Alpha/Omega Lab Project Plan

Contents

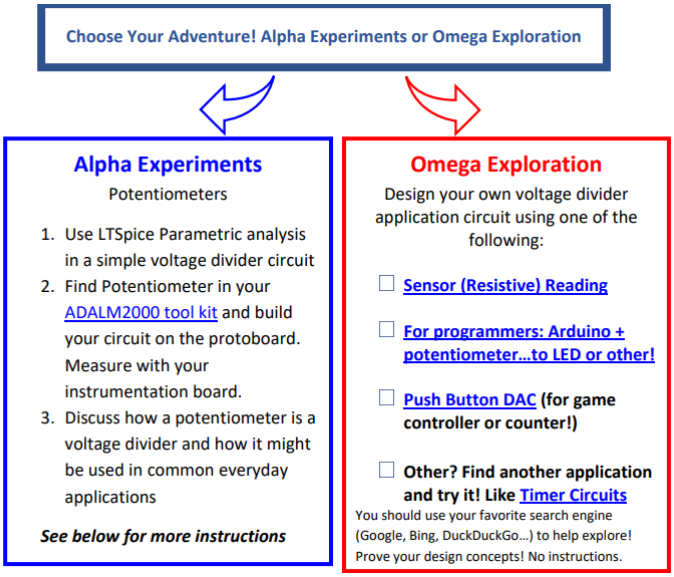
This is a guideline to help you and your supporting instructors, TAs, and SAs determine if your project is well-defined and feasible. You must fill this today and submit to Gradescope by Monday. YOU WILL BE ASKED TO ITERATE and resubmit at least two more times this semester. You CAN CHANGE YOUR PLAN. 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. This document is the general overview of what is expected for your lab submissions.

Choosing Lab Type

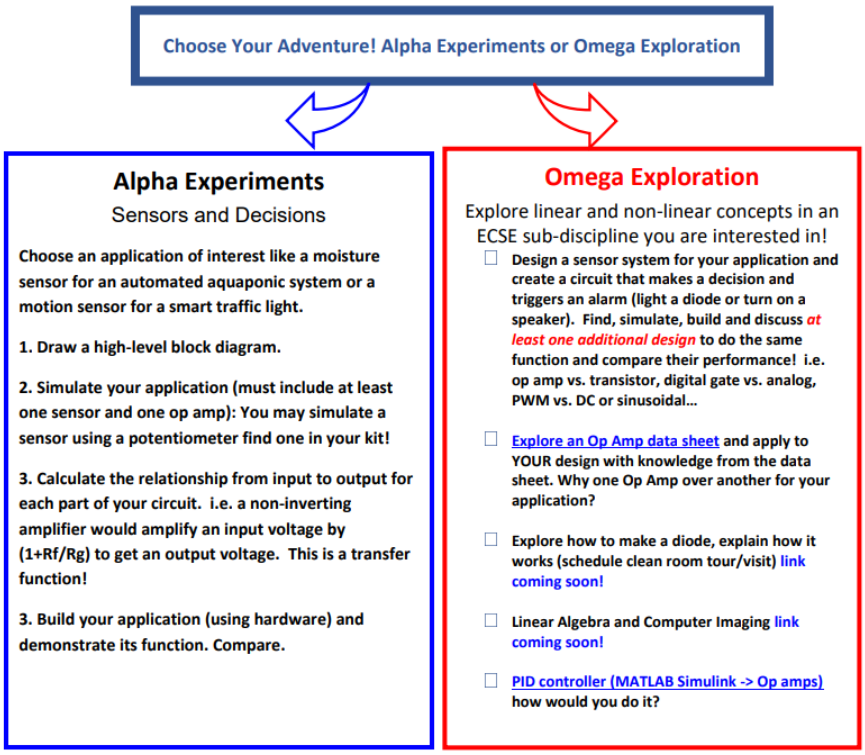
	Do you plan to do an Alpha Experiment? Write Yes or No below if you intend to do the guided design project at the end of each lab	**Do you plan to do an Omega Exploration?** Write idea from the less guided exploration list OR write your own project idea below (note: your idea must relate to concepts in the lab!)
Lab01: Basic Analysis and Engineering Practices Link to first class day videos background		
Lab02 Part A: Linear Systems and Beyond…. Link to first class day videos and background		
Lab03: The Signals and the Noise (and Making Music) Coming soon!		

