

Guide for Writing Formal Lab Reports (306L)

Style: Lab reports should follow the style of a scientific journal article. Reports should have a neat appearance and be concise. It should not be apparent that you have followed a guide performing the experiment. Any physicist should be able to understand the motivation, methods and results without any prior specific knowledge of the experiment. Use a font size between 10 and 11 pt, and do not use margins less than 0.5 inch. Reports standard length is about 4 pages including figures and references.

Lab reports should consist of the following sections:

Abstract: The abstract is a brief statement of your methodology and results and summarizes what is contained in the report. It should briefly mention the motivation, the method, and results. If the result was the measurement of a specific quantity, the value should be included in the abstract.

Introduction: The introduction should contain discussion of the background and motivation for the experiment to put your work in a broad context, and contain a summary of the techniques/approach for your work. Include a summary with relevant references; provide theoretical background that is central to your work; and state the importance of your work.

Methods: The Methods section describes how the experiment was performed and how the data was collected, included a detailed experimental procedure. It includes the description of the main components of the experiment and how they work, identifying the features that are essential to your project. It should include a detailed diagram of the setup and important components, followed by a description of the data-taking procedures and measurements. The methods section shows your understanding of the experimental techniques.

Data: Give a narrative describing the results shown in tables and graphs with explanatory captions. Tables and graphs should be numbered and cited in order. Give the specific conditions under which your data was collected. Show the results of your measurements clearly and in a concise manner.

Analysis: Describe how your data was analyzed to get the results. Show relevant equations to make the analysis procedure clear. Identify the dominant sources of error and describe the methodology of your data analysis

Results: Describe the results of the data analysis along with the results of calculations.

Discussion: Compare your results with expected results. Comment on limitations of the experiment. Suggest improvements for future work.

Conclusion: Summarize the experimental approach, the primary result and why anyone should care, i. e. state the importance of your results.

Other Comments

Figures: Figures must be labeled with a figure number and the figure numbers must increment in the order in which the figures appear in the text. All figures must be referenced in the text.

All figures must include a caption with enough detail that the main concept of the figure is understandable from just the figure and caption and include all the relevant information. Plots must have axis labels with units. The font size for axis labels and numbers must be large enough to be legible

(8 point font or larger). Figures used from other sources must be accompanied by the appropriate reference. No hand drawn figures are allowed.

Use of tables: Whenever possible, present data using plots, rather than in tables when convenient.

References: References should be cited in the main text and the list of references should appear at the end of the manuscript.

Use a space between value and unit: "Data was collected for 10 s." not "Data was collected for 10s."

Note: Use your own words in writing your report. Your report should highlight your mastery of the experiment and the underlying physics being studied. Copied sections will result in a null grade. plagiarism a serious form of academic dishonesty.