

PHYS 310

Experimental Physics

Expectations for Lab Notebooks

Your lab notebook is the most important item that you will be using in this course. The notebook is a ‘diary’ of everything that you do in the lab and is therefore your only record of the procedures, data, and experimental results. Your lab notebook is also the prime source of information for the papers you will be writing in this course. Part of your grade for each lab in this course will be determined by the instructor reading your lab notebook entries. We cannot emphasize strongly enough the overall significance of the lab notebooks.

As a guide to learning how to make entries in your lab notebooks, here is a list of things to remember:

- Use a lab notebook whose pages are bound (not loose-leaf paper in a three-ring binder). Lab notebook pages should always be numbered and pages should never be torn out. If you do make a mistake on a page, just cross through the error and continue on. Never erase any entry in your lab notebook! Troubleshooting and error correction are major components to any research effort, so it’s important to document mistakes, errors, and problems as well as successful efforts.
- Your entries should be a complete record of what you did in the lab. They should be complete enough that one of your peers could take your lab notebook and faithfully reproduce the experiment that you did. This is very important because it is often the case that a researcher needs to go back and reproduce a previous experiment to ensure the integrity of the data.
- Each time you come to work in the lab and make entries in your lab notebook, you should indicate the date and time in your notebook. It may also be necessary to indicate times (as in 1:23 pm) in your notebook during the time you work in the lab. You should also start each day’s entry by a brief statement giving your intended goals for the day. Similarly, you should end each day with a brief summary of your results and future plans.
- When making entries in your lab notebook, you should give just enough background so anyone else reading your lab notebook can follow your procedure without having to refer to any lab handout you may have received from the instructor.
- Handouts should be included in your lab notebook either by pasting them in or by keeping them in a well organized folder or pocket.
- When experimental apparatus is used, you should give a block diagram of the set up, showing individual components and how they are interconnected. You should also clearly indicate any dial or meter settings that you used to take your data. This is of vital importance if you need to go back and check an earlier result so that you can set up the apparatus exactly as it was when you took the original data. For example, it is essential that you record all voltage settings applied to equipment as well as control

settings on apparatus used to make measurements; without a complete record, you'll be unable to check and replicate your results.

- Entries should be clearly legible so that others can read it, and you should have some kind of organization that makes it easy to understand what you are doing.
- Whenever you use the computer for data acquisition or data analysis, your notebook should include a description of the location and content of the corresponding directory/file(s).
- Depending on the volume of data that you need to take in your experiment, you may want to insert tables of data in your lab notebook. For instance, if you have a dozen or so readings from a meter as a function of some dial adjustment, a neat handwritten or printed copy of the data should be included. If you have thousands of data points (say from a numerical solution routine, etc.) then this is not necessary. However, in this situation, you will need to indicate in your lab notebook the location of the file containing the data.
- All graphs of data used to document your process should be attached to pages of your lab notebook, and not just placed in between pages. The graphs should clearly indicate what is being plotted on each axis (including units used!) with a reasonable scale for each axis. You should also keep a written record of the names and locations of computer files containing data and graphs so that you know which data files are associated with what pages of your lab notebook. Each figure should be clearly labeled with the used parameter set and with an interpretation (keywords are fine) of the shown results. We will provide a base location for each of you to keep all files related to your projects, to help facilitate our ability to assess your lab notebook.
- Final versions of all theoretical calculations associated with the experiment should be entered in the lab notebook.
- For computational/simulation projects, you should keep a record of the location of your computer files and the commands you used in your lab notebook. You may use logfiles for this purpose, but a print-out of the logfile should be included in your lab notebook. In addition, a print-out of clearly annotated source code should be included in your notebook, along with any relevant output.