BCUSP 162: General Chemistry III Lab – Spring 2010

GENERAL INFORMATION

Section AA: **Tuesday, 12:30 - 3:20pm** (in **CC1-340**)

Section AB: **Friday, 11:30 - 2:20pm** (in **CC1-330**)

Instructor: **Colleen Craig**

Office: UW1-151

Email: **cfcraig@sccd.ctc.edu**

Office Hours: _____

COURSE DESCRIPTION

Meeting for one three-hour period each week, students will perform experiments, collect and analyze data, and complete laboratory reports designed to complement the theory and concepts presented in the General Chemistry III lecture. **Prerequisite:** Completion of BCUSP 152 or equivalent with a grade of 1.7 or higher.

REQUIRED MATERIALS AND EQUIPMENT

- **Experiment Manuals** containing background information and the experimental procedure for each experiment will be available for download on **Blackboard** (http://blackboard.uwb.edu) at least one week in advance of the laboratory session. **Bring this manual to lab!!** Extras will not be provided.
- A **Laboratory Notebook** with numbered, duplicate pages.
- **Laboratory safety goggles** are required on all faces at all times during the lab.
- **Proper laboratory attire** is required at all times during the lab. Since this is a spring quarter course, you may need to plan ahead and bring proper clothing and shoes to change into before lab. **Failure to meet this requirement will result in expulsion from the lab, and you will be awarded zero points for that lab report.** Proper attire includes:
  - Shoes that cover your entire foot…*absolutely no sandals, open-toe shoes, or shoes that show the top of your foot will be allowed.*
  - Long pants…*no skirts or shorts.*
  - Shirts that cover your shoulders, midriff, and back *at all times.*
  - Long hair and bangs that is tied up *at all times.*
- A **Scientific Calculator** with exponential and logarithmic (log and ln) function capabilities.

ATTENDANCE & PUNCTUALITY

The laboratory experiments require up to 3 hours in lab each week, and will often require the entire 3-hour period. Therefore, it is crucial that you arrive on time, and that you are adequately prepared. Each experiment is set up for one week only and must be completed during the lab period. **No make-up labs are allowed!** ***If you miss more than one laboratory experiment you will receive a failing grade in the course.***

The ***safety hazards*** for each experiment will be discussed **at the start of the lab period**, so **you must arrive on time!** ***Students who arrive more than 5 minutes after the start of the lab session will not be allowed to complete the experiment and will be asked to leave.***

EVALUATION

The laboratory portion of BCUSP 162 comprises 20% of your course grade, and you must obtain a passing grade (> 70%) in the lab portion to pass BCUSP 162.

There will be **8 graded labs**, each worth **50 points**. Each lab will consist of some preparatory work, the experiment itself, and a type-written lab report. A **Peer-Grading Exercise** will be required for one experiment. Details on the requirements for this exercise will be discussed later in the quarter.

EACH LAB PARTNER WILL SUBMIT HIS/HER OWN REPORT. Write your own text, and create your own figures and tables. Your report will be compared to your partner's report during grading. Plagiarism will not be tolerated.

NO MAKE-UP LABS WILL BE ALLOWED. If you must miss lab due to unavoidable life circumstances, contact your instructor ***as soon as possible*** to discuss the situation. Be prepared to present proof of your unavoidable life circumstance (i.e., doctor's note, accident report, memorial folder, etc) that includes a phone number for use in verifying the event. If you miss a lab and do not have a valid excuse, you will receive a zero grade for that lab. More than one unexcused absence from lab will earn you a failing grade in BCUSP 162.

BEFORE THE LAB

Download the **Experiment Manual** from Blackboard and read it ***carefully*** and ***thoroughly***. **DO NOT** wait until the day of lab – or even the day before lab – to do this. The experiments you will conduct in this course are *complicated,* and you will not be successful if you wait until the last minute to prepare.

Prepare **Title, Purpose, Procedure, Pre-Lab Lecture Notes**, and **Data Tables** sections in your lab notebook ***in non-erasable INK.*** **These sections must be completed prior to the beginning of the lab session!**

Pre-Lab Quizzes will be available on Blackboard for a period of one week before the lab, with access ending 30 minutes prior to the start of the lab session. **You must pass the pre-lab quiz with a score of 90% or better or you will not be allowed to perform the experiment.** You may take the quiz as many times as you like. A lab missed due to poor performance on the pre-lab quiz will be considered an unexcused absence.

DURING THE LAB

Lab Report Submission. Lab Reports for the previous week's experiment are due at the beginning of the lab session. Lab Reports submitted within 30 minutes of the beginning of the lab session will be accepted for full credit. **Lab Reports submitted *later than 30 minutes* will not be accepted, and will be awarded zero points.**

Pre-lab Lecture. At the beginning of each lab session, your instructor will provide a brief introduction to the experiment, including a discussion of safety hazards, background information, and a demonstration of the experimental apparatus where appropriate. You are encouraged to take notes in your lab notebook. Note that these lectures are intended to ***supplement*** the experiment manuals, not to reiterate them.

