Syllabus **Chemistry 217, sections 203&204** **Spring 2010**

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Office Hours: Monday & Thursday 2-5pm; or by appointment **Credit**: 2 hours
Webpage: http://www.science.marshall.edu/burcl/teaching/chm217_main.html
TAs:
Fridays 1:00 - 3:50 pm Lecture: S-465 Labs: S-474 and S-476

Course Description (from UG catalog)

A laboratory course that demonstrates the application of concepts introduced in Chemistry 211.

Pre-requisites and Co-requisites

CHM 211 is pre- or co-requisite for this lab. I would like to point out that since MTH ACT of 21 (or better or C or better in MTH 127 or equivalent) are pre-requisite for CHM 211, they are implicitly also pre-requisites for CHM 217. If you are struggling with algebra, you will most likely find CHM 217 frustrating and difficult: ideally, you should be comfortable enough with algebra that you can do it while concentrating on chemistry (sort of like turning windshield wipers on and off while concentrating on the road ahead).

Purpose of the Course

CHM 217 is designed to allow you to apply in the laboratory the principles and concepts of Chemistry introduced in your CHM 211 course. It will introduce you to elementary Physical, Analytical Organic Chemistry with an emphasis on the interplay between theory and experiment in science. At the completion of the term, you should be able to:

- write lab reports describing clearly and concisely the experiment and discussing the results
- illustrate the results and general trends by use of clear and informative graphs
- write chemical formulas of inorganic and some simple organic compounds and understand their origin and meaning
- write products of simple chemical reactions and balance resulting chemical equations
- determine the limiting reactant, theoretical yield, and percent yield
- determine molarity of solutions and use this to determine the quantity of a compound in sample by titration
- determine oxidation numbers of atoms in compounds
- determine the reaction enthalpy from enthalpies of formation, enthalpies of combustion, or bond enthalpies theoretically and experimentally
- separate mixtures using the physical and chemical properties of their components
- have firm understanding of underlying chemical and physical principles and calculations associated with the above mentioned processes

While the lab provides an opportunity for learning and practicing correct techniques and procedures, the emphasis will lie in the intellectual component. While it is possible (with sufficient practice) to master the correct techniques without any chemistry knowledge, only understanding of the principles would enable you to design and improve experimental procedures that would answer chemically relevant questions.

Safety Precautions

1. The effects on human gestation of all of the chemicals used in the laboratory have not been determined. It is advisable for pregnant students to avoid unnecessary prenatal exposure by postponing this laboratory to a later date. If you become pregnant during the course of the semester, please seek the instructor ASAP for additional information.
2. 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. Sign only one copy (handout) and turn it in. The second (in your workbook) is for you to keep.
3. Every student has to pass the online safety quiz before the beginning of the second lab period (January 22, 2010), even if you passed it in Fall! You will receive instructions on how to access it via e-mail by the first lab period. Do not delay this!
4. Use care in following the directions of your instructor and laboratory text. Do not alter the experimental procedures without being instructed to do so by either myself or the teaching assistants. Do not carry out any unauthorized experiments.
5. **Protective eye goggles must be worn in the laboratory at all times.** Failure to do so will constitute sufficient grounds for dismissal from the laboratory. You are responsible for obtaining a pair of safety goggles (available in bookstore or S-477).

   Contact lenses should not be worn in the chemistry laboratory. If they are absolutely necessary, you must notify your instructor and the teaching assistants in writing. Furthermore, you must remind them weekly that you are wearing contact lenses.
6. Clothing: Slacks or dresses cut below the knee must be worn. Bare shoulders or midriffs are not acceptable. Shoes covering the bridge of the foot and toes must be worn. **You will not be allowed to work while violating either of these rules.** It is best to avoid very loose clothing and tie back long hair. Because some of the chemicals you will work with are corrosive, we recommend that you use an apron or labcoat and gloves and remove any rings while in the lab.
7. Know the locations of all safety equipment in the laboratory. You will be tested on this.
8. All injuries, no matter how trivial, must be reported to the instructor immediately.

