

Design Reviews, Presentations, and Reports

During the spring semester you have the following deliverables for your project (the exact due dates are on the syllabus):

- Team Member Evaluations
- Progress Reports
- Mid-Semester Report
- Mid-semester Design Review
- The Final Report
- The Final Technical Presentation
- The Final Poster Presentation

This section addresses the requirements for each of these deliverables.

Team Member Evaluations

Four times throughout the semester, each person in the class is expected to evaluate all of the members of their team. The team member evaluations should be submitted via email. It is critical that you be honest and realistic in completing the evaluations. Carefully review the grading criteria associated with the different scores. ***You are not to get together as team and decide upon the ratings.***

Progress Reports

The following items should be included in the weekly progress reports:

- *Accomplishments.* Identify accomplishments since the last report and indicate the team member responsible for each.
- *Adherence to Schedule.* Indicate if you are on schedule or if there are areas in the project that are falling behind the Project Plan schedule.
- *Issues.* Indicate unresolved technical or logistical issues that have to be addressed and represent a risk to timely completion of the project.
- *Plan.* Indicate what you are planning to accomplish before the next progress report is due and who is responsible for each task.
- *Parts.* Include a “parts report” – parts needed, what you have on order and what you need to order that week, if applicable.

Mid-Semester Report

The format of the Mid-Semester Report is the same as that of the Final Report (see below). However, the Mid-Semester Report only needs to contain the following: a title

page, abstract, Sections 1-3, parts of 4 as applicable to the project, and Section 6. It should be well-written and as complete as possible so that only minor changes to these sections are necessary for the final report. Also, pay careful attention to the formatting requirements, which should be applied to both the Mid-Semester and Final reports.

Mid-Semester Design Review

In the mid-semester design review, your team will sit down with the faculty committee assigned to your project to review your progress. The length of the meeting is 30 minutes. The faculty will have had an opportunity to review your Mid-Semester report before the meeting. The team is evaluated based upon the following criteria:

- Is the team is making satisfactory progress to completion of project?
- Do all team members have an understanding of the technical issues?
- Are all team members are all capable of answering questions?
- Is the team is actually executing the project (building, constructing, executing, or testing)?
- Is the team addressing the requirements, standards, and constraints set forth for the design?
- Are all team members are actively participating in the design?

The team should organize a presentation which:

- Provides a brief overview of the project
 - Need statement
 - Engineering requirements
 - Design level 0, 1, and 2
- Status of unit implementation - provide schematics for all units
 - Complete - bring plots, video, or test data demonstrating completeness and conformity with requirements.
 - In progress (with % complete) - discuss implementation strategy.
 - Untouched - discuss anticipated implementation strategy.
- Project plan
 - Bring along Gantt chart
 - Timeline for
 - unit implementation and test
 - Integration test
 - Final acceptance test
- Identify who is responsible for each task

The Final Report

All final reports are kept in the EE senior design library and are made public for future classes to see. The format of the final report is on the following page. Please make sure to address changes that were recommended to the mid-semester report. The report is due on **Monday April 15th at noon**. Submit the following:

- Two hardcopies of the report must be submitted (one for the Senior Project Library and one for your advisor). The hardcopies must be spiral bound with a clear plastic cover.
- A CD-ROM that contains a softcopy of the report, any software developed, and videos demonstrations (if applicable).
- A softcopy of the report should be submitted via email to the faculty mentors so they can review the reports before the presentations.

