

## SYLLABUS

Chemistry 321 - Quantitative Analysis Laboratory

Fall 2007 – Dr. Atkinson

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Course Website: <http://www.chem.pdx.edu/~atkinsdb/teach/321/>

**Caution!! This lab is run differently from most, it would behoove you to read this syllabus carefully before coming to lab the first time.**

**Text:** (same as the lecture) Skoog, West, Holler and Crouch, **Fundamentals of Analytical Chemistry 8<sup>th</sup> ed.**, Brooks/Cole Thompson Learning, 2004. The laboratory experiments (Chapter 37) are now contained on a CD which came with the text in Adobe portable document (pdf) format. The CD also contains an interactive set of reading and problems on various topics in the text, as well as a number of useful modules (e.g., an interactive periodic table.) The text is extensively supplemented by web-based materials (**webnotes**) as described below. You will need to access both the **webnotes** and the material in Chapter 37 for the course, but if you are only taking the lab, please see me (Dr. Atkinson) before purchasing the text.

**Equipment:** You are required to have chemical splash safety goggles. I also recommend a lab apron or lab coat and gloves, since you will be handling strong acids and bases in this course. You will need a new bound, numbered page laboratory notebook for recording data. (The blue or black notebooks at the bookstore are acceptable, but you may have to number the pages yourself, and goggles and gloves are available at both the bookstore and chemistry stockroom.) You will need the goggles and notebook for the first officially scheduled lab period. **\*\* Make sure you attend lab the first week.\*\*** *You are responsible for all laboratory equipment checked out to you.*

**Preparation:** Before coming to lab, you must have read over the applicable information on the CD (or in the text) and on the web (see schedule and **webnotes** section below) and have summarized the information into a procedure in your lab notebook. Otherwise the TAs will be instructed **not** to let you begin experimental work. (You should not be bringing your expensive textbook to lab, where it is likely to be destroyed.) Unlike many of the labs you will take (but like the “real world”) there are real dangers in this course – strong acids and bases, oxidizing agents, flames, etc. - all of which are minimized by proper preparation and comprehension of the task at hand.

**Spreadsheets:** As part of the preparation for lab, it is strongly suggested that you prepare a data analysis spreadsheet in **Excel**. There will be several workstations available for your use during lab. Since you are required to present your fully analyzed results before you leave each lab period, you will find that this step greatly streamlines and simplifies the data workup. Graphical results (e.g., titration curves) will only be accepted in computer generated format (no graph paper.)

**Lab notebook:** You are required to keep a laboratory notebook throughout the term and will hand it in for a grade near the end of the quarter (see **Grading** section below.) Have a look at the format suggested in Chapter 2, section I of the text. You will also need a synopsis of the procedure for each experiment to work from and spaces for the data and observations to be recorded. (Your notebook is what should be open on the lab bench while you work.) You should also have a short section summarizing your results, including the mean, standard deviation, and relative standard deviation for replicate samples. The TA will write your grade here and sign it at the completion of the experiment. When graphs are produced, you should print them out and tape them in the book as results. (When I grade the notebooks, I will be looking for procedures, signed results, and graphs, as well as general features described in the text.)

**Webnotes:** This section of the course website will be indispensable for you and will be available anywhere you have access to a computer and the internet. The **webnotes** will provide you with specific information about the experiment that will be performed, as well as background on the methods and important safety information. This information is supplemented by the material on the CD from the text, to which the **webnotes** often refer. You can print all of this information out on your computer at home and produce a “hardcopy” version if you wish, but I think you will find this to be unnecessary. In reading the **webnotes**, you can extract the essential procedural details and safety information for your notebook, while familiarizing yourself with the theory behind the experiment. You will probably find it easier to identify the crucial information (“separate the wheat from the chaff”) as you go through the course, a useful skill in itself. {Hint: since the **webnotes** are an electronic media, you can “cut’n’paste” information to build procedures, which can be printed and taped into your lab manual.} Again, you are discouraged from “cookbooking” the labs using printed copies of the **webnotes**.

**Grading:** The laboratory is graded on how well you do the required analyses in terms of your accuracy and precision (often 5 points each.) You will present your results for the days’ lab to the TA before you leave and you will be given a grade (out of 10) on the spot. *You may repeat any single replicate determination at a cost of 1 point per re-trial, provided that you can finish before the end of the lab period.* There are eight graded labs for a total of **80 points**. I will grade your lab notebook at the end of the term (**10 points**) and the TA will provide an assessment of your general preparation and lab technique (**10 points**) for a total of **100 points**.

**Missed lab / tardiness policy:** YOU MUST TRY TO ATTEND ALL SCHEDULED LABORATORY MEETINGS. If you miss a lab you must notify your laboratory instructor as soon as possible, but well before the next laboratory period. The TAs have office hours and email addresses, so it is easy to contact them. There will be one make-up laboratory session at the end of the term. If you miss a laboratory meeting, you **must** make it up during the course or at the make-up lab. If you miss two or more labs, you **will fail** the course. Tardiness: If you are more than 15 minutes late to lab, you will be marked late, and may be told to leave, depending on how late you are. If you are repeatedly late, you **will fail** the course.