INSTRUCTIONS FOR THE FINAL REPORT

The *Final Report* is the archival record of the design project and its results. The report emphasizes *your original contributions to the design solution*; it should not, in other words, merely repeat known solutions and vendor information. The intended readers of the report include your mentor, peers, and any industrial sponsor familiar with the design problem and its possible solutions. Those readers expect an accurate and complete account of the design process and an appraisal of its results. Consequently, you must show that you have subjected the results to stringent tests and that the prototype is a true solution to the problem.

Each team will present this content in both a team presentation and a written report. The oral Final Report represents 10 percent of the course grade, and the written Final Report represents 35 percent of the course grade (25 percent on the basis of writing performance, and 10 person on the basis of technical content). The written report must compare in quality with professional engineering reports in conciseness, accessibility, completeness of information, and conformance to format standards and rules of language usage.

Whereas most of the formatting standards for other short project reports apply also to the final written report, ***there are major differences. Please read these specifications and examine the template carefully. The template will be posted on Canvas.***

ORAL FINAL REPORT

The oral Final Report presentation is quite formal, and teams will present to a larger audience than that for the progress reports.

There will be a 30-minute period for each presentation, including a question-and-answer period during which sponsors, faculty, staff, and audience will require that your team defend your results. The prepared content for the oral Final Report has a required length of 18–23 minutes. **Time limits will be enforced strictly.** The remainder of the 30 minutes will be devoted to a question-and-answer session. Members of the course staff will attend the presentation, and in some cases your Faculty Mentor. **You should also make an effort to include the representative(s) for any corporate sponsor**.

Each student must attend at least two Final Oral Reports other than that of his or her team.

The content for the oral Final Report should be based on the outline (below) for the written Final Report. Although the team will present some of the same material as in the written report, emphasize the results of your project, how you met your project goals, and what recommendations or conclusions you have reached by the end. Make your final presentation interesting and informative. ***Non-original material in your slides should be referenced on the slide where it is used,*** since there is no References section.

WRITTEN FINAL REPORT

The written Final Report is a formal document, not a technical memorandum like previous written assignments. As a result, there are some added elements, as well as some additional formatting requirements. As a formal document, finally, it must be submitted in hard copy to any outside stakeholder (e.g., a corporate sponsor).

Additional Elements

The document will not include a memorandum heading and will begin instead with *front matter*, which you have not provided in previous documents. Present these elements in the following order:

> **Title Page.** Include the title, TA's name, the sponsor's names and affiliations if applicable, authors' names, and date of the report, the name of the course (EE 464 Senior Design Project), name of the department (Electrical and Computer Engineering Department), and the name of the University. The Template of the Final Report on Canvas gives instructions for the layout of the title page.
>
> **Table of Contents.** Titled "Contents," this element lists the section headings and subheadings as well as the page number of each. The Template of the Final Report on Canvas gives you the format requirements for the table of contents.
>
> **Lists of Tables and List of Figures.** Present as two separate elements, titled "Tables" and "Figures," respectively. Each list includes the number, title, and page number of each table or figure.
>
> **Executive Summary.** Provide a short, *single-spaced*, section-by-section summary of the contents of the report. Write the Executive Summary under the assumption that it may be the only part of the report some readers look at. Consider it a condensed version of the report itself: as if your reader asked you to rewrite it in many fewer pages. **An executive summary is normally 5–10% of the length of the document it summarizes, and your goal is to be concise without sacrificing the most important ideas.**

Each element will begin a new page, and each element will contain a heading that is centered, in all-capitals and bold.

Additional Formatting

The formatting requirements remain the same as those for memos, save for the use of memo headings and the following:

> **Page Numbering**
> Front matter, the body of the document, and appendixes each receive their own page numbering, and each begins at the first page.
>
> For front matter (title page, table of contents, and the executive summary), use lower-case Roman numerals. For the body (Introduction through References), use Arabic numbers. For

appendixes, use a combination of the appendix letter and Arabic numerals (e.g., A-1, A-2… for Appendix A; B-1, B-2… for Appendix B).

The page number *does not* appear on the first page of the front matter and the first page of the body—although each is counted as the first page—but it *does* appear on the first page (the divider page) of each appendix. Center the page number 0.8 inch from the bottom.

Binding
One bound copy of the report must be submitted to your corporate sponsor, in addition to the required electronic submissions to Canvas and to your Mentor. Bind with a coiled-plastic binding, a *clear* (transparent) plastic front cover, and a black back cover. The title page must be visible through the clear plastic front cover. This binder is available at most print shops.

