Lab Report Guidelines

There will be three lab reports for the semester. Each group turns in one report for each set of labs. The main purpose for the report is to communicate the results to others and to enable them to duplicate the work in a straightforward manner.

All lab reports must be typed and submitted online (Blackboard). In each report, you will explain the theory behind the modules you built, explain how you tested their functionality, and answer some questions about what you learned. You have to include screenshots of all schematics, code, test bench waveforms, and VHDL test bench code. The report is not a list of what you did in the lab, but rather a summary of your objectives and achievements.

You should follow the guidelines listed below as you write the lab report. In addition, each lab will have specific deliverables, namely screenshots and discussion questions. These will be released for each lab report, along with the report due dates.

The reports will be evaluated on their technical accuracy as well as on the quality of writing. This includes overall organization, presentation of graphics and tables, grammar and wording, and overall clarity of writing. Rubrics for both technical content as well as writing quality can be found on the ESE171 website.

General Report Notes

1. The report should be continuous prose, not a bullet/numbered list.
2. You should include everything listed in the outline below.
3. Emphasize what you learned from the lab exercises as opposed to simply listing what you did.
4. Do not copy theoretical module explanations from the lab write-up. Instead, paraphrase the lab write-up and augment it with your own understanding from doing the lab.
5. All screenshots should be cropped to remove any extraneous portions, and should be readable. You should add labels (e.g. for inputs and outputs) to your schematic to make it more understandable if necessary.
**Report Outline and Content**

0. **Title Block**
   a. Can be a cover page or a block on the top of the first page
   b. Names of all team members
   c. Date
   d. Lab number and title

1. **Introduction (5pts)**
   a. What did you do?
   b. Goals of the lab

2. **Theory of Operation (30pts)**
   Explain the theory of each of the modules you built for this lab:
   a. Give a description of what each module does
   b. Explain how each module works
   c. Explain how the modules connect and interact with each other
   d. Make a new subsection for each module
   e. **Schematic/code for all modules**
      i. Brief (1-2 sentence) description of how module relates to theory of operation
      ii. Make sure inputs and outputs are clearly labeled and readable!

3. **Experimental Results (30pts)**
   Simulations
   i. Show waveforms or VHDL test bench code for all modules
   ii. You don’t need simulations for simple wrappers or top-level modules
   iii. Provide a table showing your input cases and the corresponding outputs
   iv. Justify why your test cases are sufficient to prove module functionality
   v. Explain why your simulation shows that the module is correct

4. **Discussion and Conclusion (25pts)**
   a. This is an integral part of the report
   b. Answers to discussion questions (provided for each report)
   c. Talk about what you learned

5. **Distribution of Labor and Signatures**
   a. Say what each team member did for the lab and the report
   b. Electronically sign the report attesting that you completed the lab and report as a group
      and that you agree to the distribution of labor
6. **Writing Component (10pts)**
   a. *See full writing rubric below*
   b. Organization (3pts)
   c. Wording, grammar and mechanics (3pts)
   d. Graphic elements (schematics, waveforms, tables), including captions (2pts)
   e. Overall writing style (2pts)

   Writing style facilitates the sharing of information while at the same time maintaining a professional tone. The reader doesn’t have to work to understand the report or to ‘make meaning happen.’
# Writing Component Rubric

<table>
<thead>
<tr>
<th>Organization</th>
<th>2/3 Points</th>
<th>1/2 Points</th>
<th>0 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report conveys the appropriate information in a way that facilitates reading.</td>
<td>The text has basic headings, but subheadings would help clarify organization and are not present. Paragraphs are organized, but the reader has to figure out the organization.</td>
<td>The text lacks headings or subheadings. Paragraphs appear to contain random facts and ideas with no clear connection. The reader is misled regarding the topic, thinking minor points are major ones.</td>
<td></td>
</tr>
<tr>
<td>Headings and subheadings help the reader navigate the report. Organization is clear within paragraphs. Links between paragraphs and sentences are clear. It is clear which points are the main ones and which support the main points.</td>
<td>Overuse of ‘we’ distracts the reader from the process or subject of the report. Overuse of passive creates confusion and tires the reader. Phrasing is wordy rather than concise. Wording is vague when specific numbers or results could be given. Punctuation is sometimes confusing.</td>
<td>Poor grammar and wording create an incomprehensible report.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grammar, wording, mechanics</th>
<th>2/3 Points</th>
<th>1/2 Points</th>
<th>0 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammar conforms to norms for academic/technical writing. Wording is concise and specific. Mechanics (commas, periods, capital letters, etc.) aid comprehension.</td>
<td>Tables, figures and equations are not numbered, format is unprofessional, or numbering is inconsistent. Reference to these graphics is awkward or confusing (‘the figure below,’ ‘the first equation’). The connection to the discussion is not made explicit. Graphics are taken from other sources, but the source is not acknowledged. It is hard to distinguish the measured and calculated values on the graphs (if appropriate). The axes are not well labeled or don’t give units.</td>
<td>Graphics include irrelevant or confusing detail, are illegible, lack a legend. Graphics bear little or no relation to what is discussed in the text, or even contradict the text.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graphic elements (tables, charts, equations, etc.)</th>
<th>2/3 Points</th>
<th>1/2 Points</th>
<th>0 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables, figures and equations are numbered. Format (headings, descriptive captions, legends, layout of equations) is easily readable and conforms to norms. The text refers to each table, figure or equation and discusses or explains as appropriate. Tables and figures are easy to read, contain no extraneous detail, and support information in the text. Sources are noted as needed. Graphs shows difference between measured and calculated (simulated) values (where appropriate). Axes are clearly labeled including units.</td>
<td>Tables, figures and equations are not numbered, format is unprofessional, or numbering is inconsistent. Reference to these graphics is awkward or confusing (‘the figure below,’ ‘the first equation’). The connection to the discussion is not made explicit. Graphics are taken from other sources, but the source is not acknowledged. It is hard to distinguish the measured and calculated values on the graphs (if appropriate). The axes are not well labeled or don’t give units.</td>
<td>Graphics include irrelevant or confusing detail, are illegible, lack a legend. Graphics bear little or no relation to what is discussed in the text, or even contradict the text.</td>
<td></td>
</tr>
</tbody>
</table>