Report Format

Section	Directions
Cover Page	See format below.
Table of Contents	Identify the major sections and appendices of the report, along with the corresponding page numbers.
Abstract	Provide an overview/summary of the entire report and project. (not to exceed 1 page)
1. Problem Statement	
1.1. Need Statement	Several sentences describing the need to be met.
1.2. Objective Statement	1-2 paragraphs that give an overview of the project objectives.
1.3. Background and Related Work	<p>Indicate what the current state-of-the-art in the field is regarding this particular technology. If it is a <i>new product project</i>, identify similar products that are available and what is unique about yours. If it is a <i>research project</i>, include the basic theory of what you are doing and address current status of work in this area. All references need to be properly identified at the end of the report. If this is a sponsored project, and the above are not appropriate, then you should describe the product/system. Also, include work that was done for needs identification. Examples are:</p> <ul style="list-style-type: none"> • Use-case scenarios. • Objectives trees. <p>Ranked user needs (include any pair-wise comparison tables in the appendix. Only list the final results here.</p>
2. The Requirements Specification	
2.1 The Requirements	<p>Include a 3 column table with marketing requirements, engineering requirements, and validation rationale.</p> <p>Include engineering-marketing and engineering-engineering requirements tradeoffs analysis tables.</p> <p>Include requirements benchmarks of other systems if applicable.</p>
2.2 Constraints	In this section identify the realistic constraints that apply to your project. Your capstone project must clearly address most (≥ 5) of the following 8 realistic constraints: Economic, Environmental, Sustainability, Manufacturability, Ethical, Health & Safety, Social, and Political. Use separate sub-headings to clearly delineate each element.
2.3 Standards	Identify the standards that apply to the project and how they apply.
3. Design	<ul style="list-style-type: none"> • This should reflect the final system implementation, and should contain a detailed description of the final design and its operation. Describe the behavior of the system using a combination of the following techniques:

	<p>Functional Decomposition, Flow Charts, State Diagrams, Data Flow Diagrams , Entity Relationship Diagrams, UML (different views), or any other methods of describing behavior appropriate for the problem.</p> <ul style="list-style-type: none"> • A good way to organize the design information is to provide a high-level diagram of the entire system and describe how it operates. Then provide a detailed description for each of the successive hardware/software subsystems. Build this as a hierarchy. See Chapter 5 in the Ford and Coulston textbook for more information. • Identify the alternative solutions considered and the design decisions made. The objective of this section is to describe alternatives considered. For example, this could be in terms of different system architectures or different technical options considered (e.g. different sensing methods, motor selection choices, etc.). This can be documented by brainstorming results, concept tables/fans, benchmarking tables, and decision matrices. Include narrative descriptions of the results.
4. Design Verification	
4.1 Test Results	The objective of the testing is to show that your system operates as planned and meets the requirements set forth for the project. Document the tests performed, results obtained, and discuss the significance of the results. Digital photos are a good way to document accomplishments for items that you built, and a digital camera can be signed out from MSC.
4.2 Requirements Verification	<ul style="list-style-type: none"> • For each of the engineering requirements, indicate how it was met. Provide references to supporting data that demonstrate they are verified. • If a requirement was not met, indicate how it would be met in a future implementation, or indicate why it cannot be met. • This information should be organized in a table with entries for the requirements and the verification.
4.3 Standards	Identify standards employed in the project and indicate how they were employed.
5. Summary and Conclusions	Summarize conclusions about the project, and make recommendations for further work on it. Also indicate important lessons learned in the design process.
6. References	Include references for this items cited in the report. Use the IEEE method of citation.
Appendix A: Project Management Plan	<ul style="list-style-type: none"> • A.1. Include the Work Breakdown Structure. • A.2. Member contributions. Include subsections summarizing each team member's accomplishments on the project. • A.3. Development Costs. In a table or spreadsheet format, document all project costs.
Appendix B: Software	You may put this on CD-ROM (preferred) and submit it with the hardcopy report. If you print software, print it in 10 pt. courier – see formatting instructions.
Appendix C:	Include other appendices at your discretion. This may include specification sheets, standards information, etc. It is not necessary to include specification sheets for all parts you are using, but you should identify them in the Reference section. Product specification sheets should only be included if they are critical to reading of the report.

