Chemistry 217

FALL 2016

Welcome to Chemistry 217 for the Fall Semester of 2016. This course will cover many basic principles of chemistry.

Course Title/Number	Principles of Chemistry Laboratory I - CHM 217 Sec 105 & 106
Semester /Year	Fall 2016
Days/Time	T, 1400p - 1650p
Location	S 473 & S 476
Instructor	Price, William
Office	S 490
Phone	696-3156
E-Mail	pricew@marshall.edu
Office Hours	MW 1300 -1350 & 1530-1600, T 1300-1400
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to www.marshall.edu/academic-affairs/policies/. Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment

Course Description: From Catalog

Principles of Chemistry Laboratory I. 2 hrs. A laboratory course that demonstrates the application of concepts introduced in Chemistry 211. (CR or PR: CHM 211 is a co- or pre-requisite)

The table below shows the following relationships: How each student learning outcome will be practiced and assessed in the course.

Course student learning outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
Introduce basic experimental techniques & Practices.	Prepared laboratory experiments.	Exams, quizzes and Teacher evaluation in laboratory and Lab Reports.
Students will learn the basic **PRINCIPALS** of chemistry through practical experience	Prepared laboratory experiments.	Exams, quizzes and Teacher evaluation in laboratory and Lab Reports.
Students will learn the process of using their rational capacities to reach logical conclusions by properly interpreting **FACTS** (data).	Analysis of prepared laboratory experiments.	Exams, quizzes and Teacher evaluation in laboratory and Lab Reports.

Required Texts, Additional Reading, and Other Materials

1. ***Principles of Chemistry I LABORATORY Manual****, 2016-2017.*
2. Safety goggles with indirect vent (Fogless strongly recommended)
3. non-programmable calculator for quizzes, tests, and exams (it must not have keys for the alphabet)
4. A bound laboratory notebook.
5. Combination Lock

Electronic Device Policy

All cell phones and pagers must be either turned off or onto vibrate mode during class. Laptops must be turned off and placed on the floor during the lecture period. During examinations, all electronic devices except calculators must be inaccessible. Students **MUST BRING A CALCULATOR** to class for all lectures and exams. Calculators that are part of a cell phone or smart phones are **not** acceptable for use during an exam or quiz.

Grading Policy

Laboratory Reports/Briefs	25 %
Quizzes	30%
Midterm Exam	15%
Final Exam	15%
Log Book	10%
Instructor Evaluation	5%

Laboratory write-ups are due at the **beginning** (first 5 minutes of the scheduled lab period) of the lab pe following the completion of the experiment. Late lab reports will be penalized 10 percentage points pe day late.

A ≥ 90.00; 90.00 < **B** ≥ 80.00; 80.00 < **C** ≥ 70.00; 70.00 < **D** ≥ 60.00; 60.00 < **F**

Policy

-Attendance is required in this course (Turning in labs not performed will result in a **ZERO** grade for that lab and may result in **FAILING** the course).
-The first half-hour to one hour of each period will be spent in a discussion of the experiment to be done in that period and the chemical principles related to it.
-Quizzes of 10-15 minutes duration will be given every period.
-The bound notebook is for the immediate recording of all experiment operations and observations made during the laboratory period.
- You are expected to be present and prepared for all laboratories. Missed labs cannot be made u Your lowest lab and quiz will be dropped, however.

Safety Instructions:

Your personal health and safety (AND OUR OWN!) are of paramount concern. With normal good judgment and common sense, the chances for accidents in the lab are very small. However, some of the materials used can be dangerous if not handled properly. Therefore, some simple but important safety rules and precautions

* Reading assignments and exam dates are approximate and may be subject to change

are essential. THESE SAFETY RULES MUST BE FOLLOWED AT ALL TIMES BY STUDENTS AND INSTRUCTORS, ALIKE. Violators of these guidelines will be asked to leave the lab.

1. EYE PROTECTION must be worn AT ALL TIMES. The wearing of contact lenses in lab is discouraged. For those who must wear contacts, ventless safety goggles are required and you must notify your instructor and teaching assistants.
2. OPEN-TOED SHOES (e.g. sandals) AND SHORTS or dresses above the knee are not allowed

   In the laboratory.
3. Eating and drinking are NEVER allowed in the lab.
4. No musical devices of any sort may be used in the lab.
5. The most common accidents in the laboratory are cuts caused by broken glass. Clean up after yourself if you break something.
6. All accidents or hazardous situations should be reported to your instructor immediately.
7. NO HORSEPLAY in the lab.
8. Know the LOCATION and PROPER USE of laboratory safety equipment.
9. Be aware of proper waste disposal procedures. These will be discussed at the beginning of each lab period. If you are in doubt about disposal, consult with your instructor.
10. Read and sign the Safety Practices in the Chemistry Laboratory section in your lab manual and the

CHM 218 Lab Report Format

I. Introduction - just one paragraph or so describing the experiment and the goals of the experiment (3 – 5 sentences to be typed).

