Guide to Writing ECE 410 Lab Reports

Document Contents

Introduction
Common Report Elements
Brief Reports
Full Reports
Things to Avoid

Introduction

For each lab assignment, students are required to turn in a lab report that will be graded by a TA and combined with your *check off* score to assign a grade for each lab. Some labs will use a ***Full Report*** format and others will only require a ***Brief Report***, as indicated within each lab assignment document. This guide describes both report formats.

Common Report Elements

Purpose of Reports

The primary purpose of the lab reports is to allow student work to be evaluated so a grade can be assigned. The secondary purpose of the report is to provide technical writing experience that will be very valuable to most engineering jobs. As such, your reports should be *well organized, neat, and representative of the professionals you will soon be*. By using both Full and Brief report formats, students should gain some valuable exposure to technical writing while still allowing labs to focus on skills associated with VLSI design.

Content

The lab assignment document lists deliverables for each lab and specifies what must be included in the report. Deliverables often include schematics, layouts, simulations, etc. from the Cadence EDA tools that must be embedded or appended to the report as described below. Many labs assignments also contain Discussion Topics which should be answered within a designated section of the report.

Cover/Grading Sheet

All lab assignments will have an associated Grading Sheet which should be printed (before check off) and included as the cover sheet to your report. Check-off and report grades will be recorded on this sheet.

Format

Text: Lab reports should be type-written in a standard professional 12pt font (Time Roman, Arial, etc.). Text should be written in paragraphs, using either a blank line or indentation for separation. Page numbers or other header/footer text may be useful but are not required. You may use either single- or double-spaced text.

Figures: Figures from Cadence should be embedded or attached to illustrate the significant results (schematics, layouts, simulations) of the assignment as specified within the Deliverables of each lab. All figures must include a figure descriptive caption below the figure (e.g., "Figure 1: Schematic of a CMOS NAND gate."). For Full Reports, figures should be appropriately

cropped and embedded in the report document with type-written captions. For Brief Reports, figures can be printed individually and stapled to the report, and captions can be hand-written on the printouts.

Additional labeling of figures, such as adding notations or highlighting important characteristics may be done by hand but should be done neatly. Examples of useful notations include defining signal names on simulations plots and circling important points/transistors in plots/schematics.

Brief Reports

Report Sections

Cover Sheet

Include the Grading Sheet with your check off grade as a report cover sheet.

The following sections should be type-written within the body of the report. Include clearly highlighted heading to match the section names.

Title

Include the following information centered at the top of the first page of your lab report.

ECE 410 Lab *X* Report
Your Name
Due Date

Lab Overview

Summarize, in your own words, what you did in this lab. Be specific (e.g., "… created the schematic of a CMOS NAND gate…") but concise. [1 paragraph]

List of Figures

Include a list of attached figures, in the order they are attached, using the same caption that appears below the figure.

Discussion Topics

Provide a concise but complete answer/response to the Discussion Topics from the lab assignment. If possible, copy the question/topic before your response.

Time Required

Include an estimate of the time you spent working on the lab assignment, rounded to the nearest ½ hour. These values will be recorded and used to adjust and balance the continually evolving labs.

Feedback

This is an *optional* section in which you can include any comments about the lab. We read these carefully and use your comments to improve the lab experience. Both criticisms and complements are helpful. Your grade will not be affected by your comments in this section.

Following the body of the report, attached the required figures in the order listed within your report. Include a descriptive caption on each figure.

Figures

To minimize effort in preparing reports, it is recommended that you print the required figures directly from Cadence and append them to your report as described above. However, if you prefer, you can capture the images to files and embed them within your document. If you do, simply include each figure within the List of Figures section, with a caption under each figure.

Full Reports

Full Reports will be similar to Brief Reports with a more thorough description of the work completed and analysis of results obtained. The reports should demonstrate a professional effort to document your work.

Report Sections

Cover Sheet

Include the Grading Sheet with your check off grade as a report cover sheet.

The following sections should be type-written within the body of the report. Include clearly highlighted heading to match the section names.

Title

Include the following information centered at the top of the first page of your lab report.

ECE 410 Lab *X* Report
Your Name
Due Date

Lab Overview

Summarize, in your own words, the purpose of this lab and what you accomplished. Be concise but more detailed than in Brief Reports. Highlight important results. [1/2-1 page]

Design and Results

Briefly describe each major step of the assignment and show appropriate results of each step. Include figures from Cadence and tables of data when appropriate. Divide into subsections if necessary. [2-6 pages]

Summary of Experience

Comment on your experience in this assignment. What did you learn from your efforts? Any particular results/discoveries that were interesting or confusing? Did you achieve the learning objectives? [1/4-1/2 page]

Discussion Topics

Provide a concise but complete answer/response to the Discussion Topics from the lab assignment. If possible, copy the question/topic before your response.

Time Required

Include an estimate of the time you spent working on the lab assignment, rounded to the nearest ½ hour.

Feedback

This is an *optional* section in which you can include any comments about the lab. List things that were good or bad about this assignment, things that were unclear or helpful, and issues you would like the instructor/TA to address. Constructive comments are critical for continued improvement of the lab. Your grade will not be affected by your comments in this section. [1/4-1/2 page]

Figures

Unlike Brief Reports, figures for Full Reports should be embedded within the body of the report. If you wish to include hand-drawn sketches, calculations, etc., these may be attached at the end but should be clearly labeled with a figure/table caption. ***All figures and tables should be referred to within the text of your report*** (e.g., "as shown in Figure 2"), and descriptive captions must be included on each figure. You should never insert a figure without describing it within the text, and whenever possible, the figure should come after it appears in the text.

Try not to leave large blank spaces on a page. If the next figure won't fit, put it on the next page but continue with your text. Figure images should be cropped to exclude unnecessary user-interface or operating system graphics. Keep figure sizes reasonable: small figures should not take an entire page; large figures should not be so small that important detail cannot be seen.

Things to Avoid

Report Issues

1. Do not submit simulation plots containing overlapping waveforms. Make sure each input/output in the plot can be read separately.
2. Do not submit figures that are (a) too faded, (b) too pixilated, or (c) lack the color/contrast to be read correctly and clearly.
3. Avoid leaving any section blank. If you have no feedback, indicate this in the report. E.g., write "No feedback" in the Feedback section.
4. Do not use text or figures from tutorials/lecture notes without appropriate reference. Using figures or text from another source without proper reference is plagiarism.
5. In a Full Report, do not include figures showing simulation results without explaining them. Describe each waveform in the plot and comment on the correctness of your results. Simulations without explanation will be ignored in grading your report.

Writing Issues

1. Write in full sentences. Do not use sentence fragments. Avoid run on sentences.
2. Always check your spelling. With modern spellcheckers, there is no excuse for misspelled words.
3. Avoid slang and "unprofessional" phrases.
4. Avoid using first person (I, we, etc.). Most sentences can be rewritten to remove first-person usage. E.g., rather than saying "I added a transistor to fix the problem." say "A transistor was added to fix the problem."
5. Avoid contractions like can't, don't, won't. Rather, use cannot, do not, will not.
6. Always include units if any result values listed. Be consistent with your use of units. E.g., do not write 'ns' somewhere and 'nanoseconds' other places.