Experimental Physical Chemistry Assignments and Schedule

This laboratory will feature laboratories designed to reinforce concepts and data manipulation introduced in the lecture section. You will be responsible for assembling the laboratory equipment and preparing all solutions. Upon completion of the laboratory, you are required to disassemble the apparatus and clean all equipment and dispose of all solutions. You are required to keep a very detailed laboratory notebook having consecutively numbered pages with dates, commentary and data. Measurements must be taken with as much precision as is possible and include an estimation of the confidence of the measurement. I will be here to help you with these techniques and assist with the construction and operation of all laboratory equipment.

Laboratory Assignments

- Preliminary Lab Assignment for January 11:
 - Read the entirety of provided material. Complete and submit the exercises listed below.
 Due January 18

Worksheet – Data and Statistics **Worksheet** – A Case Example of Statistical Analysis

- Select your working partners for the lab. If there is an odd number, there will be one group of two. Labs will be adjusted as necessary to insure an even work load.
- Select the first lab to be completed and notify me. A Dropbox folder will be created and material for your selected laboratory will be provided.

You will apply the appropriate techniques in this lab assignment to each of your analysis in this laboratory.

• (8 weeks) - January – March.

Your group will be assigned laboratory experiments reflecting many areas of physical chemistry. Each group will be given an equal amount of work albeit may not be the same number of laboratories.

Group I: (to be completed first)

(Est. 1-2-weeks) – Requires Lab Archives

\triangleright	Gases	Heat Capacity Ratios of Gasses	Experiment 2
\triangleright	Determination of the C	oefficient of Expansion	JCE 92 (2015)

Group II – Moderate Development Required – Select One (Est. 2-3 weeks) – Requires Lab Archives

\triangleright	Thermodynamics	Bomb Calorimetry	Experiment 5
	For 3-persons add	Efficiency of Fuel Samples	
\triangleright	Kinetics	Consecutive Reaction Kinetics	Experiment 22

Group III – Quantum Mechanics and Spectroscopy: (Est. 2-3 weeks) – No Lab Archives

Vibronic Spectra of I ₂		
and Intrinsic Reaction Coordinate Paths Computation:	Handout	
Ammonia Inversion HCN to HNC transition	Handout Handout	

• April

From April on, you will be able to work on your comprehensive project exclusively, completing it and submitting a complete lab instructional write-up and representative data.

Development Labs: Select one. – Requires Lab Archives

Experiment 6 + Supplemental – Resonance energy of Benzene