

Experiment 12: Preparing Final Report

Get your Project Proposal Feedback Now!

Today's Task

Spend your time today progressing on your project as proposed in the report you just submitted. If you have questions regarding your proposal, feel free to ask the TA. If you are unsure of how to move forward some aspect of the project, feel free to find an **Explore More! Module** that may provide details on how to solve a particular problem. The modules are also likely to stimulate ideas that might map to your final project.

Final Report Guidelines

The report for your Final Project will follow the same guidelines as your lab 10 report. The Final Project Report is due at the end of your demonstration during the final week of laboratory sessions.

Below is a general outline of what things would be found in a good final report. The report should be typed and all figures (graphs and schematics) generated electronically. Please note that the outline shown below provides a recommendation of what things should be found in a report but the order of the sections/subsections does not need to match this outline. The goal of your report should be to provide enough detail about your design and methodology so that another engineer could read your report and duplicate your design (or pick up where you left off).

One report must be submitted by each team of two students. If your design is part of a larger group project, the reports may be submitted as one large document but the separate "team of two" reports must be clearly marked corresponding to its authors. There is no minimum page requirement but a good final report is often around 10 pages long, including figures.

Suggested Report Outline

1) Introduction

- **Problem description**

For multiple team projects, this should describe the overall project at a high level and the specific portion done by your two person team. This is likely to be similar to the problem description from your proposal but should be updated for changes made to the project since then. Specifically, this should outline what goals your design must accomplish.

- **Design concept**

Give an overview of your design. This should be at a pretty high level and give a basic idea of how your design accomplishes your goals.

This design concept should include two parts. The first is in regard to the design of some sort of

sensor based navigation. The second is the design of some other sensor based functionality of your choosing.

2) Analysis of Components

- **Characterization of each sensor**

Describe each sensor used in your design and what it does.

Include tables of measurements made, the experimental setup used to collect those measurements, and any graphs, linear curve-fits or mathematical characterizations that are relevant to your design.

- **Design considerations**

Describe the design decisions that resulted from the characterization of your sensors.

Did the behavior or sensitivity of the sensor affect where the sensor was placed on the vehicle?

3) Design Description

- **Block diagram**

Hierarchical graphical outline of your design. Each block in the diagram should represent a circuit or device. See Experiment 8 for an example of a block diagram.

- **Circuit schematics**

Schematics should correspond to blocks in the hierarchical diagram.

If Arduino is used, block diagram of its functionality is required.

A qualitative description of the circuit design should be included so that the circuit can be quickly and easily interpreted by the reader. (Please do not simply write a verbal description of how each circuit component is connected to each other component. This is neither useful nor worth any points.)

- **Physical/mechanical construction**

Describe any relevant mechanical aspects of your design, e.g. how each sensor is mounted on the vehicle and where or the method used to mount a given actuator.

Photographs of your vehicle/project are highly encouraged, especially if those photos are annotated with labels.

4) Conclusion

- **Lessons learned**

What unexpected obstacles did you encounter in your design process? How did you overcome them? Please note that this should only include lessons learned about your design, not your personal study habits.

- **Self-assessment**

Make sure to directly address how well your design performed the tasks outlined in your introduction.

We *might* choose to make an example final report available to you for reference. Ask your TA.

Rubric to be used for your Final Project Demonstration

Keep this rubric in mind as you prepare for your demonstration. This is *not* the rubric used for grading your final report.

Project Title:

Name	Ability to communicate technical content

Presentation	Possible	Grade
Basic design concept	5	
Sensor and feedback loop described	5	
Demonstration of functionality (or a detailed explanation of why it doesn't work)	5	
Ability to answer questions	5	
Did you use one or more Extra Sensors?	Up to 3 (extra credit)	

Total	20	
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Which sensor(s) did you use?

Name the challenging aspects of your analog circuit design.

Is your breadboard design neat and efficient?

Name the challenging aspects of your Arduino code (if applicable).