Syllabus CHEMISTRY 217 Sections 113, 114

**Instructor:** Phil Alexander **Phone:** 304-696-4808(Office)

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**Room:** 473, 474, 476 **CLASS TIME:**  2 - 4:50 PM F

**Office hours:** 10-11:00 and 1:30-2 M, W, F; 3:15-4 M, W or by appointment

**Purpose of Course:**

 1. To introduce you to the basic laboratory skills of careful measurements and

 handling of experimental data.

 2. To provide laboratory experience which emphasizes and reinforces the principles and

 concepts of chemistry introduced in your CHM 211 course.

 3. To acquaint you with the quantitative thinking and procedures encountered in

 elementary physical chemistry and analytical chemistry with emphasis on the interplay

 between theory and experiment.

**Materials Needed:**

 1. Laboratory manual available at MU Bookstore.

 2. A bound (sewn, not a spiral bound or taped notebook) laboratory notebook. All

 experimental data must be recorded directly in this notebook during your laboratory

 period. This need not be a specialized “laboratory” notebook, only a sewn composition

 book.

3. Safety glasses. Full-coverage glasses are required. Contact lenses should not be worn

 in the chemistry laboratory. If they are absolutely necessary, a good set of safety

 goggles must be worn at all times while in the laboratory. If you wear contact lenses,

 you must notify your instructor and teaching assistants.

4. A combination lock for your lab drawer.

5. An apron, or other covering for your clothes, is optional, but desirable.

6. The ACS academic lab safety guide is needed. This is available to download at

<http://portal.acs.org/portal/PublicWebSite/about/governance/committees/chemicalsafety/publications/WPCP_012294>

7. A roll of paper towels for cleanup, spills, etc.

8. Access to a textbook to read about the concepts for the experiments to be completed.

9. A scientific calculator. Those with alphanumeric and/or graphing capabilities are **not**

 **permitted** during quizzes or exams.

**Conduct of Course:**

 1. Attendance is required in this course and tardiness will not be tolerated.

 Turning in labs not performed will result in a score of zero for that lab and may result

 in failing the course.

2. The first half 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.

3. Quizzes of 10-15 minutes duration will be given each class. Several will use the NXT

 clicker.

4. The bound notebook is for the immediate recording of all experiment operations and

 observations made during the laboratory period and will be checked throughout the

 term.

5. Lab reports are due at the beginning of the period following completion of the

 experiment.

6. The effects on human gestation of all of the chemicals used in the laboratory have not

 been determined. It may be advisable for pregnant students to avoid prenatal exposure

 by postponing this laboratory to a later date.

7. Prelab questions are to be completed and turned in to the lab assistants for entrance to

 the laboratory.

8. Student must complete the departmental safety training and quiz before the second lab

 class and turn in the completed forms at that class. Safety training can be accessed

 through MUOnline.

9. Plagiarism is a University offense. You must write your own report and not submit the

 same report as a partner.

 10. Makeup lab work must be completed in the current week only. Ask permission.

 11. When you have completed work in the lab, you should return to the pre-lab lecture

 room to work on completing the lab results and answering the post-lab questions. The

 TA’s and instructor will be available to assist you during much of this time.

**Tentative Schedule of Experiments**

**Date Exp. No. Experiment / Assignment**

8/24 1 Part I Laboratory Check-In. Density of water

 H1 and H2: sig figs and dimensional analysis

8/31 1 Part II & III Determination of Sugar in Soft Drinks

9/7 2 Separating the Components of a Mixture

9/14 3 Determination of the Percent Oxygen in Air

9/21 4 Determination of an Empirical Formula

9/28 5 Determination of Avogadro’s Number

10/5 6 Heat of reaction and Heat of Solution

10/12 7 Synthesis of an Alum & **Midterm Exam**

10/19 8 Reactions

10/26 9 Titration of Vinegar

11/2 10 Combustion!-Synthesis and Reactions of Oxygen

11/9 11 Molecular Architecture

11/16 12 Energy in a Peanut: Calorimetry, Lab Checkout

11/30 **Final Exam**

**Important Dates:**

 August 28 First Lab (Come prepared) October 30 Last Day to Drop

 October 15 freshman midterm grades due November 23-27 Fall Break No Class

**Grading:**

The grade in this lab will be based on a wide variety of evaluation tools including exams, quizzes, laboratory experiment results and reports, homework assignments, notebooks, and evaluation by the instructor and /or teaching assistants. The weight for each component is as follows:

