Alpha/Omega Lab Project Plan

Contents

This is a guideline to help you and your supporting instructors, TAs, and SAs determine if your plan for the semester is well-defined and feasible. You **must fill out this today** and submit it to Gradescope by the beginning of the next lab. YOU WILL BE ASKED TO ITERATE and resubmit at least two more times this semester. You CAN CHANGE YOUR PLAN. It's part of the process of learning. It will get better. See the example Project Plan below for more details on what is expected. A general overview of what is expected for your lab submissions can be found on the course website under Alpha Experiments - Omega Lab Explorations.

Choosing Lab Type

	Do you plan to do an Alpha Experiment? Write "Yes" or "No" below if you intend to do the guided design project at the end of each lab	**Do you plan to do an Omega Exploration?** Write down the project you plan to complete from the Omega Explorations list in the corresponding lab document.
Lab01: Basic Analysis and Engineering Practices	**No**	**Wheatstone Bridge Temperature Sensing Circuit**
Lab02 Part A: Linear Systems and Beyond…	**Yes**	
Lab03: The Signals and the Noise	**No**	**Modify Your Favorite Song Using Filters**

Important Details for your Plan

Trainings, Visits, and Access to Labs

Please check all of the trainings or visits or access you think you need <u>if you are doing Omega Explorations:</u>

	Training, Visits, and Access	Purpose for your Project
✓	**I plan to use the Mercer XLab, I need access.**	I may need to more accurately measure temperature. I want to use professional grade equipment and compare to our boards!
✓	**I plan to schedule a visit for the clean room (can also be done as an Omega Exploration for Lab 02).**	I am interested in learning more about how electronics are made, even though I'm doing an alpha lab.
	I plan to schedule a tour of EMPAC.	
	I would like to access other resources on campus that are not listed here.	Resource: Purpose:

Goals and Objectives

*Outline your **goals, team member roles with names, deadlines** for at least Lab01. Try to fill out as much as you can for the other Labs so the TAs and UGSAs can give you advice.*

Lab 01 (Date: Sept 28th deadline for submission)

Part A:

- Steph: Simulations for Concepts 1, 2; Analysis for 3, 4; Build/Measure for 5
- Draymond: Simulations for Concepts 3, 4; Analysis for 5; Build/Measure for 1, 2
- Cassius: Simulations for Concept 5; Analysis for 1, 2; Build/Measure for 3, 4
- All: Make write, clearly label in PowerPoint if needed, finish first draft using template
- Update Proof of Skills if above is better than previous submissions

Part B: Omega Exploration – Wheatstone Bridge Temperature Sensing Circuit

- Steph: Learn how to use thermistor (research online)
- Steph: Measure thermistor resistance vs. temperature to compare to datasheet
- Cassius: Sketch of idea/circuit (reference online information)
- Cassius: Simulation of circuit
- Draymond: Build and troubleshoot
- All: Finish write up, clearly label in PowerPoint if needed submit

Lab 02 (Date: November 9th deadline for submission)

Parts A and B: (Date: November 9th deadline for submission)

- Steph: Simulations for Concepts 1, 2, 3; Analysis for 4; Build/Measure for 5
- Draymond: Simulations for Concepts 4; Analysis for 5; Build/Measure for 1, 2, 3
- Cassius: Simulations for Concept 5; Analysis for 1, 2, 3; Build/Measure for 4
- All: Make write, clearly label in PowerPoint if needed, finish first draft using template
- Update Proof of Skills if above is better than previous submissions

Parts C and D: (Date: October 25th deadline for submission)

- Steph: Simulations for Concepts 8; Analysis for 9; Build/Measure for 6, 7
- Draymond: Simulations for Concepts 9; Analysis for 6, 7; Build/Measure for 8
- Cassius: Simulations for Concept 6, 7; Analysis for 8; Build/Measure for 9
- All: Make write, clearly label in PowerPoint if needed, finish first draft using template
- Update Proof of Skills if above is better than previous submissions

Lab 03 (Date: December 10th deadline for submission)

Parts A, B, and C:

- Steph: Simulations for Concepts 1, 4; Analysis for 2;
- Draymond: Simulations for Concepts 3; Analysis for 1, 4;
- Cassius: Simulations for Concept 2; Analysis for 3; Build/Measure for 4
- All: Make write, clearly label in PowerPoint if needed, finish first draft using template
- Update Proof of Skills if above is better than previous submissions

Part D: Modify Your Favorite Song Using Filters

- Draymond: Research programs for modifying audio files (Simulink? Audacity?)
- Cassius: Research which frequency ranges correspond to which instruments
- Steph: Plan for which frequency ranges and instruments to isolate or eliminate
- Draymond: Modify song in chosen program
- Cassius: Analysis of results
- Steph: Proof of Concept
- All: Presentation video

Reason for update (if applicable)

- October 13th: more detail added to student roles for Lab 02, Parts C and D. Roles assigned for Part D of Lab 03.

Parts List (Omega Explorations only)

List an expected number of parts you will need that are not in your parts kit. List the cost of parts you want to purchase.

Lab 01 and Lab 03: None. We'll use what's in our kits.

What potential issues do you foresee with this design project?

Lab 01 and Lab 03: Time. Draymond keeps arguing with everyone and is a bit pushy, which I guess could be good for getting things done on time.

What skills and concepts do you need to learn to do this project?

Lab 01: how a Wheatstone Bridge works and how a thermistor works.

Lab 03: more practice with Simulink. What the frequency domain is. What are filters and how do we use them?

What is your plan if this design does not work?

Troubleshoot and redesign. Check mathematical analysis and assumptions. Ask TAs for help.

TA/SA/STUDENT "Is this plan right?" Checklist

A TA or SA must check each of these items to pass the plan. Be prepared to answer each of these questions with justification. This will be done via Gradescope.

☐ Has a lab type (alpha or omega) been selected for each lab? Has a project topic been chosen for all indicated omega explorations?

☐ Are project goals or milestones (complete Part A, for example) listed for each lab?

☐ Are team member roles (analysis, simulation, Part A, Part B, etc.) assigned to team members for each lab?

☐ Are deadlines for each milestone listed for the next lab? Are the deadlines reasonable?

Team Signatures (online via Gradescope)

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TA or UGSA Signature (online via Gradescope)

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