You may use the ***Template for the Final Report***, a Word file available in Canvas, which both describes the formatting and exemplifies the format and page layout requirements. The template must be followed exactly. When using the template, remove or replace all instructions, headings, and any other material in brackets and italics.

Content
The following outline describes required content and organization of the Final Report. It provides required major (first-level) headings for your document, but you should create your own appropriate subheadings, as needed, and organize each section and paragraph according to the needs of your material.

> **The team *must* include at least one calculation with at least one equation set off from the text**, with accompanying discussion. That material may be appropriate in Section 4.0 and/or Section 5.0, or it could be suitable in an appendix.

[FRONT MATTER]

1. Title Page
2. Table of Contents
3. List of Figures
4. List of Tables
5. Executive Summary

1.0 INTRODUCTION
Orient the reader to this document by including the following:

- A clear statement of the purpose and context of the document
- A clear, concise, and comprehensive summary version of the document's content (less detailed than an Executive Summary).

2.0 DESIGN PROBLEM
Summarize your project's goals, motivation, and requirements. This description should include an explicit statement of the design problem and specifications. Your team's *Problem*

Statement document from EE 364D/E is a good starting point for some of this content; however, your understanding of the design problem has likely changed and deepened since the start of the project.

3.0 DESIGN SOLUTION

Document the final design solution and delivered prototype *thoroughly* so that someone can understand and duplicate it. Sponsors tend to look for results and are appreciative of a well-documented solution, so be as thorough and detailed as you can. Include a clear, detailed description of your final design solution, making sure to explain (1) how your design reflects an effort to meet specifications, and (2) the solution's underlying theory and operating principles.

Note: Use appendixes as needed and appropriate to present parts lists, drawings, prototype construction information, and anything else that might be useful.

4.0 DESIGN IMPLEMENTATION

Explain important factors in the implementation phase that led you to this specific design solution: how you made design decisions, overcame obstacles, and made changes to your original ideas. Describe design decisions you made along the way that led to your solution and how you implemented them; a succinct discussion of alternative designs is appropriate here. An economic analysis should also be included, addressing, for instance, cost/benefit analysis. Also describe major problems you encountered along the way, and the adjustments you had to make as a result. Explain what modifications you had to make to the original design, and describe any innovations in technique, materials, or design practice that you performed during the prototype construction phase. ***If appropriate, include calculations here.***

5.0 TEST AND EVALUATION

Describe the testing and evaluation you performed to assess the success of your design. In addition to making clear your methods, present results clearly and *show your data*. Compare your results against the design specifications, being clear about where the design did and did not meet specifications. Identify where you fell short and explain why. Remember that graphical support can be helpful in presenting data. ***If appropriate, include calculations here.***

6.0 TIME AND COST CONSIDERATIONS

Describe how well the project met time and budget constraints. Describe any special problems you encountered that led to schedule or cost overruns, and your response to those problems.

7.0 SAFETY AND ETHICAL ASPECTS OF DESIGN

Assess the safety aspects of your project and how your project will address the larger ethical issues of professional engineering practice. Such issues may include danger to human life and limb, possibility of environmental damage, life-cycle or recycling issues, and warning notices required for the user. Think, too, about how you designed in an effort to foresee unintended consequences of your design.

8.0 RECOMMENDATIONS

List any recommendations for further studies or investigations that will improve the design. You can take one or both of two approaches: (1) provide recommendations on where next to take this work, or (2) explain to someone else who is undertaking an identical project how you would do things differently. Demonstrate your knowledge. At this point, you should be the expert on your solution. Do not be afraid to make recommendations not directly related to your specific solution. Give your view of the "big picture."

9.0 CONCLUSION

Your conclusion section is the culmination of your paper as well as of your entire project. Recapitulates your main achievements, findings, results, recommendations, and any limitations or shortcomings in your compliance with specifications. Use that summary to provide a frank evaluation of how well the final solution meets the project requirements and parameters, as well as any ways in which it exceeds the project requirements.

[BACK MATTER]

REFERENCES

List all references cited in the text. This course uses the IEEE reference style, outlined in the *Course Guide*. **Note that this section does not have a decimal number and that it starts on a new page as the first section of the back matter.**

APPENDIXES

Include appendixes for information that is important and useful but that would distract the reader if placed in the body. **You must include a reference to this information in the text.** Also note that appendixes in formal documents have their own page numbering (e.g., pages A-1, A-2, A-3… for Appendix A; pages B-1, B-2, B-3… for Appendix B). Appendix pages *do not* count toward meeting assignment page requirements.