Pre-lab Notebook Sections Approval. Your instructor must review and sign-off on the pre-lab sections you completed in your lab notebook. ***It is your responsibility to obtain your instructor's approval of these sections within the first 30 minutes of lab***. If you fail to do so you will receive no credit for that portion of your lab report. Your instructor will not sign off on incomplete or poorly-executed notebook prelabs.

Data Collection Etiquette. Only record data that *you and your partner* collect! All data must be recorded **in your lab notebook in *non-erasable INK***. Any data recorded on loose-leaf paper, experiment manuals, or any location other than your lab notebook will be confiscated. Any data recorded in pencil in your lab notebook will be confiscated...*these pages will be torn out of your notebook*.

Before you leave. At the end of the lab period, obtain your instructor's signature in your notebook and then **hand in the carbon-copy pages** associated with the prelab and data sections of the experiment. ***Note that it is each partner's responsibility to obtain approval of his or her notebook pages.*** If you fail to do so you will receive no credit for that portion of the lab.

AFTER THE LAB

Post-Lab Analysis. The experiment manuals will contain a description of the calculations required to properly analyze the data collected, specific requirements for the lab report (see below), and a list of post-lab questions designed to gauge your conceptual understanding of the experimental results.

Lab Reports must be **typewritten** with **computer-generated figures and tables**. When composing your reports, imagine that you are writing it for a student at another university who has had the same amount of general chemistry as you, but whose instructor assigned different laboratory experiments to illustrate the concepts discussed in lecture. Think about what you would need to tell this student and how you would need to tell them so that they could understand your experiment.

Lab Reports will be comprised of the following sections:

- **Title.** Include a descriptive title of the experiment that indicates the chemical phenomena investigated and the method(s) used to investigate them.
- **Abstract.** This section summarizes four essential aspects of the report: the purpose of the experiment, key findings, a brief reference to theory or methodology, and major conclusions. In a scientific journal article, the information presented in the abstract allows the reader to decide whether they should read the rest of the article. It should be a compelling section that makes the reader want to know more!! The abstract should be one paragraph of 100-200 words.
- **Experimental.** Note any changes you made to the published procedure, i.e., extra runs that were conducted due to poor accuracy, extra solution that had to be made due to contamination or loss, portions of the procedure that were omitted or added according to pre-lab lecture, etc. If no changes were made, simply refer to the Experiment Manual.
- **Results.** Present computer-generated tables and figures of your experimental results. Figures and Tables must be easy to read, well-formatted, and well-labeled with a Table/Figure number and a *descriptive* caption (e.g., Figure 1: Temperature vs. Time Data for the Determination of the Calorimeter Constant). However, **DO NOT** simply vomit out a bunch of tables and figures without giving them any context. Make your results effective by explaining what the reader is looking at with a sentence or two. This is also a good place to point out interesting trends or anomalies you may have noticed during your analysis. Remember, no one knows your results as well as you do…help the reader get to know them!
- **Discussion.** This section gives you an opportunity to show that you understand the experiment beyond the simple level of completing it. Explain. Analyze. Interpret. Your discussion will be fairly subjective, in that you will be describing things that are not readily observable. When writing the Discussion, ask yourself: "What is the significance of the results? What do they indicate about the phenomena I was investigating here? What is still unknown or ambiguous following my experiment and analysis? What questions does this analysis raise? What further experiments might I perform to clarify the results?"
- **APPENDIX 1: Calculations and Analysis.** You are strongly encouraged to use Microsoft Equation Editor or a similar program to present your calculations. If you do not have access to such software you may handwrite your calculations but they must be **NEAT** and **ORGANIZED**. If I can't read it, I can't grade it.
- **APPENDIX 2: Post-lab Questions**

LABORATORY EXPERIMENT SCHEDULE (SP 10). ***This schedule is subject to change.***

Mar 30, Apr 2	Introduction and syllabus
Apr 6, 9	Exp 1: Molecular Structure and Infrared Spectroscopy
Apr 13, 16	Exp 2: Electronic Structure and UV-Vis Spectroscopy
Apr 20, 23	Exp 3, Part 1: Chemical Kinetics – Method of Initial Rates
Apr 27, 30	Exp 3, Part 2: Chemical Kinetics – Integrated Rate Law
May 4, 7	Exp 4: Vapor Pressure of Water
May 11, 14	Exp 5: Solubility and Fractional Crystallization
May 18, 21	Exp 6: Freezing Point Depression
May 25, 28	Exp 7: Salicylic Acid Synthesis
Jun 1, 4	Exp 8: Transition Metals and Coordination Chemistry
Jun 8, 11	NO LAB