Introduction

Being able to effectively communicate design details and the design thought process is an important skill for all engineers. The purpose of these lab reports is to help the student learn and focus effective communicating skills, to ascertain the students understanding of the material and critical thinking capabilities, and to help the student consider different design approaches. A lab report will be required for each project. The lab grade is determined from the following:

Lab 1: 20 points
Lab 2: 20 points
Lab 3: 20 points
Lab 4: 40 points
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Total: 100 points

There are many dynamics that will be factored into each project report. Below is a description of the points awarded for each of those dynamics. For project 4 all points are doubled.

<table>
<thead>
<tr>
<th>Project Questions:</th>
<th>6 points total (30%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoroughness of Report and Completion of Project:</td>
<td>10 points (50%)</td>
</tr>
<tr>
<td>Documented Code or Neat Wiring:</td>
<td>3 points (15%)</td>
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<tr>
<td>Individual Contributions, Punctuality, Making Use of Time:</td>
<td>1 point (5%)</td>
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</tbody>
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Project Questions

Project questions are meant to help the student identify other design possibilities, the positive and negative aspects of those design possibilities, and to determine the students understanding of the theory used in the project. There is no right or wrong answers but all answers should be thorough, well thought out, and well documented. If a student can not determine a plausible answer to a question the course text book or Internet may be able to helpful.

Report Format

The points for the body of the report are determined subjectively by the lab TA. Professional grammar, correct spelling and cohesiveness are important factors. The following sections should be included in all reports.

*Introduction* – this section specifies the goals of the project and a short description of the outcome.
Implementation – this section specifies how the student achieved the goals specified in the introduction. It should include any pertinent background information for each topic discussed. For instance it may be important to include mathematical or logic based formulas for some aspects of the project.

Testing – this section specifies the methods that were used to determine the correctness and effectiveness of the design.

Results – this section should include the results of the testing. A description of what happened or screen shots can be used. Conclusion of the results should not be added to this section.

Discussion – place the answers to each projects’ questions in this section.

Conclusion – this section is used for the following: what was learned from the results, the effectiveness of the design used, what was learned from not only the technological but also about the strife encountered, and what should be done differently.

Code Documentation and Wiring

The nature of the project will determine whether code or wiring is graded. Being proficient at aspects is important for professionalism, grading, and debugging. For all software developed there needs to be a header. The generic form of this header is shown below:

;Name: NameOfProgram
;Authors: LastName1, FirstName1. LastName2, FirstName2.
;Date Finished: MM/DD/YYYY
;Description: A general description of what is accomplished.

When documenting the code, prudence should be exhibited. Not every line of code needs to be documented. Instead, blocks of code should be described in detail. Then any piece of code that is not inherently obvious to its function should be documented. The difference between a poor description and detailed description of code is illustrated below:

Poor Description
;The following code adds together the numbers of the array

Detailed Description
;The following 7 lines of code add together the array elements
;of TestResults. The DX register is used to iterate through the
;array, while the AX register stores the sum. The numerical
;result is transferred to the variable TestResultsSum

Wiring should be tight and logical. Different colored wiring for different aspects of the circuit such as power, ground, address bus, data bus, etc. should be used to aid clarity. Boards in the past generally work better when extra care is taken when wiring. Good wiring techniques help alleviates shorts, and allow for easy identification of circuit bugs.