

**CHEMISTRY 434 Instrumental Methods in Physical Chemistry Laboratory
Fall 2009**

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Office Hours: M 11:30 am-12:30 pm
TR 11:30 am-12:30 pm
Or By appointment

Lab Meeting: Lecture, M 10:30-11:30 am, Reichardt Building, Room 204
Laboratory, TR 8:15-11:15 am, Reichardt Building, Room 245

Required Material: Lab Experiments will be provided
Bound Laboratory Notebook

Extra Materials: A. M. Halpern, Experimental Physical Chemistry
D. T. Sawyer, W. R. Heineman, J. M. Beebe, Chemistry Experiments
for Instrumental Methods

Physical Chemistry lab is run differently than other chemistry labs. The actual results you obtain as well as your understanding, interpretation, and communication of these results are equally important. Success in Physical Chemistry lab comes from you, the student. You will need to carefully prepare, plan, and execute the experiment using not only the lab materials provided, but also any other outside materials that you provide with minimal instruction from me. The goals of the lab are to:

1. Give you experience in designing experiments and including safe lab practices in your designs.
2. Develop the ability to use standard analyses to correctly describe the numerical significance of experimental results.
3. Learn to work successfully in groups.
4. Improve lab notebook writing.
5. Successfully communicate the results of your work in written reports.

The lab this semester will concentrate mainly on spectroscopy executing the fundamentals of physical chemistry; thermodynamics, kinetics, and quantum mechanics. Each week on Mondays' lecture period, a review of the lab, an overview of the background material, any changes made to the lab procedure, and what is expected in the written report will be discussed. It is important to be attendance for this lecture, since the laboratory periods are for doing the experiment, not trying to figure out what you are supposed to be doing and why.

The lab is scheduled for Tuesday and Thursday mornings from 8:15 to 11:15 am. You are *expected* to be in the lab during this time period unless I officially excuse you or you

are done with the scheduled exercise. If you are unable to finish the work in the allotted time periods, it is up to you to find a workable time between the instructor (not the TA) and yourself in order to finish up with at least 24 hours in advance notice. I understand that unavoidable incidences do occur and these will be dealt with on a personal basis in order for you to complete the laboratory experiment within the scheduled time.

For the 7 experiments, you will work with a partner; however each member of the group will need to submit their own lab notebook and lab report per lab exercise. You will work as a team to acquire the data, and may work together during the data analysis, but each person will write their own lab report and will be responsible for writing up ALL parts of the lab.

The 7th experiment is a project; where you and your partner will pick an experiment developed on your own where you will design, analyze, and write the report (more information will be provided during the semester). You and your partner will also present a 25 minute power point presentation with 5 minutes of questions (30 minutes total) about the theory, design, implementation, analysis, and results of the Project Lab. The oral presentations will be held during the final exam period, Friday, December 18th from 10:15 am to 12:15 pm

Lab reports are due at the start of lab as noted on the accompanying schedule and are to be submitted in writing(typed). Late reports will be penalized as follows: reports turned in after 8:15 am but before 12:00 pm Thursday will be assessed a 5% penalty; those submitted by 5:00 pm on Thursday will be assessed a 10% penalty; those submitted by 8:15 a.m. the next day will be assessed a 25% penalty; any reports submitted after this time will be assessed a 50% penalty.

Mandatory draft lab reports are required for the first 2 labs, which are to be turned in at the start of lab as noted on the accompanying schedule and are to be submitted in writing(typed). Please note you will have the option to turn in draft lab reports for the other labs to be edited and returned, these drafts also are due at the start of lab as noted on the accompanying schedule. Any required or optional draft lab reports that are late (turned in after 8:15 am) will not be edited.

A Google calendar of all due dates and class periods can be found here:

<http://www.google.com/calendar/embed?src=v24knoo1qf4mb52hkabtt0rgss%40group.calendar.google.com&ctz=America/Anchorage>

Grades:

A total of **3000 points** are possible for Chemistry 434 and are explained in the table below. *Please note that your grade is in your hands.* Any assignment/lab report that is considered excellent (answers are complete/correct, format has been followed, a solid

grasp of the material is demonstrated, and work substantially exceeds minimum requirements) will receive an A. Consistent submission of excellent work will earn you an A in the course. I also reserve the right to adjust these percentages *only in the students favor* when assigning final grades. Please note that all assignments, excluding oral presentations, must be typed. Handwriting on assignments will not be accepted.

