**CHEM 3A: Introductory General Chemistry**

**Spring 2011**

**Lecture: MW 1:00 – 2:15**

**Lab: M or W 2:30 – 5:20**

**Instructor:**      Bill Blanken

**Contact info:**   e-mail bill.blanken@reedleycollege.edu using “Chem3A” in subject line, this helps keep the spam filter from rejecting the email if it comes from Yahoo etc., office phone is ext. 3341.

**Webpage:**       [**http://blackboard.reedleycollege.edu**](http://blackboard2.fresnocitycollege.edu/)

**Office Hours:**  Mon and Wed 12:00 – 1:00 PM, Thurs from 1:00 – 2:00 PM

**Important dates:**

MLK Holiday observed: no class, Monday January 17.

Lincoln holiday observed: no class, Friday February 18.

Washington’s holiday: no class, Monday February 21.

Spring Break: no class Monday through Friday, April 18 – April 22.

See the course schedule for additional dates and times.

**Course Objectives**: Chemistry 3A is an elementary survey course in chemistry including lab work. It is designed to give the student a chemistry background for a wide variety of careers including forestry, nutrition, nursing, physical therapy, teaching and other biological and health related fields. It can also serve as a prep course for chem. 1A.

**Recommended course prerequisites: Math 103 is a required prerequisite,** **CHEM 10 or high school chemistry** and **eligibility for ENGL 125**. Many students attempt to take CHEM3A without any prior chemistry. It is possible, but it takes a lot of **hard work**. Start seeing a tutor right from the beginning if you’re having problems. Students will need to be familiar with college level algebra before taking this course as there is a lot of math and critical thinking involved.  I also cannot stress enough the importance of working outside of class in study groups. This can be very helpful to some students. At the minimum exchange email addresses and phone numbers with other class members to help keep up with what’s going on in class throughout the semester.

**Text and Materials:**

1.      Nivaldo J. Tro: “Introductory Chemistry” 3rd Ed., can be purchased online or at the bookstore.

2.      Lab Manual: Introductory Chemistry Experiments, Custom edition for Reedley College by Cengage Learning, available only from the bookstore.

Safety glasses and lab coats are required for lab, these can be purchased at the bookstore or from other students. You will also need materials to take notes and a calculator with “exp” (or “EE”) and “log” keys ($10 or less at Walmart).

**Lecture Notes:** The ability to listen carefully and to take good lecture notes is an essential college skill. Students should print out the fill-in notes and homework assignments off my Blackboard website prior to coming to class. You should also be prepared to take notes longhand should the lecture make that a necessity. **You should also expect to take your calculator to class every class period.**

**Laboratory Work**: Lab work will follow as closely as possible the material discussed in the lectures. The student is required to complete all the assigned experiments. 50% of the final lab grade will include the average of the graded lab report sheets, the efforts to reach the goal of the experiments, the accuracy of measurements and calculations and the lab technique shown during the experiments.  The other 50% of your lab grade is determined by the average of the 3 lab quizzes and a lab practical, which is a demonstration of laboratory skill. Please refer to the lab schedule. If you know you need to miss a lab, attend the other lab section the same week. **No make up labs or make up lab quizzes will be allowed after the week they were assigned as the chemicals and equipment will no longer be available.**

**Homework, Quizzes and Group work:** Homework will likely be assigned for every chapter. It is essential to your success in this chemistry course that you do all the assigned homework and read the relevant chapters in your textbook. All homework will be collected at the beginning of the lecture on the day they are due. There will be no make-up homework assignments, but I will drop the lowest two homework assignments. **Do not copy your homework from somebody else. You only learn by doing the homework problems for yourself**. You can ask other students or get a tutor to help you if you have problems. If two students hand in identical homework, I will deduct points from both students! Make an attempt at every problem**. You must show your work for full credit, answers with no work or explanation showing how you arrived at the answer will not be counted, even if they are correct.** Neatness is also very important, if your homework is sloppy or illegible it won’t be graded. There will be several quizzes over the course of the semester and these will often be “pop” quizzes and there will be no make up quizzes.

**Attendance:** Attendance in lecture and lab is mandatory. Students will be dropped automatically if she/he misses 2 weeks without contacting the instructor. Always inform the instructor ahead of time if you know you have to miss an exam. 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. If you know that you will miss a class you can give your homework assignment to a study partner to turn in.

**Grading and Exams:**  There will be **4 exams** over the course of the semester. There will also be a **comprehensive final** at the end of the semester covering the same material as covered for the exams. The 4 exams will be equally weighted and the lowest score will be dropped. **There are no makeup exams.** If for whatever the reason you cannot take the exam the day the rest of the class takes the exam this exam will be the one that is dropped. The only exception to this rule is a valid medical excuse with documentation to verify the medical emergency. There will be 3 lab quizzes for material covered in the lab. Participation will be graded on attendance and tardiness in class attendance.

