BYU IDAHO | Department of Computer Science & Electrical Engineering

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ECEN 340 Laboratory Report Format

A formal lab report, worth 50 points, must be turned in for each experiment. Lab reports must be written on a computer and submitted electronically.

The purpose of a scientific or engineering lab report is to accurately convey the details and results of an experiment to someone who may need to repeat the experiment in order to verify your results. In this course, your experiments will be designing digital hardware systems with the Verilog Hardware Description Language. Your laboratory report must include the following:

1. The operational specifications of the system.
2. The Verilog code that describes the structure and/or behavior of the system.
3. The method(s) you used to verify the "logical correctness" (simulation) of your design.
4. The method(s) you used to test the operation of your actual hardware implementation and verify that it meets the specifications.

Each lab report must have seven sections, with no more than one section on a page. This is the format for lab reports:

Cover Sheet (worth 2 points). This is the first page and will contain:

1. Name & number of the lab exercise.
2. Your full name.
3. Course and section number.

Introduction (worth 10 points). This will have three parts (label them):

1. **Background:** What is the overall purpose of the system?
2. **Specifications**: What are the detailed operational specifications of the system?
3. **Equipment**: What hardware, software, and other materials were used to implement the system?

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Software Implementation (Verilog Source Code) (worth 10 points).

This describes the structure and/or behavior of the system.

Design Verification (Simulation Waveforms) (worth 5 points).

Include a screen shot and explanation of your simulation results.

Hardware Implementation (UCF File) (worth 5 points).

The UCF shows the connection of module ports, system clocks, etc. to FPGA pins on the Basys2 board.

Hardware Verification (Functional Test of Programmed FPGA) (worth 5 points).

Show how you tested the programmed hardware to verify correct functionality.

Discussion & Conclusions (worth 10 points).

Explain the basic principles that were learned or reinforced during the laboratory experiment. Do not simply say, "Everything went smoothly, and I learned a lot." Remember, it is not a summary, it is a discussion of what you *concluded* after completing the system design and implementation! You will probably use words like, "This demonstrates . . .", "This means . . .", "This is because . . .", etc.

Address the following questions in your discussion/conclusion:

1. How well did your system satisfy the specifications?
2. What design/coding/implementation errors were encountered? How were they eliminated or minimized?
3. What are some applications for this Verilog code or digital system?
4. What are the advantages and disadvantages of this system implementation compared to others you have used?

Although you may work with a partner on your system design, and therefore have the same code, UCF, and verification results, your conclusions must be uniquely yours. You may not write a joint Discussion & Conclusions section.

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Other (3 points)

In addition to the points listed for each section, points are given for neatness and professional-quality language and spelling. Remember, this is not an informal paper; it is a professional-quality document.