Materials Needed

1. Laboratory workbook (CHM 217), available at MU Bookstore
2. Safety in Academic Chemistry Laboratories (volume 1), available at MU Bookstore
3. A bound (sewn, **not spiral**) laboratory notebook. All experimental data must be recorded directly in this notebook during your laboratory period.
4. Safety goggles. Gloves and an apron or lab coat are optional, but desirable.
5. A (combination) lock. You may want to note the combination on your check-in sheet.
6. A roll of paper towels (comes very handy for various spills etc.)
7. You will need access to the general chemistry course textbook (*Chemistry: The Central Science* by Brown, LeMay, and Bursten). The introductions to the experiments are generally brief. You are expected to have read the pertinent material from the textbook in preparation for the day's quiz and experiment.

Conduct of Course

1. Attendance is required in this course. 2 quizzes of 10-20 minutes duration will be given unannounced at the start of class. Coming to class late means you will have less time to work on your quiz (in addition to incurring wrath of your prof, TAs and colleagues).
2. The first part of each period will be spent in a discussion by the instructor of the experiment to be performed and related chemical principles.
3. The bound notebook is for the **immediate** recording of all experiment operations and observations made during the laboratory period. Laboratory notebooks will be collected at the midterm and final exams for grading of experimental notes. Ask your TA to initial your lab notebook before leaving the lab – otherwise you will not get any credit for the lab report.
4. Lab reports are due the period following completion of the experiment unless explicitly specified otherwise. The reports are due promptly **at 1:00 pm**. Any assignment turned in after that will be considered late and assessed penalty of 10% of grade per day. Even if you cannot attend a lab, you are responsible for submitting the previous-week report on time. If you have problems with printing, I will on emergency basis accept submission via e-mail (same deadline applies) in Word (*.doc), PDF, Open Office (*.odt), or plain text (*.txt) formats. Please, do not e-mail me WordPerfect files, I have no means of reading them. Please, keep all files until the end of term.
5. **Plagiarism** is defined as "the appropriation or imitation of the language, ideas, and thoughts of another author and representation of them as one's original work" (Webster's Encyclopedic Unabridged Dictionary of the English Language; Gramercy Books, New York; 1989). Plagiarism has no place in this course; if detected, it will be severely punished. At instructor's discretion, the punishment would range from an "F" grade for a given assignment or exam (that CANNOT be dropped) to an "F" grade for the entire course. In addition, a letter would be sent to the dean's office explaining the situation. This letter would become a part of student's permanent record. All in all: don't do it – it's not worth it. If in doubt, ask me. Specifically, while you work as a group (thus sharing the raw data) and are welcome to discuss the calculations, meaning of the results, conclusions drawn from the experiment, and post-lab questions (with your lab partner, colleagues, TAs, or instructor), when you sit down to write the report you have to do it by yourself. I repeat, **each of you has to write your own (unique) lab report**!

Grading

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

Online quizzes (3 tries each, best score counts)	15%
In-class quizzes	10%
Midterm exam (approx 1 hour in length)	20%
Final exam (approx 1 hour in length)	20%
Lab reports (drop the lowest score)	25%
Laboratory Notebook	5%
Evaluation by Instructor/TA Evaluation	5%

The letter grades will then be assigned based on the average computed using the above points (weights). The cutoffs will not be higher than 90/80/70/60% for the A/B/C/D grades.

During quizzes or exams, use of cell phones, iPods, PDAs, or computers, talking, and sharing of calculators are not allowed; bring your calculator and pencil for every class! Cell phone, iPod, PDA, or laptop cannot be used instead of calculator.

NOTE WELL: Observance of the safety rules (especially safety goggles) along with general cleanliness of your workstation will be an important factor in determining the Instructor Evaluation portion of the laboratory grade.

Lab/Quiz Makeups: Only "Excused Absences", as defined on page 124 of the MU Undergraduate catalog, can be made up. The proper procedures are detailed on pages 124-125 of the catalog. Please, notify me (by e-mail, phone, or in person) of any absence as soon as possible; do not rely on others to do so (if at all possible).

