**CHEM 3A Summer 2013: Introductory General Chemistry**

**Section # 720002 MTWTh Lab 7:00-9:05 am in PHY82. Lecture 9:15-11:20 in PHY 76**

**Section # 720003 MTWTh Lecture 9:15-11:20 in PHY 76. Lab 11:30-1:35 pm in PHY 82**

**INSTRUCTORS:** MRS. V. CORNEL (first 3 weeks) and MR. SCOTT HODGES (last 3 weeks)

**E-MAIL ADDRESS:** vmcornel3@verizon.net andscott.hodges@fresnocitycollege.edu using "CHEM3A" in subject line

**PHONE:** 638-3641 **EXT.:** 3449 (Cornel)

**WEBSITES:** <http://blackboard.reedleycollege.edu>

**TUTORING:** Free tutoring available in the Tutorial Center (by the library)

**REQUIRED ITEMS:**

TEXT: H. NIVALDO J. TRO, “Introductory Chemistry Essentials” 3rd or 4th edition (no Mastering Chemistry CD needed)

LAB BOOK and NOTES: Print copies of the labs and fill-in notes posted weekly on Blackboard

INTERNET ACCESS and COLLEGE E-MAIL ADDRESS (can forward to your personal address)

SCIENTIFIC CALCULATOR: Exponential and log functions ($12 at Walmart), but don't buy a programmable calculator as you will not be allowed to use it in exams.

LAB SUPPLIES: safety glasses ($5 at hardware store), old shirt or labcoat

**PREREQUISITE:** Math 103 or equivalent. Students need to be familiar with algebra as there is a lot of math involved in the course.

**ADVISORY:** English 1A, CHEM10 or high school chemistry

**LECTURE NOTES:**

The ability to listen carefully and to take good lecture notes in an essential college skill. Students should print out the fill-in notes, homework and lab assignments off my Blackboard website prior to coming to class. Studies have shown that 90% of the lecture material is retained if you review the lecture within 24 hours after class. If you wait a week you will only retain 35%.

**HOMEWORK**

Homework will be assigned every lecture. It is essential to your success in this class that you do all the assigned homework and read the relevant sections in your Textbook. All homework will be collected at the beginning of the following lecture and selected problems graded. This is to ensure that you work consistently and can apply what you learn to problems. There will be no make-up homework assignments, but I will drop the lowest four homework assignments. Do not just copy somebody else’s homework or you will not be able to do the problems for yourself in the exams. You can ask another student or tutor to help you start some problems, but you need to work them out for yourself. Even if you get all the problems wrong, you will still get 70% for the assignment for attempting all the problems yourself and showing all your work. You will learn where you are going wrong when I go over the homework. The latest I will accept homework is just before I hand back the graded homework the next lecture. This is not ideal as you won’t have your homework in front of you when I go over it and you will lose 10% for the homework being late. Absence is not an excuse for not doing your homework as you can send it in with another student, or count that assignment as one you drop. If you leave the class or are disruptive while I go over homework, I will also deduct points. It is advisable to write out the homework questions as well as the answers so you can study your homework.

You can also do the corresponding odd number problems for extra practice and check the answers at the back of the book.

**GRADING SCALE**

The overall student grade is calculated based upon a weighted average as shown below.

 **Title** **Percentage**

6 Exams\* 50 %

1 Comprehensive Final Exam\*\* 15 %

Homework, Pre-Lecture Quizzes (weeks 3-6), Participation 10 %

Labs, Lab Quizzes and study guides\*\*\* 25 %

*\*If a student has a valid excuse for missing an exam, the final will count twice, once as the final and once for the missed exam. No make-up exams will be given.*

*\*\* The student must score 50 % or better on the comprehensive final exam to pass the class.*

*\*\*\* The student must earn an overall lab score of 60% or better. A score of less than 60 % in laboratory will result in a grade of F regardless of the score within lecture.*

The overall letter grade will be calculated according to the following scale. *A curve may be used.*

The grading scale to be used is **A** 90-100%, **B** 80-89%, **C** 70-79%, **D** 60-69%, **F** 0-59%

**LAB REPORTS**

The lab reports are a significant portion of your overall grade. Most of the lab reports are due on the day the lab is completed. Most of the labs require completion of a pre-lab before the day of the lab. Students will not be allowed to participate in these labs if the pre-labs are not completed before the beginning of the labs. Students are required to follow all lab policies as outlined in the safety agreement.

