Digital Logic Lab Report Guidelines

Formal Reports

First Page

- Each lab report must include, on the first page:
  - Course number and/or title (ex. "ECCS 1721" or "Digital Logic")
  - Lab number (ex. "Lab 01")
    - You may choose whether to use leading zeroes, but note that it may be easier to organize your files if you do
  - Optionally, lab title (ex. "Introduction")
    - You will not be docked points if the title is slightly different
  - Names of all lab group members
  - Date that the lab was conducted
- You may choose to place this information on a dedicated title page, but you will not be docked points if you do not.

Sections

- You must include each of the following sections (for those with multiple titles, you may choose one).
  - The only exception to this rule is that you may merge the results and discussion sections.

Introduction or Objective

- Discuss, in your own words, what we are doing in the lab and why. This should be a clear, high-level description of the lab.

Procedure

- Discuss the steps performed and work done in the lab, including but not limited to:
  - A short summary of any VHDL descriptions you downloaded, imported, wrote, or edited, and a list or (git) diff of what changes you made.
  - If you performed simulation, synthesis, or implementation in Vivado
  - Any calculations or analytical work performed
    - You may include scanned hand-work as an appendix and reference it in the procedure.
  - Any relevant figures
- The preferred format for the procedure is a numbered list, with foreword and afterword if needed. You may also write it in paragraph form if it is easier for you.
- You may subdivide the procedure into parts or stages if desired, particularly in cases where the lab has multiple discrete parts.

Results or Data

- Include all results achieved and data collected during the lab, which may include:
  - Screenshots of elaborated design
  - Statistics of LUTs and FFs reported by Vivado for synthesis and/or implementation (this can be a screenshot/figure)
  - Tables of data
    - ex. simulation inputs and outputs
  - Pictures of the FPGA development board in action
    - ex. LEDs lit up when switches are in a certain configuration

Discussion or Analysis

- Discuss, comment on, and reference the tables and/or figures placed in the Results or Data section (or in this section, should you choose to merge the two).
- Explain and interpret what the results mean in the context of the hardware, and why they are meaningful.
- If applicable, point out any trends or patterns in the data. Use the data to draw conclusions.

Conclusion or Summary

- Discuss your thoughts on the lab/project.
- Questions to consider (you do not need to include all of these):
  - What went right, and what went wrong?
  - If you did the lab again, what would you do differently?
  - Did you make any mistakes during the lab, and did they affect your data?
  - Did the lab connect to or expand upon what you learned in the lecture?
  - Could anything be done to improve the lab (or labs in general) in the future?
  - Did you find the lab useful?
  - Did you enjoy the lab?

Attachments or Appendices

- Attachments or appendices may vary between labs. For many labs they may be unnecessary.
- Each attachments or appendix should begin on a new page with an appropriate title and/or subtitle.
  - For example: "Attachment 1 – Hand Work from Procedure Step X" or "Appendix A – Full VHDL Code for Y Hardware"
- If included, each attachment or appendix should be referenced in the main body of your report.

Formatting

- You are not required to use any particular font, but it must be legible and at least 11 pt size. You are encouraged to use a larger font for the title and section headers.
- See Procedure for additional guidelines on the procedure formatting.

Figures

- Number, label, and caption all figures, tables, and code snippets. Captions for figures and code snippets should be placed below, and those for tables should be placed above.
  - For example: "Figure 1: Block diagram for shift register."
  - Code snippets longer than one page should be placed at the end as an appendix, and referenced appropriately.
  - You may reference code snippets as "Snippet X", "Code X", or "Figure X".
  - You may choose to include code snippets as a screenshot or as copy-pasted text.
- Reference figures, tables, and code snippets by their number. Again, you may reference code snippets as "Snippet", "Code", or "Figure".
- Figures, code snippets, and/or tables without textual description are not sufficient. You must discuss, with at least one sentence, each of these items.

Suggestions

- You may write your reports however you choose, but you may find it significantly easier to handle a large number of figures using LaTeX.
  - Using the online platform Overleaf, you can share LaTeX documents with one person (lab partner) for free.
    - If you have more than two people in your group, one person should be able to acquire Overleaf premium via IEEE Collaboratec as a student at ONU.
- Markdown is also a useful tool (most lab handouts and worksheets are written in this).
  - You may find it difficult to share Markdown files directly if you are not proficient with Git. However, Notion is a good option for collaboration with good Markdown support.

Writing

- You may use "we" when describing actions that you and your partner, or the group, directly performed during the lab. Take ownership of *your* work.
  - For instance, "the hardware we tested..." or "we held a group discussion about..."
- Avoid adding bloat to your lab report. This is not an essay, and you do not need to meet a minimum word count. However, your responses should be *complete* and *efficient*. You should seek to express the most detail with only as many words as needed.
  - Making your graders' lives easier will likely earn you better grades. Alternatively put, make it easy to find what we are looking for.

Originality

- You and your lab partner(s) will collaborate to complete each lab report, unless otherwise instructed.
- You are not allowed to write another lab group's report, or to have another group write your own.
- You may not use another group's results without permission and advance knowledge from the instructor and that group.
- At times, you may collaborate with another group, or in the case of absences, join another group, for a particular lab. In this case, that new group becomes your "group" for that lab in the context of originality considerations.
- You may paraphrase, but not directly copy, the lab handout or instructions, with the exception of individual steps of the procedure. However, you should expand upon the procedure in more detail, as needed.

AI Usage

- Do not use AI (e.g., ChatGPT) to write your entire report. If you do this with zero effort, it will be considered plagiarism.
- **However,** you may use AI to *help* (that means, do not just copy-paste exactly what it spits out) with sections of your report (particularly the introduction and conclusion). If you use ChatGPT or similar tools, you **must** disclose the relevant prompts and responses, attached as screenshots in an appendix to the end of your report. Any AI usage that does not follow these rules will be considered plagiarism.
- You are not required to disclose the usage of tools that may utilize AI solely for grammar detection and correction *without synthesizing new material for you,* such as the core features of Grammarly.

Informal Reports

- Informal reports may vary in their formatting.
- You must still include, at a minimum, the names of your lab group members.
- In general, you will not have to write an introduction, procedure, or conclusion for informal reports, unless instructed. You generally must include results, and typically will discuss them briefly.
- You are not required to adhere to the formatting guidelines, except the minimum font size. Your report must still be legible.
- You may choose to use some or all of the same sections from the formal report. You may also use your own section names in informal reports. While not required, in most cases, you should still use some section headings.
- **All lab reports including informal reports are still subject to the originality rules.**