ELEC 3040/3050 Midterm Design Report Guidelines

The midterm design report is to discuss at least one element of the semester design project from week 5 (keypad), week 7 (PWM generator), or week 8 (motor drive). In this report, students are expected to demonstrate the following ELEC/ECPE student outcomes (with the exception of oral communication).

1. *Graduates of the ELEC/ECPE program will have the ability to design an electrical component or system, including hardware and software elements, to meet desired needs.*
2. *Graduates of the ELEC/ECPE program will have the ability to design and conduct experiments to acquire needed data, and to analyze and interpret data to solve engineering problems.*
3. *Graduates of the ELEC/ECPE program will have proficiency in communicating ideas and information orally and in writing.*

Attainment of these outcomes (and several others) is expected to be demonstrated by all ECE majors by the time of graduation.

Report grading. The design report will be graded using rubrics and criteria for each of the three student outcomes stated above. These rubrics are posted on the course web page.

Report content. The report should include the design requirements, explanation of the design, a description of experiment(s) that were designed to acquire data related to the design, with presentation and analysis of the acquired data. The format of the report is to be as follows.

1. *Heading:* Use the same format as for weekly memos, but only name the author of the report (not all teammates).

2. *Abstract:* In less than 50 words, summarize what is being reported. Example: "This report describes the design and test of a. . . "   Possibly give one or two noteworthy outcomes. Keep the abstract short in length.

3. *Problem description*: Describe the design requirements and constraints.

4. *Description of the solution*: Describe hardware and/or software that has been created to solve the problem and meet the design requirements and constraints. Use figures, where appropriate, to help explain the solution. If you encountered any unique problems with the design, describe the problem and how it was solved. Cite sources of information (reference list at the end of the report).

5. *Experiments and experimentalal results*: Describe the experiments used to gather data. Present the data, using figures and tables as needed. Draw conclusions from the presented data.

6. *References*: Include a list of references, each item numbered [1], [2], ... or by name (year), e.g. *Nelson (2013)*. When a citation is made in the body of the report, use the number [3], or the name (*Nelson, 2013*).

7. *Appendices:* Items that are difficult to format "nicely" can go here. A program listing is one example.

Page Format. Single-space the heading. Double-space the report. Appendices, especially program code, can be single-spaced.

Tips:

1. Write in third person point of view (avoid first person unless absolutely necessary.)

2. Consider when it would be appropriate to use *active voice* ("He did this") vs. *passive voice* ("This was done"). This issue, and a number of other technical writing tips for engineers, are available in the article "Write Clearly and Concisely", on the IEEE Professional Communications Society web page: http://pcs.ieee.org/communication-resources-for-engineers/style/write-clearly-and-concisely/

3. Avoid subjective statements, e.g. "The design worked great."

4. Figures, tables, appendices: remember to provide a label and caption for each one, and place them in the order referenced. In the text of the report, refer to these items by label, e.g. "See Fig. 1 and Table A."

5. Proofread for grammar and spelling - do not rely solely on automatic checkers.

6. Ability to use and cite references is one of the outcomes measured on the rubric used to evaluate writing. **Even if you do not believe that you need to use a reference, you must still <u>find</u> one or more sources that you can cite, to demonstrate that you can properly list and cite references in a formal report.**