 Quizzes (8 or more, drop the lowest score) 20%

 Midterm exam (approx. 1 hour in length) 20%

 Final exam (approx. 1 hour in length) 20%

Post-lab report and experimental results

 (Drop the lowest) 25%

 Instructor evaluation 5%

 Notebook 5%

 Pre-lab Questions 5%

The letter grades will then be assigned based on the average computed using the above weights. You may estimate your letter grade using the following scale:

90 or above A

 80 or above B

 70 or above C

60 or above D

59 or below F

During quizzes or exams, talking and sharing of calculators is not allowed. Students will set in alternate rows while taking the quizzes. There are no make-up quizzes. Missed labs or quizzes count as your dropped grades.

**Safety Precautions:**

 1. Anyone who has not signed the statement acknowledging one’s full understanding of

 the required safety measures will not be permitted to work in the laboratory.

 2. Use care in following the directions of your instructor and laboratory text. Do not

 carry out any unauthorized experiments.

 3. Know the location of all safety equipment in the laboratory. You will be quizzed on

 this.

 4. All injuries, no matter how trivial, must be reported to the instructor immediately.

5. Safety goggles **must** be worn at all times in the laboratory. Since the department does

 not have the proper facilities to sterilize safety goggles between uses, we are prohibited

 from loaning safety goggles to students. It is your responsibility to have your goggles

 in the laboratory. If you do not have your goggles, you will not be permitted to perform

 the experiment. We strongly urge you not to wear contact lenses. If contract lenses

 must be worn, a Contact Lens Waver Form must be signed and given to the instructor.

6. The effects on human gestation of all of the chemicals used in the laboratory have not

 been determined. It may be advisable for pregnant students to avoid prenatal exposure

 by postponing this laboratory to a later date.

**Safety Goggles:** Safety goggles **must** be worn at all times in the laboratory. Since the department does not have the proper facilities to sterilize safety goggles between uses, we are prohibited from loaning safety goggles to students. It is your responsibility to have your goggles in the laboratory. If you do not have your goggles, you will not be permitted to perform the experiment. We strongly urge you not to wear contact lenses.

**Note well:** Observance of the safety rules (especially safety goggles) will be an important factor in determining the Instructor Evaluation portion of the laboratory grade. Any student violating safety rules may be dismissed from the lab.

All university policies, which can be found at this link <http://www.marshall.edu/wpmu/academic-affairs/?page_id=802>, will be observed.

**Lab Report Format**

Except where noted the lab report should be typed. Spelling and grammar should be checked. Parts must be in order.

**1) Name and number of the experiment-also** in the upper right corner, your name, the date, and your lab partners

**2) Introduction-** one paragraph or so describing the experiment.

**3) Data-** this should be the actual experimental data you obtained. Presenting it in tabular form is generally best. Observations are data.

**4) Calculations-** one sample calculation should be provided for each calculation type you do. This can be hand-written, but must be neat.

**5) Results and Discussion-** processed data (i.e. the results of your calculations), graphs, and explanations of your laboratory results should be provided here. Think about what your results mean as you write-up this section. What has this experiment shown you? If you discuss errors, don’t just ascribe them to a generic “experimenter error” or calculation mistake. If something goes wrong, try to track down exactly what it was. If data is hard to determine or limited in some way, tell about that.

**6) Post-Lab Questions-** Answer these questions as full sentences, unless they are calculations (in which case they may be hand written and show your work).