Letter Grade	Percentage Grade
A+	96.5 - 100
A	93.5 - 96.4
A-	89.5 - 93.4
B+	86.5 - 89.4
B	83.5 - 86.4
B-	79.5 - 83.4
C+	76.5 - 79.4
C	73.5 - 76.4
C-	69.5 - 73.4
D+	66.5 - 69.4
D	63.5 - 66.4
D-	59.5 - 63.4
F	59.4

- Lab Reports (1800 points): Each of the 6 lab exercises will require a typed report worth 300 points and submitted in writing(typed). Lab reports are to be submitted to me before the start of the lab period of the due date. The labs will be graded as follows: 200 points for the written portion (format, grammar, ability to express scientific ideas and results), 25 points for the raw data (precision and accuracy), 50 points for data analysis and calculations, and 25 points for presentation of data (figures, tables, and corresponding captions).
- Draft Lab Reports (200 points): The first 2 lab exercises will require a typed draft report worth 100 points. Lab reports are to be submitted in writing(typed) to me before the start of the lab period of the due date. The labs will be graded as follows: 10 points for the title, authors, and affiliation, 10 points for the abstract, 40 points for the written portion (format, grammar, ability to express scientific ideas and results) for the introduction, 30 points for the detailed explanation of the experimental section, and the raw data (precision and accuracy), and 10 points for data analysis and calculations and for the presentation of data (figures, tables, and corresponding captions).
- Project Lab Reports (350 points): This typed lab report will also be submitted in writing(typed) before the start of the lab period of the due date and will be graded similarly to the other 5 labs. However, 75 points for the design, development, and executing the lab, 200 points for the written portion (format, grammar, ability to express scientific ideas and results), 25 points for the raw data (precision and accuracy), 25 points for data analysis and

- calculations, and 25 points for presentation of data (figures, tables, and corresponding captions).
- Notebooks (150 points): Entries (description, data, observations, calculations outline) for each of the 6 labs will be worth 25 points. **Before you can start the lab, a list of all chemicals, supplies, and equipment to be used in the lab must be written in your notebook.** I reserve the right to check Notebooks at anytime during each lab period. Please note any written notes, observations, details, etc written on paper **not** in your notebook (i.e. on scrap paper) will be confiscated and discarded at a loss to you and your partner as well as lost points in the notebook (-10 points per item).
 - Lab Maintenance (50 points): This grade reflects how well you clean up the areas you worked in. Consistently leaving things put away and clean will earn you 50 points. Otherwise: 45 points – things are left appropriately 90% of the time; 40 points – things are left appropriately 80% of the time, 35 points – 70% of the time; 30 points – 60% of the time.
 - Attendance/Tardiness (50 points): I do not expect people to skip labs nor do I expect tardiness. Unexcused lab absences will cost you 10 points per absence and tardiness will be 3 points for either lecture or lab. I also understand that life happens and each student will have 1 free miss lab pass.
 - Final Project Presentation (200 points): You and your partner will present a 30 minute (25 minutes with 5 minutes of questions) power point presentation about the theory, design, implementation, analysis, and results of the Project Lab exercise. The oral presentations will be held during the final exam period as determined by UAF, which is listed in the laboratory schedule.
 - Extra Credit (200 points): You will be allowed some possible extra credit points for the course, which can be discussed with the instructor during office hours. Note that these projects will be difficult and, if chosen, will be graded stringently and may not result in attainment of the full 200 points of extra credit.

Lab Policies:

- You are expected to be familiar with all policies, procedures, scheduled labs, and due dates outlined in this syllabus and the accompanying documentation regarding preparation of lab reports and keeping lab notebooks.
- Lab time is at a *premium* in this course and I expect you to spend the lab time performing the lab rather than figuring out how to do the lab. If you have finished acquiring raw data before the lab before the period ends, you are **strongly** encouraged to continue working on the lab through the entire lab period given that you, your partner, the TA, and I are available during lab time.
- Time for data analysis, discussion, and writing of lab reports is built into the schedule, therefore, you are **required** to attend these lab periods and **work** on the lab(s). Absence, leaving early, or working on other class assignments is unacceptable and disrespectful to me, the TA, the class, your classmates, and your lab partner.

- If you need more time in order to complete the experiment in the instrumentation or wet chemical laboratories, you must get approval from your instructor and the scheduled time must be approved with at least 24 hours advanced notice.
- Office Hours, if you need to see me outside scheduled office hours, please feel free to stop by or make an appointment. Please remember helping you outside scheduled office hours without an appointment or outside normal working hours (M-F, 8-5) is a courtesy granted at my discretion and limited by my schedule.
- Since you are working in groups, you are encouraged to work together on the labs; however, each person needs to submit their own work, including the written sections, data analysis, figures, tables, captions, and references. If you choose to share figures, tables, or text with your partner or other groups, you and your collaborator(s) will receive a 0 for it.
- Students of Plagiarism, Cheating, or Disruptive behavior will be disciplined following UAF policies and procedures, www.alaska.edu/bor/regulation/9r/r09-02.html
- Regrades, if you feel a mistake has been made in grading, you may request in writing for it to be regarded, though please note “regrade” means that I regrade the whole paper again, not just the section you have discrepancy with. Regrade requests are to be made in writing and accompanied by the assignment you feel contains an error within 48 hours of the laboratory report being returned.
- Points lost due to late work, tardiness in lab, unexcused absences, shared lab reports, or failure to clean up cannot be made up.
- There are no makeup labs! You will be excused from lab only in the event of some extraordinary circumstance/unavoidable tragedy.