Chemistry 4511: Advanced Physical Chemistry Lab

Xiaoyang Zhu

Syllabus: CH4511 – Fall 2002

Instructor: Prof. Xiaoyang Zhu; e-mail: zhu@chem.umn.edu
Office Hour: Thursday 1:30 – 3:30 pm; Office: Smith 239.

Organization:

Students will work in groups of 2 or 3. Each student will choose lab partner(s) on the first day of class. Each group is expected to complete all labs. Each group will be assigned a sequence of experiments on the first day of class. If one member of the group is not present in a particular class, the remaining member(s) of the group should still complete the experiment. Notify one of the TA’s of the situation.
You are required to study the specific chapter in the lab manual before coming to class.

Write down all the questions you have and ask a TA before starting an experiment. A useful reference is “Experiments in Physical Chemistry” by D. Shoemaker, on two hour reserve in Walter library.

Each experiment is designed to be completed within a single 3 hr period. In cases of instrument breakdown or personal illness or emergency, make up experiments can be carried out at the end of the semester. However, each student must obtain permission from the TA and/or Instructor for this purpose.

During the lab:

Except for experiment 5, all experiments require an experimental kit that must be checked out of the stockroom in 360 Kolthoff. You should check out the kit before coming to class. You must return the kit before 4:25, by which time the stockroom closes. Students who fail to do so will be assessed a $1.00 fee. When you enter the lab, you should go directly to the experiment and start immediately. A TA will give you a brief lecture on each experiment and assist you in getting things started.

Writing up the lab & grading:

This course is intended to teach students the scientific discovery process, in particular, how physical chemistry concepts are developed and verified in experiments. The advancement of science is based primarily on the exchange of information. In this regard, the
evaluation of a particular piece of experimental work by others is based mainly on the contents of a written report. Therefore, assigning a significant amount of writing is a critical component of the Advanced Physical Chemistry Laboratory. This course requires formal lab reports written in the style and format of scientific publications. FORMAL REPORTs are required for three experiments: (3), (6), and (9). Each of these three experiments will be scored based on a total of 100 points. SHORT REPORTS are required for all remaining experiments. Each of these six experiments will be scored based on a total of 60 points.

Lab reports are due at the beginning of the lab (1:25 pm) one week after you have completed the experiment. Extension must be approved by the TA, only for illness or emergency. Otherwise, there will be a 20 point deduction if you are late for the first week and 10 points for each additional week. Although students within the same group will use the same data, each student must write an original and independent report. You will not receive any points if scholastic dishonesty is discovered.

There will be lectures devoted specifically to writing the formal report at the beginning of the semester. Students will also receive feedback from the instructor as well as the grading TA.

**Guidelines on lab reports:**

**Short reports.**

- Cover sheet with your name, names of lab partner(s), the title of the experiment, and the date
- Graphs and Tables of data
- Calculations. Show in detail the calculations you used to obtain the results.
- Error analysis & estimates
- Answers to all questions posed in the manual for that experiment.
- Copies of your lab notebook and any instrumental or computer output

**Formal reports.**

- A style suitable for publication in a scientific journal
- See instructions & samples distributed at the lecture.

**Monday Lectures**

During the first half of the semester, there will be lectures covering general topics that are important to doing experiments and writing reports. Examples include: “Experimental data and error analysis”, “How to write a report?”, “Common laboratory measurements”, “Data acquisition and computer control”, etc. TAs will also provide feedback on your writing.
Research proposal and presentation

During the second half of the semester, each group is required to write a research proposal and give an oral presentation on the proposed project during the Monday lecture time period. The proposal should be a research project aimed at carrying out a physical chemistry measurement or simulation on a subject of your choice. Both the proposal and the presentation will be graded, with a total score of 100.