

PHY/ENS 119 Laboratories

Laboratory Report Instructions

The labs are designed to teach you skills in investigating the basics of mechanics, heat, light, electricity, resonance, instruments, radioactivity and waves. Each lab requires careful attention to reading the instructions carefully, precise measurements and thoughtful analysis. If you take the labs seriously, your analytical skills will improve, your ability to think logically will grow and your ability to make careful measurements will be enhanced. These skills, which physicists are famous for having, will spill over into the other areas you study.

1. You will need a dedicated **spiral-bound lab book**, with graph paper. Loose leaf sheets are unacceptable. All notes taken and graphs made during the experiments are to be recorded neatly in the lab book. **BEFORE YOU LEAVE THE LAB EACH SESSION, YOU MUST HAVE THE TA SIGN EACH PAGE OF YOUR LAB BOOK.**
2. You must **make a copy of your lab book notes** and staple them to the back of your typed-up lab report (attached loose scrap paper and tear outs are unacceptable).
3. Typed Lab reports are to be brought to lab the next week.
4. We recommend that you use **Microsoft Word and Excel (or Google DOCS and SHEETS)** for your final report. Graphs prepared in this way can easily be imported into the text. Computer drawn graphs are strongly preferred over hand-drawn graphs.
5. All labs must be presented in the classical format, namely,

Cover Sheet: Name, course semester, student ID, due date.

Introduction (10 points):

- This should include a description of what physical principles you aim to investigate in your lab and a short description of how you will do so.
- While having an understanding of the theory is a benefit in this section, do not forget to connect the theory or physical principles to the lab itself.
- This section should not be more than 1 paragraph **AND IN YOUR OWN WORDS, not just copied from the lab instructions.**

Methods (10 points):

- This section should detail exactly what steps were involved in completing your lab.
- Treat this section as the methods that you used during the lab, not a summary of what you found.
- Involve all aspects of your lab procedure, as well as any changes or additions you may have had to make to the written instructions to obtain your results.
- **Do not copy the Methods section straight out of the lab hand outs! This should be in your own words.**

Data (30 points):

- In this section you should list all of the data taken during the lab. It should be organized into neat columns and understandable to the intelligent layperson.
- Lab data must be signed by the TA before you leave the lab for the day.

Discussion (30 points):

- In this section include any calculations, results and graphs. Charts or graphs must be large and legible (preferably produced in Excel or equivalent).
- Include any formulas used in your calculations as well as sample calculations for each result.
- You should also include error analysis in your results as well as in your calculations.
- Error analysis involves qualitative (describing in words) as well as quantitative (using numbers) when the lab calls for it. Discuss sources of error and the way in which they affected your experiment.
- For the sake of clarity, please copy any questions that the lab hand-outs require you to answer and put them at the end of this section.

Conclusion (20 points):

- What physical conclusions can you draw from your data?
- Describe not only what you discovered but how those results confirmed (or didn't confirm) your original expectations.
- When necessary you should have both quantitative and qualitative conclusions

6. **ALL** labs during the semester must be completed, submitted and graded, but **we will drop your lowest score** from the register.

7. **Attendance is required**; a sign up sheet will be circulated.

8. **Typically you will use the first two hours of lab for performing the experiments, and the third hour for preparing graphs for your lab report which you will complete at home.** The TA's will initial your lab notes and data *before you leave* to ensure that you have gathered sufficient data and plotted preliminary results. The Instructor and the TA will be available for each session.

If you need to reference or copy material from a book or website, please give the proper reference.

9. **Laboratory hard copy lab reports are to be handed in at the following week's lab.**

10. If you have a **documented disability**, which could make it difficult to meet any of the requirements of the course, please contact the instructor at the beginning of the semester.

11. **Academic Honesty:** you will work closely with a lab partner of your choosing, sharing responsibilities for conducting the experiment. You are encouraged to discuss problems and questions with other students. **However, the lab write-up you submit for grading must be your own work (not written jointly with your partner).**

12. **The University has strict guidelines for Academic Honesty**, which you should become aware of. Penalties for cheating are severe and can lead to dismissal. Visit the Stony Brook University website for further information at: