

CHEMISTRY 145 Fall 2014: LABORATORY SYLLABUS

Instructors:

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Lab schedule: The first lab sessions will meet in the first full week of classes (Sept. 10-11). Be prepared to begin promptly at the scheduled start of your session in Keyes 409. Please make sure that you bring a copy of this syllabus as well as your bound laboratory notebook. During the first week's session we will also highlight safety issues and procedures.

Lab rules and safety: Sensible clothes must be worn to lab. No open-toed shoes or sandals are allowed. Long hair must be tied back. Backpacks and other personal belongings must be left outside of lab. Food, drinks, and gum are never allowed in the laboratory. Please read the additional safety information at the end of this document. During your first lab meeting you will be assigned a lab drawer to use for the semester and be provided with safety glasses. You are expected to wear safety glasses each week throughout the scheduled lab, including time spent writing in lab books or doing computer work. At the end of each lab you may store your glasses in your assigned lab drawer.

Lab exercises: Lab exercise documents are available on the Chemistry 145 laboratory web page <http://www.colby.edu/chemistry/CH145/lab/CH145Lab.html> at least several days in advance of each lab. These documents will include a detailed description of the week's experiment as well as instructions for what work to complete prior to your lab section. *You are expected to bring a printed copy to lab with you each week.*

Pre-lab assignment: Before each lab, prepare yourself by thoroughly reading the laboratory handout and answering several Pre-Lab questions in your notebook. The Pre-lab questions are posted on the lab Web site and the questions are keyed to the last digit of your student ID. These questions will count for 25% of your lab grade and are either correct or incorrect. You must be prepared for the experiment when you arrive at your lab session, answering these questions will help you to do that.

Lab lecture: Each week there will be a brief lecture on important information related to the lab. Any changes to the procedures will be explained and equipment will be demonstrated. This information supplements what is in the lab handout. As such, punctuality is an inflexible requirement each and every week (see grading consequences below).

Lab notebook: Buy a bound composition book (no carbon copy or spiral notebooks) and bring it to the first lab. The notebook can be a lined or graph paper notebook. On the inside front cover put your name, lab section, and the contact information for your instructor (refer to the syllabus). Number the pages in your notebook before using it (it would be okay to number just the front side of each page as 1, 3, 5 etc.). The first TWO pages of your notebook will be for the Table of Contents, which must be kept up to date. This notebook will be used to record data and observations for every lab exercise.

A CH145 notebook entry should include the following features:

Title: Summarize the chemical concept being explored.

Purpose: State the purpose of the laboratory experiment. State the scientific purpose of the experiment. Describe the method you will use, in a general sense (e.g. “by constant pressure reaction calorimetry”). Do not discuss the experimental procedure details or data analysis steps. Don’t include pedagogical goals (e.g to teach us how to use.....)

Name and date: Your name and the name of your partner(s), and the date.

Procedure / Data / Observations: Describe the steps you follow during the experiment in concise terms. Write down what you do – as you do it – integrating your data and observations as you go. Make sure to make explicit references to the lab write-up for any steps that you don’t include in your narrative (e.g. “steps 6-8 in the write-up were completed”). Record all data and observations, attach graphs and spread sheets and other data analysis (such as an example calculation of each formula used in your Excel spreadsheet), summarize results into tables, literature cited, etc. Include the manufacturer and model of any instrumentation used (but, not standard laboratory tools such as analytical balances or pH meters). Copies of all graphs, printouts, etc. must be included in your notebook (i.e., make photocopies or extra copies if working in groups). Attach copies of your graphs and spreadsheet print-outs to your lab report. It is not acceptable to cite your partner’s notebook for any table, graph, calculation etc. **It is not acceptable to write on pieces of scrap paper and later copy “neatly” into the lab notebook!** All data entries must be securely and neatly attached to a notebook page. Attachments that hang out of your notebook can get torn, tattered or destroyed, so please keep each attachment within the notebook.

General comments on recording data: Your notebook serves as a record and proof of each experiment that you do in the laboratory, no matter what the outcome! Because your notebook is to be filled in as you do each experiment (you are not allowed to write it first on another paper and then recopy it into your notebook later), your notebook need not be perfect. However, your entries must be legible. Your notebook will never look exactly like anyone else’s, but others should nevertheless be able to duplicate your experiment from the information that is written in your notebook. You must also indicate any collaboration on each and every graph and data table caption.