Background on YOUR Lab Adventure

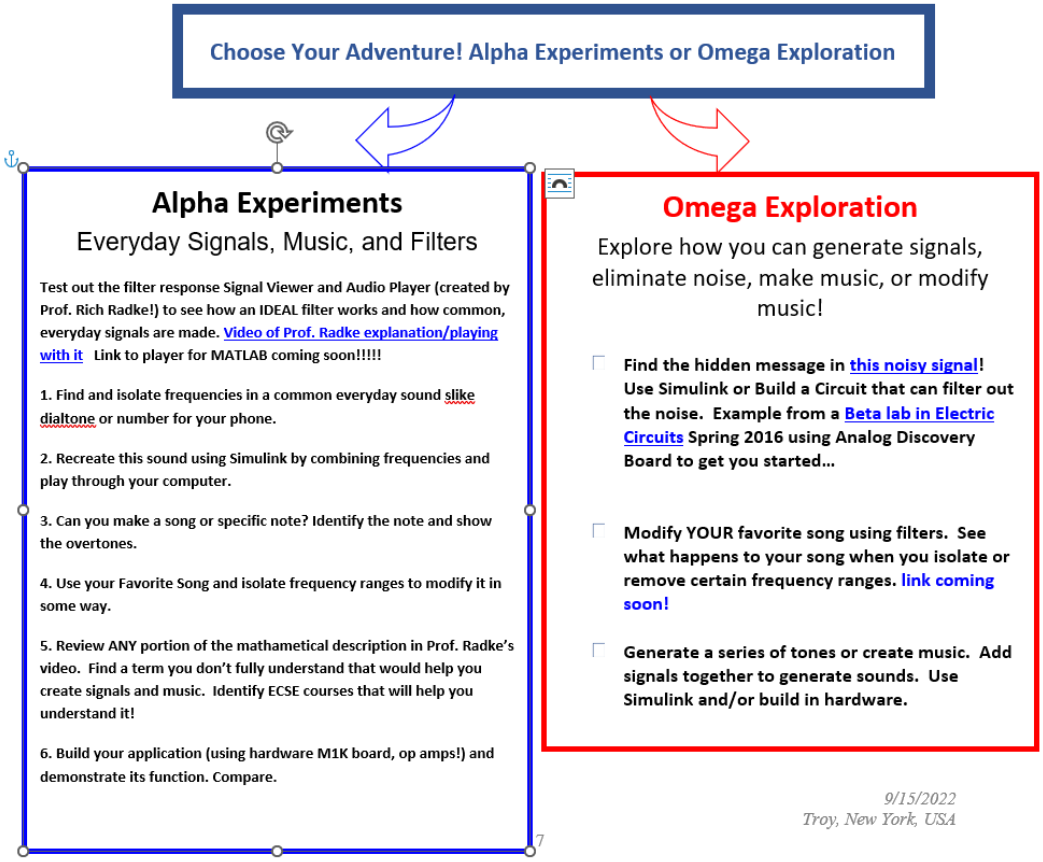
Lab 01 Choose Your Adventure! Voltage Divider Applications and Design Background



Lab 02 Choose Your Adventure! Applications: Transfer Functions, Linear Algebra, and Control



Lab 03 Choose Your Adventure! Music to MY ears: Filters and Signal Processing



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 Lab, I need access.	
	I plan to use the Forge for 3D printing.	
	I plan to schedule a visit for the clean room as an Omega Exploration for Lab02.	
	I want to learn how to design a Printed Circuit Board (Altium - Free enrollment).	

