PROJECT GUIDELINES

INTRODUCTION

Now that we have experienced designing hardware using VHDL, from discrete components to special-purpose hardware to a general-purpose processor, the WC16, we are ready to do the term project. We have covered design concepts including state machines, data paths, design with timing diagrams, interfacing with external peripherals, working with memory and designing a processor, all of which you have completed hands-on labs to gain experience over the past 2 ½ months to give you the tools necessary to design computer hardware. This project involves designing, developing, implementing, and documenting a hardware device that accomplishes a meaningful objective. The only requirement is that your group uses an external device of some kind, such as the VGA screen or other device, unless I have approved otherwise. Each group of 4 (four) should consist of individuals who have similar schedules and project interests. Each group will present their device during the final exam period, Tuesday, December 14th, 7:00 pm – 10:00 pm. Each presentation and demonstration combined must be **no more** than 15 minutes. This project is worth 30% of your class grade. Although you will most likely use the boards that we have used in class this term, you may also use other breadboards or other prototype boards if you'd like.

PROJECT DETAILS AND TIMING

- Group Members – This is a list of three people who you would like to be in a group with (in preferential order) – November 11, 2021.

- Project Proposal – This is a brief, informal description (usually between ½ and 1 page in length) that briefly describes what your group will design. These are not formal specifications; these are only guidelines that will help me to help you. With this, I will be able to get a general idea about what you are doing and make suggestions if the idea should be scaled up, scaled down, or changed in some way. Your project *will not* be graded against what you say you will do in this proposal. Due: Wednesday, November 17 – upload to Moodle assignment. **Each group must make an appointment with Mike, Andrew, or Nathan by Wednesday, November 17th at the latest.**

- Project Demonstration and PowerPoint Presentation – Put your entire project directory and PowerPoint presentation on a new directory on your laptop. *The project must be implemented as a "turn key" system on your board so that your board loads it upon power-up (follow the instructions given in the appendix in your book).* Your PowerPoint presentation must contain a picture of everyone in the group.

- Project Report – This is a formal report for your project. This report must include an abstract, table of contents, and VHDL code. You must clearly describe your project, obstacles, how you solved problems, and how your project works. You must include appropriate simulations. These should be described and referenced. The VHDL code for

important components must be included as Appendices at the end of the report. Place a Memory Stick with your project directory, including PowerPoint and Report files, secured in a pocket with your report.

- Project Video – Each group must create a video demonstrating their project. Be as creative as you would like to be!

- Peer Review Forms – These reviews **MUST BE FILLED OUT PROPERLY AND GIVEN TO ME IN A SEALED ENVELOPE, INDIVIDUALLY.** If I don't have all of the properly filled out peer review forms, all members of the group will receive an INCOMPLETE in the course until I get them. These forms may be downloaded on the class web site.

    - Part of your grade will depend on you filling out meaningful responses on the evaluations and turning them in to me in a sealed envelope before the presentation day.

PROJECT DELIVERABLES

Turn in the following items ***before*** the presentation date

- Peer Review Forms
- Upload Project Report, Project Source Code, and Project Video to Moodle

Turn in the following items ***on*** the presentation date

- Project Report
- Project Video