Use a non-erasable ballpoint pen (water impervious). When you make a mistake, put a neat line through the mistake (NOT multiple lines or squiggles or scribbles that make the error unreadable). Correction fluids are not allowed. Do not rip out pages. All pages should be used, do not leave pages blank. Your overall record keeping skills will be part of the lab report grade.

Lab notebook evaluation: Your lab notebook will be checked at the end of each lab day and will be 10% of your lab report grade.

Laboratory Reports: Your laboratory report for each laboratory experiment is due one week after the completion of that experiment (you will turn in your completed report at the beginning of your next lab session). The report will typically address such questions as: What was the experimental objective? What were the results? What conclusions can you make relative to your original objective? Were your results expected or unexpected? What were the random sources of error in the experiment and how might each influence the resulting reported value(s)?

Be THOROUGH AND CONCISE in your responses to thought-type questions found within the experimental handout. Your discussion needs to be typed into the report form supplied for each laboratory experiment. Type in the necessary information to complete the report, print it, and bring it to your next lab meeting. The report counts as 65% of your lab grade. A 25% penalty per day will be assessed for reports turned in late (after your pre-lab is submitted).

All applicable graphs, Excel tables, worksheets, and instrumental printouts must be attached to your lab report.

Grading: Your laboratory grade represents 30% of your overall grade in CH145. Once the lab lecture begins, you are late and will earn a zero for the lab work. For very serious, blatant, or repeated safety violations after a warning, you will be dismissed from the laboratory and receive a zero for that lab exercise. We are required to enforce proper safety practices and appreciate your cooperation.

Each experiment grade will be derived from the following items:

- A) pre-lab assignment (a measure of your preparation for the experiment) **25%**
- B) lab report (includes an objective, thoughtful presentation of results, considers consequences of errors as well as source of each, summarizes findings, demonstrates a clear understanding of chemical concepts involved, stays within a two page limit, cites sources used, attached report sheets, spreadsheets & graphs, turned in on time, etc) **65%**
- C) notebook check **10%**

Missed labs: You are required to attend your assigned lab section (on time!) and to complete every experiment. If you cannot attend your lab due to illness or athletic competition, you must make PRIOR arrangements with your laboratory instructor. If you are sick, notify your advising dean and your lab instructor. The lab instructor must receive verification from your advising dean of this illness once the advising dean has received verification from the Health Center. Laboratory work will not be made up for unexcused absences, nor will it be made up if you are late to lab. In both cases you earn a grade of zero for this work and your course professor and advising dean will be notified. Please refer to the attendance and exam policy in the course syllabus.

Intellectual responsibility: All written work that you submit (including pre-lab assignments) must be your own. If a lab instructor observes students sharing / copying any lab work that is not specified in the lab write-up as collaborative, all students involved will receive a zero for that assignment. All answers to questions must be in your own words, and you must perform all calculations yourself, **even when working with a partner.** Academic dishonesty will not be tolerated. If any assignment is found to contain copied work, it will receive a grade of zero and the responsible student(s) will be reported to the Dean of Student's Office. (Please refer to the attendance and exam policy stated in the course syllabus)

CHEMISTRY 145 - FALL 2014

LAB SCHEDULE

Week of	Laboratory
2: Sept. 8	1: Synthesis of Tris(2,4-pentanedionato)chromium(III)
3: Sept. 15	2: Fluorescence Quenching of Fluorescein
4: Sept. 22	3: Bond Strength of Nitric Oxide
5: Sept. 29	4: Molecular Modeling I: Molecular Orbital Calculations
6: Oct. 6	5: Vapor Pressure of a Pure Liquid
7: Oct. 15	6. Chemical Kinetics: Rate Law for Reaction of Crystal Violet
8: Oct. 20	7: Chemical Equilibria: Formation of Iron(III) Thiocyanate Complex
9: Oct. 27	8: Electrical Conductivity of Aqueous Solutions
10: Nov. 3	9: Weak Acids and Bases: Titration of a Weak Acid
11: Nov. 10	9: Weak Acids and Bases: Buffers
12: Nov. 17	10: Molecular Modeling II: Molecular Mechanics
13: Nov. 24	No labs (Thanksgiving)
14: Dec. 2	Cleanup (mandatory attendance!)