

Guidelines for Phys 322 Written Papers and Peer Reviews

The final results of many physics experiments are published in peer-reviewed journals (often in addition to oral presentations at conferences). In Physics 322 you will be asked to write papers for the Experiments 1 and 3, following the general format of prominent journals such as *Physical Review*, *Science*, or *Review of Scientific Instruments*.

Your data notebook and any original digital files will be the primary source of raw data for your report, though supplementary references should be consulted for additional measurements or theoretical models. Research papers should be prepared on word processors with citations, figures, and tables as appropriate. All experimental data should be carefully analyzed and thoroughly checked. Experimental uncertainties, both systematic and random, must be included in the results with the expected precision reflected in the number of significant digits shown. You should properly propagate errors through all stages of computation as described in the Theory of Error Propagation document on the course website. Further hints for scientific writing can be found [here](#).

Though you may perform the experiments with one or more other classmates, each student will submit their own individual paper. You may use the same data and figures as your classmates, but the write up should be in your own words. You may consult with your peers about content or conceptual questions, and you should acknowledge their contributions in your report.

The course website contains paper templates and tutorial videos for preparing Physical Review style papers in Latex (with Overleaf), though other word processing applications (eg Word, Google docs) can also be used. The instructors can help you debug formatting issues. Papers should be submitted digitally through Canvas.

Paper grades will be determined as follows:

1. Title, Author, Affiliation, and Abstract - 5 pts
Clear, concise, and appropriate while accurately conveying the main results
2. Introduction - 15 pts
Accurately describes relevant physical theories and motivates the experiment
Clearly states the main measurement goals
3. Methods and Procedures - 15pts
Describes how the experiment was conducted including the apparatus and techniques
Uses figures or diagrams to explain the setup
Includes relevant parameters or settings and steps necessary for data acquisition
4. Results - 30pts
Presents data (including plots or tables) as well as the relevant analysis.
Includes a discussion of uncertainty in the results and how it was derived.

5. Discussion of results and conclusions - 30pts

Presents a thorough interpretation of the results and connection to stated goals.

May include comparison to a theoretical prediction or other independent measurements.

Discussion of measurement limitations, alternate methodologies, or other improvements.

6. References and Acknowledgements - 5pts

References correctly cited throughout the text and numbered in order of appearance.

Acknowledgement of peer contributions or other assistance in data collection & analysis.

Total: 100

We will utilize a formal anonymous peer review process for both papers, which is designed to mimic the process used by scientific journals. Students will turn in a rough draft by the start of class on the due date, and they will be assigned other papers to review in class. They will prepare a brief written review of the work with constructive feedback, which will be graded based on the overall depth and quality. The review report will be provided to the author, who will have one week to revise and resubmit the paper. Only the final papers (not the rough drafts) will be graded by the instructors, though points will be deducted from the peer review grade for incomplete rough draft submissions.