General Physics Guidelines for Laboratory "Articles"

August 29, 2007

Over the course of the semester, you will be performing experiments in the physics laboratory in which you will testing physical laws or measuring phenomena. In most cases, you will be responsible for designing your own experimental procedures based on the theoretical analysis described in the laboratory manual or done on your own. You will be reporting your experimental results in the form of an "article", just as professional scientists do in journal articles. The form of your "article" will closely parallel that of a scientific paper. The following sections describe the content of the sections which ***must*** be in your paper.

1 Introduction

The Introduction of your article, serves to explain to the reader what you intend to measure and any theoretical background that is necessary for the reader to understand the motivations for the experiment. Any equations or derivations that are needed to "set the stage" for your experiment should be included.

2 Experimental Methods

In this section, you will describe how you carried out the experiments. Make sure that you detail how you measured quantities. *Do not include experimental data here!* For example, you will need to detail how and why you measured the length of extension of the spring in the first experiment. You need to include a discussion of any systematic errors which might arise from the way you are making your measurements.

3 Results and Discussion

Here you present your results and discuss their implications. Do not list data tables (we want to kill as few trees as possible!), rather present the results of your analyzed data. This may be in the form of averaged values (with proper error analysis) or as plots (visual representations are good!). For example, in the first experiment, you can present a plot of spring extension versus mass and put the straight line fit which shows the spring constant. There is no single way to present results so you are responsible for laying out your results in a convincing fashion and assuring the reader that you know what you are doing and have properly taken into account all questions.

4 Conclusions

This is a section in which you can "get your final word in". You should reiterate what you were trying to measure and summarize your findings. Meaningless phrases, such as "this was a stupid experiment" are not necessary or acceptable in a conclusion.

5 References

If you have used any outside references in conducting this work (even discussions with someone outside your lab group), you should cite them in the text with a number in square brackets,[1] and put a citation in this section. The form of the citation for book would be:

1. *Fundamentals of Physics, Sixth Ed.*, D. Halliday, R. Resnick, J. Walker, p126 (John Wiley & Sons, New York, NY, 2001).

6 Original Data Sheet

The original, signed data sheet must be attached to the “article”.