Goals and Objectives

Outline your goals, team member roles, deadlines for at least Lab01. Try to fill out as much as you can for the other Labs so the TA can give you advice.

Lab 01 (Date:)

Lab 02 (Date:)

Lab 03 (Date:)

Reason for update (if applicable)

Parts List

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

What potential issues do you foresee with this design?

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

What is your plan if this design does not work?

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

A TA must check each of these items to pass the plan. Be prepared to answer each of these questions with justification.

☐ Can the project be completed in the given time?

☐ Do the Goals and Objectives provide a reasonable pace for the project?

☐ Does the project align well with the learning objectives of the course?

☐ Is the circuit size and cost reasonable?

Team Signatures (online by Gradescope not physical)

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_____

_____

TA Signature

_____

Project Plan Example

This is a guideline to help you and your TA determine if your project is well-defined and feasible. You must fill this out anytime you want to change your project and at the beginning of each Milestone period. **You only need to cover your plan for the upcoming Milestone** but try to plan as far as possible. This will help the TA and Professor give you feedback on how to adjust your project to be more manageable and give advice on how to implement certain parts.

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 idea from the less guided exploration list OR write your own project idea below (note: your idea must relate to concepts in the lab!)
Lab01: Basic Analysis and Engineering Practices Link to first class day videos background	No	***Sensor (Resistive) Reading*** Water Quality (Dissolved Oxygen Sensor but modeled by a potentiometer)
Lab02 Part A: Linear Systems and Beyond…. Link to first class day videos and background	YES	
Lab03: The Signals and the Noise (and Making Music) Coming soon!	No	**Modify YOUR favorite song using filters** I will learn how to recreate Kanye's STEM Player

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 Lab, I need access.**	I may need to view high frequency signals and use a spectrum analyzer. I also want to use professional grade equipment and compare to our boards!
	I plan to use the Forge for 3D printing.	
✓	**I plan to schedule a visit for the clean room as an Omega Exploration for Lab02.**	It's not directly related since I'm doing alpha but I am interested in seeing this!

Goals and Objectives

Outline your goals, team member roles, deadlines for at least Lab01. Try to fill out as much as you can for the other Labs so the TA 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 Concepts Simulations for Concept 5, Analysis for 12, Build/Measure 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:

"Simulate" Dissolved O2 sensor with potentiometer

Steph: Learn how to use potentiometer (see end of Lab01)

Steph: Figure out how to read sensor using potentiometer

Cassius: Sketch of idea/circuit…reference online information

Cassius: Simulation of idea

Draymond: Figure out voltage divider vs. wheatstone bridge

Draymond: Build and troubleshoot

All: Finish write up, clearly label in PowerPoint if needed submit

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

Repeat task roles for all Parts.

Part A

Part B

Part C

Alpha Lab Part D…maybe still visit clean room?…looks cool.

Virtual reality body glove, flex sensors

All: Draw high level block diagram in class, Steph check with TA

Steph: Research each block for circuits we can use..op amp, flex sensor, amplifier etc.

Draymond: Simulate in LTSpice

Cassius: Build and Measure

All: Compare and comment on proving sensor decision circuit…transfer functions? Research what that is!

November 3rd send iterations from Lab01

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

Lab not out yet…keep task roles for all parts when coming out

Reason for update (if applicable)

Parts List

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

None, we'll use what's in our kits

What potential issues do you foresee with this design?

Time. Draymond keeps arguing with everyone and is a bit pushy which I guess is good.

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

All of them.

What is your plan if this design does not work?

Troubleshoot and redesign.

Ask TAs for help

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

A TA must check each of these items to pass the plan. Be prepared to answer each of these questions with justification.

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☐ Do the Goals and Objectives provide a reasonable pace for the project?

☐ Does the project align well with the learning objectives of the course?

☐ Is the circuit size and cost reasonable?

Team Signatures (online by Gradescope not physical)

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TA Signature

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