**EXAMINATIONS**

For the first 3 weeks the exams will be short answers and problems. No scantrons will be needed.

For weeks 4-6 each student is required to bring their own SCANTRON 882 for each exam. Each exam will consist of approximately 30 multiple choice questions based upon definitions, concepts, and fundamental calculations. Exam problems are based on the lab write-ups, homework, lecture and reading. Extra time will not be allowed for the exams. The final exam used will be the American Chemical Society standardized exam which is multiple choice and comprehensive.

**ATTENDANCE**

Your success in this course is dependent in part on your regular attendance. If you are unable to make it to class on time please enter the class sit quietly. Students must sign the attendance sheet within the first 10 minutes of class, or they will be considered absent. The student will be dropped automatically if she/he misses the first day of class, without contacting the instructor. If a student misses more than 25% of the lectures/labs, without contacting the instructor with a valid excuse, they will also be dropped. If you miss a lecture you need to read and summarize the chapter in the textbook **before** meeting with the instructor to discuss any problems. The homework will be on the internet notes so that you can do the homework even if you missed the lecture. There will be no make-up exams. The final exam grade will be counted for the grade for the missing exam. If you miss a lab you still need to do the prelab and postlab assignments and turn them in at the beginning of the ext lab period.

**BLACKBOARD**

Blackboard is used extensively in this course. Students are required to have a college e-mail address, but you may set it to forward to your personal e-mail address. Students are responsible for monitoring their Blackboard account for announcements, schedule changes, and other communication with the instructor.

**IMPORTANT DATES
DROP DATE FOR A REFUND:** Monday, June 17 (first day of class)

**INDEPENDANCE DAY:** Thursday, July 4 (no classes)

**DROP DATE FOR A "W":** Sunday, July 7 (using Webadvisor). After this date a grade will be given.

**CHEM 3A Summer 2013**

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|  | **Date** | **Lab** | **Lecture Topic and Chapters in Tro** |
| Mon | June 17 | Lab Safety, Safety Quiz. Check in lockersPeriodic Table | Syllabus2.2 Scientific Notation2.3 Significant Figures |
| Tues | June 18 | Exp 3. Densities of Liquids and Solids | 2.6 Dimensional Analysis & Measurements3. Matter, Physical and Chemical Changes |
| Wed | June 19 | Exp 1. Properties and Changes of Matter  | 4. Atoms, Elements and Ions5. Chemical Nomenclature:Ionic Compounds |
| **Thur** | **June 20** | **Lecture:** 5.7 Chemical Nomenclature: Molecules,Polyatomic ions and Hydrates |  **Exam 1** |
| Mon | June 24 | **Nomenclature Handout**  | 5.11 and 6.1-6.1 The Mole6.7 Percent Composition 6.8 Empirical Formulas |
| Tues | June 25 | Exp 4: Relative Masses of Zn and Cu | 6. Thermochemistry 6. Calorimetry |
| Wed | June 26 | Exp 5. Simplest Formula of a Compound |  7.7 Net Ionic Equations, electrolytes8. Stoichiometry |
| **Thur** | **June 27** | **Lecture:** 7.1-7.4 Balancing Chemical Reactions 7.9-7.10 Types of Reactions | **Exam 2** |
| Mon | July 1 | Exp 2: Calorimetry | 8.6 Limiting Reactants8.7 Percent Yield |
| Tues | July 2 | Exp 13: Percent water in hydrates | 9 Electrons in Atoms and the Periodic Table |
| **Wed** | **July 3** | Exp 7: Percent copper recovery | **Exam 3** |
| **Thur** | **July 4** | **No Classes** |  |
| Mon | July 8 | Exp 8: Alum production from scrap aluminum | CH 10 Chemical Bonding |
| Tues | July 9 | Lewis Diagrams and Molecular Models | CH 11 Gases |
| Wed | July 10 | Exp 9: Production of hydrogen gas  | CH 12 Liquids, Solids, and Intermolecular Forces |
| **Thur** | **July 11** | Calorimetry: Heat of Fusion | **Exam 4** |
| Mon | July 15 | Exp 14: Molar mass of a volatile gas | CH 13 Solutions |
| Tues | July 16 | SG: Molarity and Concentration | CH 14 Acids and Bases |
| Wed | July 17 | Exp 11: Acid base titration | CH 15 Chemical Equilibrium |
| **Thurs** | **July 18** | Exp 10: pH | **Exam 5** |
| Mon | July 22 | Exp 12: Lab Practical Acid-Base Titration (Group 1) | CH 16 Oxidation and Reduction |
| Tues | July 23 | Exp 12: Lab Practical Acid-Base Titration (Group 2) | CH 17 Radioactivity and Nuclear Chemistry |
| **Wed** | **July 24** | SG: Calculations Review | **Exam 6** |
| **Thurs** | **July 25** |  | **Final Exam** |

**ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**

If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the American with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

**SPECIAL NOTES**

1. The schedule is tentative and may be changed if deemed necessary by the instructor. Assignments and specific assignment instructions and dates are subject to change if deemed necessary by the instructor. Notice of any changes will be given either verbal or written notice either individually or as a group. This may include a notice given on Blackboard. It is the responsibility of each student to be present in class when the announcement is made and to check Blackboard frequently. An absence from class does not constitute an excuse for not knowing what has transpired in class.

2. Students are expected to be in class during all scheduled meeting times. Student athletes and class field trip participants need to notify your instructor about their schedule well in advance.

3. If a student chooses to withdraw from the course, it is the responsibility of each student to complete the proper procedure for withdrawal. Do not depend on your instructor to drop you from the course.

4. Class participation counts as part of the overall class grade. It is the responsibility of each student to sign the attendance sheet at the start of each class meeting. Students who do not sign the attendance sheet will be counted as absent. Any student that leaves class before the end of the class session will be counted as absent.

5. Late work is only accepted at the beginning of the next class and 10% will be deducted. Any work (homework, lab work, or study guides) received later than this will receive a score of zero.

6. All written assignments must contain the proper grammar, punctuation, and mechanics.

7. No student work will be accepted written in red ink.

8. All students will confer with the instructor if there are any problems or concerns. The instructor will be available to conference with students after each class and during office hours.

9. All cellular phones, beepers, pagers, MP3 players, and IPods must be turned off while in class session and lab time. Earphones are not allowed in students ears. You may not text during class. The use of these devices will result in the student being counted absent.

10. The instructor may not be recorded during lecture time without the consent of the instructor.

11. Sunglasses must be removed during class sessions. Hats must be removed during exams.

12. Conversations between students are not permitted while the instructor is lecturing. On repeated incidences, the student(s) will be asked to leave and he/she will be counted as absent.

13. “Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly attained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest ef­fort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences.” (FCC Course Catalogue)

14. All assignments must include the students first and last name and section number. Assignments that have multiple pages must be stapled together.

15. Students will maintain a respectful tone towards the instructor and other students. Students who are disrespectful and/or belligerent and/or disruptive will be removed from the class for a minimum of two class sessions and counted absent for both, as well as the session in which the student was asked to leave early.

17. The instructor has the right to assign seating.

18. Students are encouraged to ask questions. You should be prepared to have the question answered with another question.

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| **Student Learning Outcomes:** |
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| Upon completion of this course, students will be able to:  |
| 1. Use dimensional analysis to solve for an unknown parameter of density, volume, mass, pressure, temperature, molar mass, concentration, or an empirical formula.
2. Construct and balance a chemical reaction and use the reaction to predict stoichiometric quantities.
3. Explain concepts from the periodic table and the use the periodic table to solve chemical problems.
4. Describe acid-base reactions and how to calculate pH.
5. Name and draw Lewis diagrams of inorganic and molecular compounds from the formula and vice versa.
6. Safely conduct laboratory experiments implementing concepts and principles learned in lecture.
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**Course Objectives**:

Upon completion of this course, students will be able to:

