Outline Of What To Put Into Your Lab Report

The labs in Phyx 335 are conducted by teams. The lab report is a group effort, and everyone within a team receives the same grade. It is not necessary to identify – and in fact I prefer that you not identify – who did what in the lab. It is perfectly acceptable for one member to take the data, a second to do the analysis, and a third to write the report. I don't recommend this because it is good if the team members double-check each other, and it is easier to pull the final report together when you don't have to spend time describing every detail of what you did to someone who wasn't there. But, the division of labor is up to you.

The following points are suggestions rather than rigid rules. However, they are good suggestions.

• First, succinctly state what it is you are trying to measure or demonstrate.

• Explain how one gets from any input factors to the desired measurement. This might involve a lot of math; it might not. (There is no need to reproduce derivations that are given in the on-line PDF files; you can just write down the relevant equations and say, "Behold!" $\lambda = h/m$, $\frac{1}{2} mv^2 = eV$. But please reference the lab write-up or the class textbook.) At a minimum, there should be a brief discussion of the physical principle(s) your measurement is attempting to verify or quantify.

• Generate a list (or a chart, or a table) of every factor that you need to know to make the measurement. This can be as mundane as the length of string you tied to the hyper-hound from the 11^{th} dimension to anchor it in our dimension, or as complicated as the $(n + 1)^{\pi}$ bursts of irrational energy that you needed to apply to the 11^{th} dimension to make the hyper-hound materialize.

• Once you have identified the variables that need to be measured (or perhaps just set by hand), indicate how hard this is to do. Press one button and the lab computer gives you the ultimate number to 39 decimal places? Or do you need to make many measurements to allow for statistical error, or perhaps drift in the experimental apparatus caused by changes in humidity, the line voltage, etcetera?

• Include commentary as necessary to describe the date acquisition method, steps taken to minimize any known problems, the way you went about doing your experiment, etcetera.

• Show the data. All of it. Include the times when it was taken, if it was not taken at one time.

• Discuss the data analysis. You do not need to write out the details of standard statistical procedures. If you perform a linear least-squares fit on some X-Y data points, then just say that and generate a graph that shows the raw data points and the line fit. Discuss how things turned out. Was your result far wide of the value predicted by theory? Did different data runs, perhaps from different days, yield the same result or was there a mysterious 12% variance? Depending on exactly how wide the variance is, you should at least speculate on what caused it.

• Summary. This is the educational part. Was there anything about this experiment that surprised you, given a textbook description of the physics? In other words, did you learn something that you hadn't realized before? Was some part of the experiment much more frustrating/hard than you thought it would be? Was some part much easier? Why?

Lab Reports are always due (in class, at 3 pm) on the Monday following the lab orientation.