The final grade is calculated as follows:

|  |  |
| --- | --- |
| Laboratory (25%): | **Lab Quizzes 12.5%** |
|  | **Lab reports 12.5%** |
| Lecture Material (75%): | **Exams 40%**  **Final 20%** |
|  | **Homework Assignments 7.5 %**  **Quizzes 7.5%** |

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

**Please be aware of the following rules:**

* Tardiness, leaving early, and sleeping during lecture or lab sessions are considered disruptive behavior and will result in a partial or full absence being recorded. Students will need to sign the sign-in sheet within the first 5 minutes of class.
* Texting in class is discouraged and if it is disruptive to the people around you, you will be asked to leave and be given and absence for the day.
* Loud disruptive talking or visiting during the lecture is not advised and if it occurs the students involved will be asked to leave and will be given an absence for the day.
* Fraudulent behavior during exams is graded with a (0) zero and reported to the Dean and other appropriate administration officials.
* Copying of homework, experimental data, and lab reports is considered fraudulent behavior for both the copier and the originator.
* Turn in lab reports before the end of the lab period.
* Late lab reports will not be accepted.
* No homework may be handed in after the due date.  No alternative homework will be given. I will drop the lowest two homework assignments.
* **No extra credit will be given except on the exams.**
* Dangerous behavior in the lab will result in the student being asked to leave the lab. Come prepared to lab, this includes lab coats and safety eyewear.
* Please silence your cell phones during lectures so as not to disturb the class. No cell phones or i-pods will be allowed during exams.
* **In the lab**:
  + Cleanliness in the lab is very important in preventing accidental contamination. At the end of each lab thoroughly clean work area by disposing of loose paper and wiping countertops. Points will be deducted from experiment if work area is left messy.
  + Safety glasses need to be worn whenever somebody near you is conducting an experiment.
  + No experiments may be conducted without the instructor or teaching assistant present
  + No horseplay or unauthorized experiments. Do not taste any chemical or smell any chemical directly.
  + No visitors inside the lab. You need to go outside to meet with them.
  + No food or drinks allowed.
  + Backpacks should not be left on the floor where others can trip over them.
  + Shoes must be worn in the lab at all times.
  + Long hair should be tied back so it will not fall into chemicals or flames.
  + If any accident occurs in the lab, inform your instructor immediately and follow safety procedures. (To be discussed during first lab period)
  + Clean up any spills promptly (Clean-up procedures will be discussed during first lab period)
  + Do not point the open end of a test tube towards anybody
  + Turn off flames when working with organic solvents. Dispose of them in waste bottles in the fume hood, not down the sink.
  + At the beginning of each lab your instructor will inform you of any special safety precautions and how to dispose of used chemicals. You need to be on time for the lab so that you hear these instructions.
  + Do not dispose of matches, paper or solid chemicals in the sink. Use the large evaporating dishes for spent matches.
  + Put broken glassware in the “broken glassware bucket”, not with the trash.
  + Before leaving the lab, wipe the desktop and wash your hands with soap and water.

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 Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

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.

**CHEM 3A Spring 2011**

Lecture and lab schedule are subject to change

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Week |  | **Week** | **Mon or Wed Lab** | **M and W lectures where applicable** |
| 1 | M | Jan 10 | Exp 1: Safety, Safety Quiz. Check in lockers | 1. Intro  2. Measurement |
| **2** | **M** | **Jan 17** | **MLK holiday, no school** |  |
| 2 | W | Jan 19 | Wed lab will still meet & do Exp 6 Density of liquids and solids | 3. Matter, Physical and Chemical Changes,  4. The Atom |
| 3 | M | Jan 24 | Exp - 4 Chromatography  Calculator worksheet | 4. The Atom  5. Molecules, Compounds, Nomenclature |
| **3** | **F** | Jan 28 | **Last Day to drop class to avoid a “W”** | |
| 4 | M | Jan 31 | Exp 2  Nomenclature and polyatomic ion worksheet | 5. Molecules, Compounds, Nomenclature  6. Empirical formula |
| 5 | M | Feb 7 | Mole handout | **Lecture exam 1 on Mon Feb 9, chap 1 – 5**  6. The Mole |
| 6 | M | Feb 14 | Exp 7 Simplest Formula | 7 Reactions  7 Balancing Equations |
| **7** | **M** | **Feb 21** | **Washington’s Day - No class** |  |
| 7 | W | Feb 23 | **Lab Quiz 1**, Exp 8-hydrates | 7 Net Ionic Equations  8 Thermochemistry and Calorimetry |
| 8 | M | Feb 28 | Exp 17 - calorimetry lab | 9 Electronic configuration  9 The Periodic Table |
| 9 | M | Mar 7 | Exp 9 – percentage of oxygen in potassium chloride | 10 Bonding, Molecular Geometry  **Lecture exam 2 Wed Mar 9 chap 6 - 9** |
| 10 | M | Mar 14 | Exp 18 - Molecular Models Lab | 10 Polarity  11 Gases |
| 11 | M | Mar 21 | Exp 11, production of hydrogen gas | 11 Gas Laws  12 Liquids, Solids and Intermolecular Formulas |
| 12 | M | Mar 28 | **Lab Quiz 2**, Exp 12 - Molar Volume of a Gas | 12 Liquids, Solids and Intermolecular Formulas  13 Solutions, Dilutions |
| 13 | M | April 4 | Exp 10 – Types of chemical reactions | 13 Solutions, Dilutions |
| 14 | M | April 11 | Titration of Acids and Bases | **Lecture Exam 3 Mon April 11 chap 10 - 13**  14 Acids and Bases  14 Titrations and pH |
|  | **M** | **April 18 - 22** | **Spring break, NO SCHOOL** | |
| 15 | M | April 25 | Acid/base titration practical – this is for the purpose of demonstrating lab skill | 14 The pH of a Solution |
| 16 | M | May 2 | pH lab and handout | 15 Chemical equilibrium  17 Radioactivity and Nuclear Chemistry |
| 17 | M | May 9 | Check Out of Lockers**Lab Quiz 3,** review for final | **Lecture exam 4 Mon May 10 chap 14, 15, 17**  Review for final |
| 18 | M | May 16 | Finals week, no labs | Monday, May 16 1:00 – 2:50 |