**University of Colorado at Denver**

**(Monarch High School CU Succeed and AP Chemistry)**

**Fall 2013**

**General Chemistry Laboratory I (Chem 2038)**

Beginning: August 23rd

Ending: December 20th

**Class Meets:** W 4th and 6th period

**High School:** Monarch High School

**Instructor:** Kathleen Packard

**Office Hours:** M-F 7-7:30am and by appointment after school hours in B205 (upstairs science office)

**Phone:** 720-561-4329

**Email Address:** [Kathleen.packard@bvsd.org](mailto:Kathleen.packard@bvsd.org)

**Lab Consumables Fee:** $15.00 (due Friday **8/30/2013** pay online at www.payforit.net)

**Prerequisites:** First year high school chemistry

**Optional Textbooks/Readings:**

*Chemistry 2038: General Chemistry I: Laboratory Manual* University of Colorado at Denver. Hayden McNeil, and supplemental materials.

**Course Description:**

**CHEM 2038:** Students perform laboratory experiments on topics covered in CHEM 2031 (chemical structure, atomic and molecular properties, molecular geometry, bonding, thermodynamics, liquids, solids and solution chemistry, and gas laws) and gain experience in observing, recording, and interpreting physical and chemical phenomena. There is emphasis on scientific inquiry in several of the experiments throughout the year

**Course Objectives:** Students will be able to use their theoretical knowledge learned in lecture (CHEM 2031) to perform laboratory experiments on the covered topics.

**Evaluation/Grading Procedures**

**CHEM 2038:**

Final grades will be determined using a standard point system, with no curve. We will be completing at least 9 experiments. Late lab reports will NOT be accepted; unless, of course, it is an excused absence; in that case you have one week to see me about making up any labs or assignments during tutor time on M or W.

**Course Format: CHEM 2038**

Each lab consists of three items that must be turned in. They are: a pre-lab, a copy of the pages from your lab notebook, and a final report with specific, unique details for each that will need to be addressed.

1. ***Pre-Lab*** Pre-labs are to be done BEFORE coming to lab. They consist of the exercises provided in class before the lab. They can be hand written, as long as they are neat. Prelab questions are generally worth about 10-20% of the total value of the lab report.
2. ***Notebook pages*** The Notebook pages are the handwritten photocopies from your lab notebook. This is the record of your work in lab, and it is due at the end of lab class (after all of the data has been collected). There are four things that are to be included in these pages:
   1. **Data**: Your raw data that was collected in the lab - Fully tabulated and well organized. Do not forget units, labels etc. Make your data tables BEFORE coming to lab. Make them HUGE or leave space so that you can extend them to accommodate more data as necessary!
   2. **Observations**: Several observations about the experiment. These can be as simple as color changes, odors, etc. Make note of all that you see, you never know what is important!
3. ***The Lab Report*** The report consists of a title, purpose, a brief procedure (paying close attention to safety precautions that were followed as well as deviations from the procedure as written), a summary of the data collected, a conclusion and answers to the questions in the Report section of the written lab instructions. Your answers should be numbered and in order. Answer the questions as completely and thoughtfully as you can. Yes or no answers without an explanation or discussion will be considered guesses and not graded. Complete sentences with reference to the question are the best. The report is your finished product, and should be treated as such. Presentation is very important; thus reports must be typed, graphs should be computer generated and include labels, units, titles and equations for regressions. All data should be tabulated, labeled and titled. The report is due at the beginning of the following block period.

**Late Work Policy**

This is a college course; as such you are expected to be responsible for your actions and for completing your work on time. Obviously, there may be times you miss class due to illness or other excused absence. For any missed tests, quizzes and experiments, you are expected to complete them within the period of one week from the originally assigned date. I stay late on Mondays and can also leave the tests and quizzes in the Forum for you to complete in an off-period. Experiments will need to be performed in B212 during tutor times on M or W or by making an appointment.

Lab reports or prelab questions will NOT be accepted late for full credit for any reason other than illness or family emergencies. If you attend a school-sponsored field trip, you know well in advance when you will be gone and are expected to turn in your work PRIOR to leaving. If, for some reason, you fail to turn in work when it is assigned, you will lose 50% the minute it is late. However, once I return the graded assignments, you will receive a 0 for that assignment permanently, regardless of how badly it affects your GPA.

**Time Management**

Keep in mind that you have a lot of work due at the beginning of each block period. You have pre-labs, purpose, procedure and data tables to complete. Budget your time appropriately!

**Before School Extra Lab Time**

Since the experiments in this course were designed for a college level course, they tend to be longer than the time allotted in our block schedule. There are some labs that may last over 2 hours. It is very important that you are aware that you may have to start your lab activity before school on certain weeks. Since our block/lab day is Weds, you may want to plan to be early for school on Wednesday mornings. I will be here at 7:30 on those days for zero hour and tutor time; you may want to commit to using that time for extra lab work.

**Schedule of Laboratory Experiments and Description**

1. Measurement Errors (Popcorn Lab)

2. AP Lab – Can the individual components of Quick-Ache Relief be used to resolve consumer complaints? The student will be able to evaluate the classification of a process as a physical change, chemical change or ambiguous change based on both macroscopic observations and the distinction between rearrangement of covalent interactions and non-covalent interactions.

3. Gravimetric Analysis of a Gas-Forming Reaction

4. AP Lab – What makes hard water hard? The student can design and/or interpret data from an experiment that uses gravimetric analysis to determine the concentration of an analyte in a solution.

5. AP Lab – How can we determine the actual percentage of H2O2 in a drugstore bottle of hydrogen peroxide? The student is able to design and/or interpret the results of an experiment involving a redox titration.

6. Determination of the Molar Mass of a Volatile Liquid

7. Hess’ Law Project – Students create a procedure to determine the heat of reaction for

Cu2+ (aq) + H2 (g) 🡪 Cu (s) + 2H+ (aq). They must discuss safety issues and get approval before beginning the experiment. Students are allocated resources (chembucks) with which to purchase needed equipment and chemicals. Students’ grades are based on the best procedure, use of resources and lab report.

8. Molecular Geometry Lab

9. AP Lab – Sticky Question: How do you separate molecules that are attracted to one another? The student can design and/or interpret the results of a separation experiment (filtration, paper chromatography, column chromatography or distillation) in terms of the relative strength of interactions among and between the components.

10. Atomic Spectroscopy Lab is covered in first-year chemistry.

**Safety:**

Safety in the lab is paramount! I will not tolerate unsafe practices of any kind in the lab**. Lab Safety glasses are required for all labs. You may want to get your own pair of safety glasses. Failure to follow the procedures as instructed will result in suspension for the lab which will be detrimental to your grade. Random experimentation will NOT be tolerated.**

**Here are some initial guidelines to safety:**

* A science teacher must be present in the lab when you work.
* Absolutely NO food or drink in the lab at any time, this includes gum.
* Close toed shoes must be worn in the lab at all times. If you come to lab in sandals or open-toed shoes I will make you sit out the lab.
* Safety glasses must be worn at all times in the lab.
* Perform **only** those procedures directed by your teacher.
* Use only the recommend amounts of chemicals.
* Listen carefully for specific precautions needed for each lab set up.
* Inappropriate or childish behavior in the lab will not be tolerated; the result may be that you will be asked to leave the lab and you will receive a zero for that activity.

**SAFETY IN THE LAB IS ESSENTIAL!!**