

ECE4703 Project Code and Laboratory Report Guidelines

Documenting and communicating your work to others is an essential part of the development process and is something that all engineers must master. In ECE4703, the laboratory report is a tool for you to capture the work you did on the assignment and to communicate this work to the Instructor and Teaching Assistant. A good laboratory report will remain useful long after the exercise, even the course, has completed. This section of the assignment lays out the general guidelines for laboratory reports and project code submissions in ECE4703.

1 Report Guidelines

All laboratory reports in ECE4703 should follow the following format:

1. One **Cover Page** including the course number, the date, a title, and the report authors.
2. A concise **Introduction** including the problem description as well as goals and specifications. Do not just copy and paste the problem description from the assignment. Use your own words and try to motivate the reader into reading the rest of the report. You may want to even conclude the introduction section with a highlight from your solution and/or results.
3. **Background**. This section should include a concise discussion of any background information (especially theory) that is necessary to understand the methods, solution, and/or results. You can assume that the reader has a junior-level ECE education in the sense that you don't need to explain every little detail, e.g. Fourier analysis. You should, however, highlight any special theory or background material that will help the reader to better understand your work.
4. **Methods**. This section should include information about how you developed and tested your solution to the problem. Any tradeoffs that were considered should be discussed here. Any special techniques that were critical to the solution should be discussed here. This shouldn't be written as a chronological diary of your work but, rather, as a logical justification of how you came to your final solution.
5. **Problem Solution**. This section presents the specifics of your final solution. Your solution should be presented at two levels: first an overview and then the details. The overview is necessary to provide context to the reader. The overview should contain high-level flow charts and/or state diagrams to allow the reader to get an overall understanding of your solution. From this overview, you can then document the details of each specific part of your overall solution. You are encouraged to use diagrams liberally to illustrate details of your design. You don't have to justify your choices here — that was already done in the methods section.
6. **Results**. This is where you present your results as well as answers to any specific questions in the assignment. You are encouraged to try out more than the minimum asked in the

lab assignment. Always explain the precise conditions of each test, discuss what the results mean, and provide at least some intuition as to why they make sense. Results without explanation have little value. Where possible, refer to the theory in your background section (or cite a textbook) to justify your results. Use the appropriate technique to most effectively communicate your results: sometimes tables are the best way but it may also be appropriate to include plots generated in Code Composer Studio and/or screenshots from the oscilloscope.

7. **Conclusions.** In this section, you should summarize your accomplishments, document any lessons learned and any insight gained, highlight any particular struggles you had in developing the solution, and even suggest directions for future research and/or development. Did you uncover any errors in the problem description? If so what did you do about them? If you were allowed different constraints in the laboratory could you have designed a better, faster, or cheaper system? If so, how?
8. **Appendices** (not always required). Appendices are a good place to put things that help to document your work but don't contribute to the overall flow and readability of the report. If you collected a lot of data and it fills a table that takes up 3 pages, it's probably better to just discuss a summary of the results in the Results section and refer to the table in the appendix.
9. **References.** You should document the reference sources you used. That way, if you ever need to find the information again, you'll know where to go. Web references are ok but are less preferable to printed references, e.g. textbook or published papers.
10. **Code.** Do not put full code listings in your report. It is ok to put code snippets in your report to illustrate important details of your methods or solution. The full projects, however, will be compressed into a .zip file and submitted electronically with your report as described below.

You should use 1.5 line spacing for your report to allow for written comments from the grader. Break large sections into smaller subsections (and even subsubsections) as necessary to improve readability. Your grade is not based on the length of the report; a concise, clearly written report with the key results is much better than a long, wordy, confusing report.

Your report should be of professional quality and, in addition to being a pleasure to read, should look nice. All figures must be numbered, have a descriptive caption, and referenced in the text. All tables must be numbered, have a descriptive caption, and referenced in the text. Good visualizations are important. Sloppy diagrams, plots with missing axis labels, plots with axis dimensions that don't make sense, and plots that fail to show the important features of the results will receive little or no credit. And finally, don't plagiarize.

2 Project Code Guidelines

All of your code will also be read and graded on its readability. Commenting your code is a good practice even if you are the only one who will ever see it, and it is critical when you are working in teams. It is very important that you liberally comment any C, ASM, and Matlab code that you submit to the Teaching Assistant and Instructor. It is recommended that you place a header comment on the first few lines of any code that you write. The header should contain the course number, the date, the authors' names, and at least one sentence describing what the code does.

Feel free to add more to your header (you could describe the function and permissible range of certain parameters, for example) as appropriate.

The Teaching Assistant and/or the Instructor will also test your CCS projects and Matlab code to be sure that they build and that they function correctly. It is **your responsibility** to ensure that your projects build without errors on another computer (you may want to try it first before submitting your work to the Teaching Assistant and the Instructor). To help ensure that the Instructor and Teaching Assistant can successfully build and run your code, it is recommended that you use the following conventions:

1. Your projects should live on the M: drive, in the subdirectory `M:\ECE4703\labN\partM\` where $N=1,2,\dots,6$, depending on which lab assignment you are submitting, and M is the part of the project ($M=1,2,3$ in lab1). This policy should help to avoid accidental overwriting of other projects. It also avoids keeping your code on the local machine which might create temptations for others to see what you have done.
2. If you have any Matlab code to submit with your projects for lab, please make another subdirectory `M:\ECE4703\labN\matlab\` and place your Matlab code there. Please also provide a `readme.txt` file to explain the functions of the Matlab files.
3. Your report and any supporting data can be put in the `M:\ECE4703\labN\report\` directory.
4. **Critical:** Refer to all common libraries and header files in their usual locations on the C: drive. Do not move these libraries to different locations because your code will probably not build on a different computer, which means it won't be graded.
5. Compress the whole "labN" subdirectory (code and report) into one .zip file and follow the instructions below to submit it for grading.

3 WPI Filedrop

Your labN .zip file should be submitted to the Teaching Assistant and Instructor via WPI's file drop

<http://www.wpi.edu/Academics/CCC/Services/Email/filedrop.html>

prior to the deadline stated on the laboratory assignment. When you post the file drop, it is convenient to put the Instructor and Teaching Assistant's email addresses in the notify field. If you've followed the instructions above, the the Instructor and/or Teaching Assistant should be able to decompress the .zip file in their `M:\ECE4703\` directory, the projects will end up in the same path that you used.