II. Data - raw experimental data, preferably in tabular form (to be typed).

III. Example Calculations – Show the general equation(s) that you are using and then show the equation with your own data substituted for the variables. Only one example is required for each type of calculation. Foe example, if you calculated percent error for a beaker and a graduated cylinder, only show one trial for the beaker (or cylinder). This section can be hand written.

IV. Results and Discussion – This is arguably the most important section of the report. This is where I want to see graphs and "processed data." I am also looking for some MEANINGFUL analysis of results and an explanation of the why your results are good or bad – whether they make sense. If you spilled some of your sample or had some other source of error that may have affected your results, then

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discuss it in this section. Show that you understand what should have happened and give your best theory as to why or why not it did happen. (5 – 10 sentences to be typed).

V. Questions - Include the question in the answer (i.e. full sentence responses) but number them corresponding to the number in the manual (to be typed).

Make sure all sections are labeled and do not make the results personal (no I's, we's, ours, mine, etc).

The Laboratory Notebook

In all scientific activity, it is important that accurate written records of what is done be kept. The record must be organized in some way, must be complete, concise, and readable. For this purpose, a bound notebook is customarily used. All entries should go immediately into this notebook. They must not be recorded first on odd scraps of paper and then copied into the notebook. This is poor procedure since it runs the risk that significant information will be lost.

Your notebook should be complete enough so that you could go back to it in several years time and be able to re-construct what you did and re-calculate your results. Ideally, someone else familiar with the procedures should be able to do so as well. All raw data should be included: chemicals used, concentrations, weights, volumes of materials added, instruments or volumetric glassware used, etc. Use common sense, however, and do not record trivial information, for example the size of the glove you are wearing. All observations should be recorded. For example:

> *".... B was initially colorless. Upon addition of the pale green A, a blue color was noted. Occasionally, white particles were seen, but these disappeared upon stirring. Upon further addition of A, a white precipitate formed..."*

Be alert for unexpected or incidental phenomena and record these. They can often provide clues as to why an experiment turned out the way it did.

I recommend the following procedures for accurate record keeping in the laboratory. Remember that the better your records, the more complete and impressive your reports will be.

1. Put your name, address, and phone number on the cover of your notebook.
2. Leave space at the front for a table of contents.
3. Number the pages of your notebook.

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5. Enter all pertinent information in detail. Make sure to enter all data and the method by which it was taken. If in doubt about whether or not to record something, record it. If the information is needed at some later time, you will have it.

6. Enter the type of equipment used, and the manufacturer.

7. Record the accuracy of any volumetric glassware (e.g., "50 mL buret graduated in 0.1 mL was used").

8. In recording data, record only the significant figures.

9. Date the pages of your notebook.

10. Cross out discarded data lightly. You may want to read them later. When discarding data, note why you did so.

11. Label all samples. Feel free to devise your own system. For example, I may label a sample WP-145-B, where WP are my initials, 145 is the page number where the entry was made, and B indicates that this sample supersedes WP-145-A.

12. Data collection for similar experiments should be arranged in tabular form, if possible.

Laboratory Schedule*

To make the most of each class period, reading and assignments should be completed before lecture.

Schedule of Experiments:

Date	**Exp. No.**	**Experiment / Assignment**
8/23	1 Part I	Laboratory Check-In. Density of water
		H1 and H2: sig figs and dimensional analysis
8/30	1 Part II & III	Determination of Sugar in Soft Drinks
9/6	2	Separating the Components of a Mixture
9/13	3	Determination of the Percent Oxygen in Air
9/20	4	Determination of an Empirical Formula
9/27	5	Determination of Avogadro's number
10/4	8	Reactions
10/11	7	Synthesis of an Alum & **Midterm Exam**
10/18	13	Determination of Molar Mass (handout)
10/25	6	Heat of reaction and Heat of Solution

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11/1	9	Titration of Vinegar
11/8	10	Combustion!-Synthesis and Reactions of Oxygen
11/15	12	Energy in a Peanut: Calorimetry
11/29	11	Molecular Architecture, Lab Checkout
11/6		**Final Exam**

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