1. demonstrate an appreciation for the impact of chemistry on modern society and the relationship between chemistry and other disciplines including agriculture, the medical field, and industry;
2. classify types of matter, recognize physical properties and chemical properties, and a general understanding of the Law of Conservation of Mass and the Law of Conservation of Energy;
3. perform unit conversions using the correct significant figures; between the English and metric systems, temperatures in different units, density, energy, and with SI units;
4. use the periodic table to predict physical and chemical properties of elements and calculate molar masses of compounds and molecules;
5. recognize the electromagnetic spectrum and have a basic understanding of the quantum mechanical model of the atom;
6. demonstrate the ability to name inorganic compounds given their formulas, and write formulas given names;
7. distinguish and identify metals, non-metals, metalloids, and the elements of alkali metals, alkaline earth metals, halogens, noble gases, transition metals, and elements of the lanthanide and actinide;
8. distinguish and identify between different types of intramolecular and intermolecular forces of attraction present in various substances based on chemical formulas and structures;
9. write Lewis Electron-Dot Formulas and identify the shape using VSEPR method;
10. write and balance chemical equations, and use these equations along with stoichiometry and the mole concept to convert quantities (e.g. grams or moles) of a given substance into quantities of an unknown substance;
11. calculate, empirical formulas, and percentage composition given the appropriate data;
12. distinguish and balance chemical equations of different types of reactions;
13. perform calculations involving a limiting reagent and determining the percent yield;
14. predict the physical behavior of gases to pressure, temperature, and volume changes;
15. solve simple mathematical problems involving formula calculations related to gas laws;
16. use gas laws and stoichiometry to calculate quantities (e.g. moles, volume, grams) of gas produced or consumed during a reaction;
17. calculate various parameters of solutions including molarity, dilution techniques, percentage concentration, and density.
18. construct heating and cooling curves;
19. describe state and energy changes accompanying heating and cooling curves;
20. apply the principles of equilibrium in reversible reactions, saturated solutions, solutions of weak electrolytes and solutions of gases in solving related problems;
21. use solution properties and stoichiometry to calculate quantities (e.g. moles, volume, grams) produced or consumed during a reaction;
22. describe colligative properties of solutions (e.g. boiling point elevation, freezing point depression, and osmotic pressure);
23. define and identify acids and bases and be able to perform math calculations involving the pH;
24. determine the nature and applications for electron exchange reactions;
25. understand the structure of the atomic nucleus;
26. understand the fundamental types of nuclear radiation and the effects they have on biological systems
27. and demonstrate laboratory skills which include operating an analytical balance; calibrating and/or use fundamental lab equipment such as a thermometer, barometer, buret, pipette; recognizing use and limitations of laboratory glassware; recording and reporting observations; using error analysis techniques to evaluate certainty of data; use safety precautions and general laboratory procedures.

**LAB SAFETY CHEM 3A**

**Safety is everyone’s business.**

Conduct yourself in a responsible and mature manner at all times in the laboratory.

Preparation is key to safety: come prepared to lab.

**ATTIRE**

* You are required to **wear safety glasses** at all times in the lab when experiments are conducted. You only have one pair of eyes, and people have lost their eyesight partially or even totally due to accidents with chemicals.
* You are required to **wear a lab coat** at all times in the lab when experiments are conducted. This is a safety code, NOT a dress code; you need to protect your body from any possible chemical spills.

 - Your body needs to be entirely covered: shorts, and skirts (which expose thighs) are not allowed at all times in the lab.

* Your feet need to be entirely covered: flip-flops, any open toed shoes or uncovered heels are not allowed in the lab.
* Hair longer than shoulder length needs to be appropriately tied back.
* You should not wear dangling jewelry or any loose, baggy garments, scarves, as to avoid undesired unplanned contact with any chemicals.
* Use of ipods and the like are not allowed during lab. Loud music is distracting. Earphones prevent you from being aware of your environment.

**CONDUCT**

* There is absolutely no eating, drinking, chewing or applying make up in lab. Even water! Chemicals can be accidentally ingested or absorbed through your skin. Do not use glassware as containers for foods or beverage. You are allowed to quickly step outside for drinking. However make sure you do not leave any experimental work unattended.
* Avoid contaminating yourself. Wash your hands before handling food, gum, cigarettes make up, etc. Do not touch your face and eyes before washing your hands.
* Note the locations of the fire extinguishers, fire blankets, fire alarms, safety showers, eyewash fountains and first aid kits.
* Keep aisles and corridor clear. Access to exits and emergency equipment must be unobstructed.
* Unauthorized experiments are prohibited. Perform only the assigned experiments, during regular hours and with adequate equipment and supervision.
* Clean your bench (with detergent), rinse and wipe dry your bench at the end of the experiment. Students will be assigned days to clean any common areas: fume hoods, balances’ area, sinks’ area, etc. Return all chemicals, and apparatus and equipment in clean and working order to their proper locations. If something is not working, please inform the instructor so that it can be repaired. Points will be deducted for not cleaning your area or not cleaning and putting away your glassware/labware.
* Chemical wastes need to be discarded properly, in labeled waste containers kept in the fume hoods. Never dispose of chemicals in the sinks.
* Do not throw anything (chemicals, towel paper, matches, etc) in the sinks.
* Never walk away from a reaction. Watch it carefully at all times no matter how slowly it seems to be proceeding.

