CHEMISTRY 133
Spring, 2016
Laboratory Schedule

Tentative Laboratory Schedule:

Experiments	**Period**	
Check in and Statistics/Electronics Demos	Jan. 26	
Set 1: Electronics	Jan. 28 – Feb. 4	
	Make up Day Feb. 9	
Set 2: FTIR, Fluorescence, GFAA		
GC, HPLC, GC-MS, and NMR or UV-Vis	Feb. 11	Introduction/Discussion
	Feb. 16 – 23	First period
	Feb. 25 – Mar. 3	Second period
	Mar. 8	First make-up period
	Mar. 10 – Mar. 17	Third period
	Mar. 29 – April 7	Fourth period
	April 12	Second make-up period
Term Project	remainder of term	

Group Size: All of the lab experiments, including the term project will be done in groups of 2.
Group Selection: Students may select their own lab partners. However, you may work with the same lab partner for a maximum of 3 experiments, including the term project.
Restrictions on Set 2 Lab Selection: Each student needs to do at least one chromatographic experiment and one spectroscopic experiment. Two instruments are available for the HPLC labs, while for all other experiments, only one group at a time may work. The GFAA will only be available when not used by Chem 31 (first two periods and only after 4:30 for next two lab periods).

Lab Reports (also refer to the lecture syllabus as how the lab reports are graded):

A. Format:

1. Introduction: 1 paragraph statement of purpose of lab and background on instrument.
2. Experimental Section: describe what was done. Be sure to describe instrument settings, particularly if various conditions were optimized.
3. Results and Discussion:
    a) give "raw" data (spectra, chromatograms, fluorescence readings, etc.)
    b) give calibration curves (if necessary)
    c) explain all tables and graphs so that the important information can be obtained from them
    d) explain how the instrument was optimized for your analysis (if necessary)
    e) explain any necessary calculations or statistical treatment of the data
    f) give uncertainties if asked for
    g) answer questions in the laboratory handouts
    h) discuss how your results turned out and limiting features (what you thought limited resolution or sensitivity)
4. Summary: give the most important findings of the experiment.

B. The report should be 3 to 5 single-spaced typed pages of text plus tables and figures with additional instrument output in appendices (if needed). Be sure to refer to all figures and tables and each figure or table should have a figure/table caption.

Lab Practicals

You will be allowed the option of taking a lab practical in place of turning in only one of the lab reports. This will only be allowed for a subset of the experiments, and for reasons of time limitations, there may be a limit on the number of students who can sign up for a lab practical on a given date. Students will need to inform the instructor that they wish to take a lab practical at least one week before the due date of the lab report and will generally need to take the lab practical on or near the due date.

The lab practical will consist of being asked to demonstrate how to use an instrument to perform a specific task and to interpret the results. It is expected that the lab practical will take about 30 minutes. Your grade will depend on: 1) being able to perform the assigned tasks in a timely manner, 2) quality in using the instrument to make measurements (e.g. demonstration of using an instrument under good operating conditions), and 3) proper analysis of the data. An example of a past lab practical for the electronics lab is given below.

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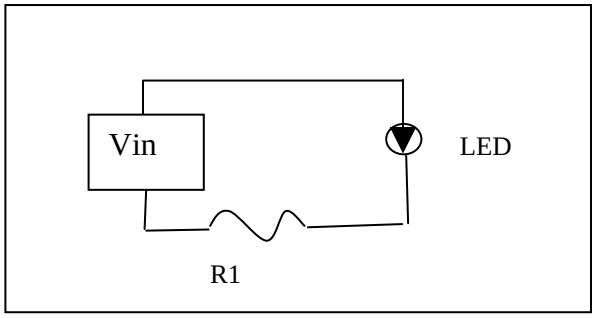
ELECTRONICS LAB PRACTICAL - Example

1. Set up the following circuit (see below). For V_{in} use the square wave with amplitude of +10 V (top of square wave) and – 10 V (bottom of squre wave) and a frequency of 10 to 100 Hz. For R1, use a value between 1000 and 5000 Ω. **Measure the voltage drop across the resistor as a function of time. Explain qualitatively what you see. Estimate the current flow through the LED under the two conditions (e.g. +10 V in vs. – 10 V in)?** (40 points)



2. Using the black box with holders for light transducers and light sources, set up a circuit to measure the attenuation of light by different dye solutions in cuvettes. The cuvette will fit in between the light source and light transducer. **Determine which dye solution (of solutions A through D) absorbs light most strongly and which the most weakly when using the yellow LED as a light source**. (30 points)

3. Determine the on and off periods for the bike lamp in the mode with observable blinking. (30 points).