

Writing and Presentation Comments:

1. Cool cover sheets do not make up for "thin" discussion of your results.
2. Use plots/figures to support your discussion. The biggest rule of plots is clarity. A plot that is too full/too fuzzy/unreadable is useless.
3. Grid lines make plots much more readable making your data stand out. Ensure that the grid lines are not the same line type as any of the data curves. Label all axes and give units, so the figure is useful.
4. Start your plot at $x=0$, $t=0$, and with a step input. You don't need to plot all your lab data! Just sufficient to show your main results (e.g. 1-2 step inputs). Think about plotting several things on the same plot.
5. If you have two figures that the reader will want to compare, keep the axes scales consistent.
6. Present plots in the text of the discussion so they are easily seen along with the text that discusses them. The separation of data and discussion serves no useful purpose in conveying your results and explanations to the reader and, in fact, makes it much more difficult to relay these conclusions.
7. Use subheadings and other means of organizing your report.
8. "Therefore" not "Therefor".
9. Put line spaces between paragraphs. Nothing makes your report more unreadable than large blocks of disjointed text with mixed usage of carriage returns. It is impossible to tell where one paragraph and idea end and another begin. If I can't read it I can't find your results, and you will do therefore poorly in conveying your ideas.
10. **There is no such thing as a one-sentence paragraph, even if it is only a sentence fragment.**
11. Long lists are not replacements for well written concise paragraphs.
12. No hanging subjects! Many write "This is because...". This **what?** (same for "These", "Those", etc).
13. Reference all figures and tables in the text in order of appearance. Otherwise the reader may assume they are useless.
14. Captions are helpful to explain what each figure or table contains. Don't assume I can tell the difference between PID and PD control just by the plot or damping ratio.
15. Too much "what" and not much "why". Explain why things happen or behave the way they do. **This explanation is what you will be paid for in future.** All "what" and no "why" indicates that you didn't understand what was happening.
16. Tone should be third person and more formal. No anecdotes or humorous asides, please. Writing style should be concise and not flowery, particularly given the 5-page limit.
17. In general, think about your layout **before** starting.

How to write a short report

Abstract: An abstract is not always necessary, depending on the context of the report. It serves to give a very brief overview of the reason the analysis was carried out, the key details of the methods, main results (with numbers), and main conclusions (interpretation of results).

Introduction

A well written report will convey information as clearly as possible so that the reader should not have to work hard to find the main outcomes and conclusions. An introduction will include background information pertinent to the subject being discussed. This could be previous research (carried out by you or others), or background concepts important to understanding your results as a whole. Be careful not to include details that should be in the methods. An introduction should include a short statement of what the report is about and why.

Methods

The purpose of the methods section is to describe what you did in enough detail that it can be repeated by someone else. This will typically include any models being used (and sometimes a derivation if required – depends on the intended audience), laboratory set up, a description of any data being used (if applicable - e.g. in parameter ID situations you are using existing data), what analyses or processes were carried out to generate your results (include key details/settings/numbers etc). Keep in mind your intended audience and their level of familiarity with your work when giving details as to lab set up. Equations should be numbered, and all parameters/terms briefly described and values given as appropriate. Don't reference an equation before it appears in your report.

Results

The results section presents the key aspects of what your analysis/experiment showed, with little interpretation or implications (save that for your discussion). Your results will drive your report. Figures and tables are key in presenting your results, and your results section and discussion will be structured around them. Table captions are placed above the table, and figure captions below the figure. Refer to figures/tables in text by their number, not by their placement on the page (e.g. above/below/right/left). Figures/tables and their captions should be able to be understood at a basic level independent of the text around them (i.e. the reader shouldn't have to go digging to work out what you are plotting against what and with what method). Use capitals when referring to Figure X or Table Y.

Figures should be clear and easy to read (not fuzzy, no miniscule text). Include all axes labels and units. If possible, plot several things on the same plot to show comparisons. If printing in black and white make sure the line styles are sufficiently different to differentiate data. Include legends. Separate plots in the same figure should be labelled a), b), c) etc, and referred to in the caption.

If presenting data in tables, think carefully about how many significant figures and/or decimal places should be used. If presenting data distributions include the mean and standard deviation, or median and inter quartile range, as appropriate. Use lines and shading to make your table easy to read.

Discussion

The discussion tells your reader what your results mean, why they are important, and how much they can be trusted. Your discussion will interpret your results, and may also include a discussion of the limitations of your methods or data or a comparison to other data in literature. You may also justify why you used a certain method here, or compare results from different methods. Depending on the context of your report, your discussion may be merged with the results section.

Conclusions

This section is important for briefly communicating the key results and main interpretation/implications/significance. Often your reader will look at the figures/tables and conclusions first to discern the main outcomes of your report and why they are important, before reading the details of methods and discussion. Don't include any new information (methods/results/discussion) in your conclusion.