**HANDLING GLASSWARE**

* Dispose of broken glassware in appropriate broken glass waste container, not in a regular trashcan. Use a brush and dustpan to clean up broken glassware. Never use your bare hand.
* Examine glassware before each use. Never use chipped, cracked or dirty glassware.
* Use great care in inserting glass tubing / thermometers into rubber stoppers. Use glycerin when inserting glass tubing or thermometers into stoppers. Do not hold the stopper in the palm of your hand, but between your thumb and forefinger. Rotate the tube while pushing it gently into the hole, with an even pressure.
* If you do not understand how to use a piece of glassware / equipment, ask the instructor for help.

**HEATING SUBSTANCES**

* Never leave a lit heat source unattended. Turn off burners or hot plates when not in use.
* Do not use a burner around a flammable liquid, but rather a hot plate. Handle flammable compounds in a fume hood. When using a fume hood, the hood door needs to be aligned with the red sash lines on said hood.
* Beware: hot glassware looks like cold glassware! Remove hot glassware with tongs or a hot pad. Do not use a cold pad and do not set a heated piece of glassware on a cold surface as the hot glassware may crack.
* When heating a substance in a test tube, be careful not to point the open part of the test tube towards anyone. The contents of the test tube might be ejected suddenly, like a geyser, causing burns or worse. Preferably heat the sides not the bottom of the test tube.

**HANDLING CHEMICALS**

* All chemicals in the laboratory are to be considered dangerous.
* Do not taste anything in the laboratory, chemicals or not. Non-chemicals might be contaminated with hazardous materials.
* Do not smell any chemicals directly. Generally avoid smelling things from concentrated sources in the laboratory. If directed to do so, smell things with care: hold the container at arm lengths, fan the vapors toward your nostrils by sweeping your hand over the top of the container.
* Do not pipette by mouth: use a pipette bulb instead, to avoid possible chemical ingestion.
* Avoid wasting chemicals. Obtain only quantities of chemicals and solutions needed for the experiment. You will need to properly discard of any excess reagents.
* Never return excess material to their original containers. Unused samples in vials should be returned at the end of lab period as is. Do not contaminate any stock containers.
* If a stopper or solid reagent seems stuck in a bottle, see the instructor for help.
* Handle bottles by their labels, so that any drips will be on the side away from the label and also not be on the next person's hand. Clean any reagent spills immediately to protect everyone.
* Acids must be handled with extreme care. When diluting acids always add acid to water slowly with periodic swirling. If you add too much acid during too little time, intense heat will be produced which can cause an explosion.
* Never remove chemicals or other materials from the laboratory area.

**CHEMICAL SPILLS AND CONTAMINATION**

* Any spills need to be cleaned immediately! Dry solid materials (unless posing a specific hazard) can be swept into a dustpan, which will be passed on to the instructor or to the lab technician.
* Spilled acids and bases need to be neutralized, respectively, with sodium bicarbonate or citric acid, and then discarded down the drain by flushing with excess water.
* If you get any chemical in your eyes or on your skin, immediately flush the area with water in the eyewash station or in the sink / safety shower for at least 15 minutes. Then seek medical attention.
* For any burns, cuts, exposure to corrosive chemicals, inhalation of fumes go to the nurse for treatment. You need to know which chemicals were used to help medical staff to give you an appropriate medical treatment.
* Report any accident or injury to the instructor immediately.

**SPECIAL NOTES**

* Students having a medical condition such as, but not limited to hypo- or hyperglycemia, diabetes, epilepsy, heart ailments, or any other medical condition that may cause sudden loss of consciousness, should consult their physician and if any accommodations are needed then they should provide the instructor with written directions from their physician.
* The effects of chemical agents used in this course on human pregnancy are unknown. Pregnant women should consult their physician and if any accommodations are needed then they should provide the instructor with written directions from their physician.

I,\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, have read and agreed to follow all of the safety rules set forth in this contract. I realize that I must obey these rules to insure my own safety as well as the safety of others. I am aware that any violation of this safety contract or misbehavior on my part may result in being my removed from the laboratory, receiving a failing grade, and / or dismissal from the course.