is listed below.

Quizzes	80
Labs	200 (lab % multiplied by 2.0)
Homework	110
Exams I, II, and III	300
<u>Final</u>	<u>150</u>
Total	840 pts

The assignment of grades will be based on total percentage of points earned. The scale representing the minimum percentage of points needed is below.

A 85% and above; B 75% and above; C 65% and above; D 50% and above; F below 50%

Keep your personal record of points and refer to the gradebook for this ecourse.

		Earned/total
Quiz	___ ___ ___ ___ ___	___/80 (drop lowest)
Homework	___ ___ ___ ___ ___ ___ ___ ___ ___ ___	___/110
Exams	___ ___ ___	___/300
Lab	___ % multiply by 2	___/200
Final	___	___/150
Extra Credit and bonuses	___ ___	___
Total		<hr/> _____/840 total pts

HOMEWORK ASSIGNMENT AND EXAM CONCEPTS AND OPERATIONAL SKILLS

(or What the Exams will Cover)

Chapter 1 Skills

Identify physical and chemical properties and physical and chemical changes.
Recognize and apply the scientific method.
Quantify uncertainty in measurements, use significant figures correctly in calculations.
Distinguish between accuracy and precision.
Determine the relative accuracy of glassware.
Perform density calculations.
Convert measurement units eg., temperatures, cm^3 to L, mg to g, mass to moles.

Chapter 2 Skills

Identify elements, compounds (ionic and covalent), and mixtures.
Know the correct spelling and symbols for the first 54 elements.
Identify groups and regions of the periodic table.
Determine the number of protons, neutrons, electrons, and the charge of any species.
Name and write formulas for ionic and covalent compounds.
Use isotopic mass and fractional abundance to determine molar mass.
Determine molar masses from atomic mass unit.
Design a method to separate a mixture into compounds.

Chapter 3 Skills

Understand the meaning of mole.
Determine mole (from mass, concentration and volume), number information from balanced chemical equations.
Use stoichiometry to convert moles.
Determine the limiting reagent and percent yield.
Determine or use percent composition, empirical formula, and molecular formula.
Learn names and formulas of chemicals.
Balance chemical equations.
Determine concentration of solutions and species.
Dilute samples to specific concentrations.
Complete a reaction table for a balanced reaction.

Chapter 4 Skills

Recognize acids and bases and classify as strong or weak.
Write the name and formula of an anion from the acid.
Identify electrolytes.
Write molecular, ionic, and net ionic equations.
Recognize spectator ions.
Predict reaction products from ionic reactants.
Balance combustion reactions.
Determine oxidation number of an element, oxidizing agent, and reducing agent.
Balance redox reactions.
Determine the concentration of dilutions.

Chapter 6 Skills

Distinguish whether processes are exothermic or endothermic.
Calculate calorimetry values (heat, mass, specific heat, heat capacity, temperatures).
Calculate enthalpy using Hess' Law and standard enthalpies of formation.
Manipulate thermochemical equations.
Distinguish types and sources of energy.
Identify state functions
Calculate the change in energy due to heat and work

Chapter 5 Skills

Use the ideal gas law to solve problems.
Derive and use two state equations to solve problems.
Incorporate gas density or molecular weight into the ideal gas equation.
Calculate the partial pressure and mole fractions of a gas in a mixture.
Calculate the amount of gas collected over water.
Use Graham's Law of Effusion.
Predict the behavior of real gases.
Use the van der Waals equation.
Use kinetic-molecular theory to explain gas behavior.
Describe the energy of activation.
Relate reaction stoichiometry to ideal gas conditions.

Chapter 7 Skills

Interconvert wavelength and frequency.
Calculate the energy or wavelength of a photon.
Use the rules for quantum numbers.
Describe atomic orbitals.
Describe orbital energy levels.
Use the Rydberg equation in calculations.

Chapter 8 Skills

Determine electron configurations of atoms and ions and apply Hund's rule.
Apply periodic trends (ionization energy, electron affinity, ionic radius, halogen oxidation).
Explain periodic trends in terms of nuclear charge, shielding, effective nuclear charge, orbital, quantum number.
Predict paramagnetism and diamagnetism.
Predict the chemical properties of elements in a group.

Chapter 9 Skills

Know periodic trends in electronegativities.
Use electronegativities to obtain relative bond polarities.
Write Lewis electron-dot symbols.
Recognize bonding and nonbonding forces.
Describe metallic bonding.
Relate bond order and bond length.
Estimate enthalpy change from bond energy.
Use the Born-Haber cycle to calculate various enthalpies.

Chapter 10 Skills

Predict molecular geometries.

Write resonance formulas.

Use formal charges to determine the best Lewis formula.

Relate dipole moment and molecular geometry.

Calculate the heat of reaction from bond energies.

Chapter 11 Skills

Determine orbital hybrids, describe sigma and pi bond composition and shape.

Describe multiple bonds.

Use MO theory to predict stability and bonding.

Contrast and compare MO theory to valence bond theory.