Cover page Format

Reports must have a cover page format that is as follows (center it vertically on the page):

An Electronic Heart Monitoring System

by

Midshipman 1/C Lisa Jones and Midshipman 1/C Robert Smith

A Senior Project Report Submitted to the Faculty of
the Electrical Engineering Department
United States Naval Academy, Annapolis, Maryland

Faculty Supervisor(s): Dr. Martin
Outside Sponsor: JIEDDO

April 2007

Report Formatting Instructions

- **Include page numbers in the bottom center of each page.**
- **Double-sided copies are recommended for the final bound report.**
- Font should be Times Roman 12 point (except software printouts as indicated above, which will be 10 point Courier).
- Use 1 inch margins for the left, right, top, and bottom the page.
- Each section of the report must begin on a new page. The heading for each section should be bolded 14 point font and the sections should be numbered consecutively.
- You can have subsection headings within the sections at your discretion. They should be numbered properly (for example, 1.1, 1.2, 1.2.1) and the headings for the subsections should be 12 point font and bolded.
- Figures in the text should be numbered consecutively, and properly labeled with the figure number and caption underneath the Figure. The figure numbers should be used to refer to figures in the body of text. An example Figure caption would be: Figure 1. Proposed conceptual design.
- Tables in the text should be numbered consecutively, and properly labeled with the table number and caption underneath the table. The table numbers should be used to refer to tables in the body of the text. An example table caption would be: Table 1. Design specifications.
- All equations should be numbered consecutively, with the equation centered and the number right justified and inside parentheses. For example an equation would be shown as

$$f(x) = x^2 + 3x + 5. \quad (1)$$

You then use the equation number inside parenthesis to refer to it in the body of the text.

- Example for references

In body of report: “Analog LVDT signal conditioners that operate by demodulating $s(t)$ utilizing op amps and transistors can be designed, but they require stable sine wave generators and phase compensation networks to operate properly [1].”

Then refer to it in the reference section as follows:

[1] G. Novacek, "Accurate Linear Measurement Using LVDTs," *Circuit Cellar Ink*, Issue #106, pp. 20 – 27, May 1999.

Final Technical Presentation

During the last week of the semester, your team will make 30 minute presentation (total time allotted is 45 minutes) to the faculty committee associated with your project. The faculty should be familiar with the projects at this point. There is no single way to present the material, but here are recommendations for the presentation.

- **Introduction & Problem Statement.** Provide a **brief** overview/need/motivation of the project.
- **The Final Design.** Describe the final design implementation. It should contain a detailed description of the final design and its operation. A good way to organize it is to provide a high-level overview of the entire design and describe how it operates. Then provide detail and description for each of the successive hardware/software subsystems.
- **Testing & Results.** Describe/demonstrate the key tests and results that show the functionality of the design. If applicable, a "Show and Tell" presentation of the working project is good – just make sure it is easy to setup and show. As an alternative, you can videotape the operation of it and incorporate that in the presentation. A VCR is available.
- **Realization of Engineering Requirements, Standards, and Constraints.** Indicate how the project did or did not meet these.
- **Conclusions.** Summarize conclusions about the project, and make recommendations for further work on it. Also indicate important lessons learned in the design process.

Ground Rules

- Prepare for a 30 minute presentation.
- The question & answers typically last 10-15 minutes. The questions may be posed during the presentation, not just at the end of it.
- Use PowerPoint for your presentations. It is best to place them on a thumb drive or email them to yourself so your team can access them in the conference room.
- Uniform of the Day – Service Dress Blues.

Final Poster Presentation

On the day of your final presentation, you also need to have a poster ready to display. This poster, which can be created on your computer and printed in MSC on poster board, should present a summary of your project. This is a chance to be creative, but not too creative. You do not want your poster to be so busy that it is difficult to discern what the project was about. Several examples of these posters are in the Senior Design Laboratory.

In addition to displaying these at your final presentation, we will also be holding a poster session, open to all faculty on 29 April. You are encouraged but not required to attend since it is on the reading day before finals. If you do attend, you should be prepared to stand by your poster and answer questions about your project. The Academic Dean, the Division Director and the Superintendent will all be invited to stop by. It will be held only in the morning of the 29th and will last for approximately 2 hours.

Finally, your posters will be on display at the EE Awards ceremony during Commissioning Week, the one where your family/parents are invited, so your poster should be in good enough taste for this diverse group of people.

The Poster will be 40 inches wide by 30 inches high. It should contain a large title of your project visible from several feet away. It should contain graphics as well as text to explain your project and its significance.