PHYS3330 Lab Report Guidelines
Spring 2010

The written lab reports in PHYS3330 are as important to the course as written essays in, for example, an English Literature course. A critical skill (for everyone, not just physicists) is the ability to provide an organized, logical presentation of one’s work, with a minimum of superfluous (confusing) material. Keep in mind that while brevity is the sole of wit, too little information also leads to confusion. Data needs to be plotted in a clear and meaningful way. Well laid out diagrams and sketches are the only way to describe something clearly with a minimum of words. Thus what we are looking for is critical judgment from you in the creation of the report, not for blind adherence to a format. Some of the experiments are actual physical measurements; some are demonstrations of a technique or of the assembly of a particular type of circuit. Your write-up needs to reflect these differences.

In general, typical reports will be no more that 5-7 pages. They should be independent of the lab manual, that is, one should be able to understand what was done in the lab without having to read the lab manual. This means that you will need to write some narrative with diagrams explaining what you did and why you did it. As a technical point, we expect all graphs/plots to be produced with a computer program, rather than sketches by hand (you can use the program of your choice!). The actual text, circuit diagrams and other sketches can be written/drawn by hand and must be legible. As always in 3330, efficient use of your time is a critical issue; if you find yourself spending lots of time getting fonts and formats just exactly the way you like them, you are probably wasting your time. We are much more concerned with organization and content than with typographical issues (though these have their place). A sample “experiment” subsection (discussed below) and a sample data plot are posted on the website.

With the discussion above in mind, a rough outline for a lab report will consist of the following:

1) Introduction and Overview for the whole (possibly multi-part) experiment. This does not need to be very long, but should provide the reader with a framework of what follows.
2) “Experiment” A (a simple sample of such a section is posted on the course web page).
   a) A description of what you did and why you did it. This will include figures and (circuit) diagrams. A well-written description here will save you lots of explanatory text later as well as organize your own thoughts. *Usually, this can be written before you even do the lab!*  
   b) Your data and data analysis. Note this requires explanation! If the data are just a few numbers they can be given in the text; a bit more data can be presented in a table placed within the text. Pages of data should be placed in an appendix and referred to in the text. This section should contain an analysis of uncertainties if one is relevant. *NOTE:* If after your lab section, you discover that something is “wrong” with your data, you need to go back outside of your scheduled lab time, and re-do the measurements. You will receive less credit for the lab if you just report data that are not really at the level achievable. The best way to prevent wasting your time is to do as much data analysis as you possible as you take the data the first time!
   c) Interpretation of your results and conclusions. This can vary a lot depending on the actual experiment and should not just be a blind re-iteration of your description from part a). Strive to make this a meaningful section. Sometimes it will be more of a summary; sometimes it will be more interpretation/conclusions.

3) “Experiment” B – Same a), b), c) points in experiment A.
4) “Experiment” C – Same a), b), c) points in experiment A.
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N) Overall Conclusions and Summary. This final part can at most be 1-2 paragraphs. Why does one write this? A reader who reads the whole report doesn’t really need this section, but in scientific publications one usually provides a summary statement at the end, so that someone who is not interested in the details, can get an executive summary of the major points of the paper. Within the context of this course, this is not absolutely needed (the instructors are reading your entire report), so you should view it as a chance to practice summarizing your work, but perhaps more importantly, use it as an opportunity to discuss why this particular lab was made a part of this course. For example, were particular skills required to complete the experiment, which are as important as the experiment itself? Again, we are looking for discussion that is fit to the actual lab, not a recipe of re-iteration of other parts of your write-up.
Finally, it's a good idea to have a hypothetical reader in mind when you write. For this course, a good idea would be to write for a fellow physics major (who hasn't taken 3330 but has similar background to you). Imagine you are reading the report to him or her; does it sound corny? Boring? Interesting? Would you be happy to read your report to the class? If you are really motivated, you can pester your classmates by reading the report to them and getting their feedback!