Online quizzes are available through MU Online (http://www.marshall.edu/muonline) and are due by the beginning of each class. Additionally, two unannounced in-class quizzes will be given (and solutions will be posted after lab). Quizzes cannot be made up. If you miss an in-class quiz due to excused absence, you get the same score as you will have on following midterm/final.

While it is possible to allow students to make up a missed laboratory by coming into another section (during the same week), it cannot be guaranteed; early notification is absolutely essential! Since the necessary chemicals and apparatus are not available except during the scheduled time for the experiment, the labs cannot be made up in the preceding or following weeks. Labs missed due to excused absence should be made up by attending another session if possible (see above). If your absence extends beyond the week of the lab, skip the lab altogether (you will receive an average score of the rest of your labs). If in doubt, ask me!

WARNING: There is absolutely no excuse to leave your drawer at check-out time with too little or too much equipment or with broken and/or unclean equipment. If this happens, I reserve the right to lower your grade by an entire letter grade. If you cannot check out yourself, ask a reliable friend! If you have to drop the lab, you still have to check out; otherwise you will be re-instated and given an F.

Tentative schedule:

Module	Experiment/Assignment	Discuss/Perform Experiment	Postlab/ HW Due
1	Safety Precautions, Check in Determination of Sugar in Soft Drinks, part I	Jan 15	Jan 29
1	Determination of Sugar in Soft Drinks, parts II & III	Jan 22	Jan 29
2	Separating the Components of a Heterogeneous Mixture	Jan 29	Feb 5
3	Determination of the Percent Oxygen in Air	Feb 5	Feb 12
4	Determination of Avogadro's Number	Feb 12	Feb 19
5	Determination of an Empirical Formula	Feb 19	Feb 26
6	Synthesis of an Alum	Feb 26, Mar 5	Mar 12
	Midterm Exam	Mar 5	
7	Analysis of Commercial Antacids	Mar 12	Mar 19
8	Determination of Water Hardness	Mar 19	Apr 2
	Spring Break (no lab)	Mar 26	
9	Combustion! – Synthesis and Reactions of Oxygen	Apr 2	Apr 9
12	Energy in Context: Synthesis of an Ester	Apr 9	Apr 16
13	Energy in a Peanut: Calorimetry	Apr 16	Apr 23
	Final Exam/Checkout	Apr 23	

Policy for Students with Disabilities: Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone 304 696-2271 to provide documentation of their disability. Following this, the DSS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit http://www.marshall.edu/disabled or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271.

MU Equal Opportunity/Affirmative Action Policy is available on page 90 of 2009-2010 undergraduate catalog (http://www.marshall.edu/catalog/undergraduate/ug_09-10.pdf)

MU Computing Services Acceptable use policy is available online at http://www.marshall.edu/ucs/CS/accptuse.asp

MU Inclement Weather Policy is available on pages 92-93 of 2009-2010 undergraduate catalog (http://www.marshall.edu/catalog/undergraduate/ug_09-10.pdf)

MU Withdrawal Policy is available on pages 129, 130, and 139 of 2009-2010 undergraduate catalog (http://www.marshall.edu/catalog/undergraduate/ug_09-10.pdf)

MU Incomplete Policy: The grade of I (incomplete) indicates that the student has completed three-quarters of the course, but cannot complete the course for a reason that accords with the university excused-absence policy. Students must be in good standing in the class prior to requesting an incomplete. The course instructor decides whether or not an incomplete will be granted and specifies in writing what work the student must complete to fulfill the course requirements. The student has until the end of the next fall or spring semester from the date of receipt of the incomplete grade in which to complete the course, or the instructor may establish an earlier deadline. If special circumstances exist, which prevent the student from completing the course in the prescribed time, the incomplete may be extended with approval of the instructor, the instructor's chair or division head, and the instructor's dean. If the student satisfactorily completes the course in the prescribed time he/she will receive a letter grade. If the student fails to complete the course requirements during the stipulated time, the grade of I changes to a grade of F.