

## **PHYS 319 Spring 2021**

### **Course Outline**

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Labs: T, W, Th 2-6 pm, On Line

Lecture: Th 11:30-12:30 On Line

Text: Introduction to Embedded Systems Using Microcontrollers and the MSP430. Available for download from the UBC library at <http://webcat2.library.ubc.ca/vwebv/holdingsInfo?bibId=7372090>. We won't follow this text closely, but its a great reference.

Web Page: The lab manual and many other helpful links can be found on the course web page at [http://www.phas.ubc.ca/~kotlicki/Physics\\_319](http://www.phas.ubc.ca/~kotlicki/Physics_319)

#### Introduction:

In this course, you will learn how to program a microcontroller and have it interact with the world via devices like sensors, motors and displays. For the first 6 weeks, you will follow a lab manual to get started on the basics of learning how to program the devices. The remainder of the course is project-based. You will need to choose a project, acquire the parts needed, build the circuitry required, and write the code for your microcontroller to make it work.

You will have to program the devices from your own computer. We have prepared set-up guides for Windows, Mac, and Linux, including Linux run from the USB image, which will walk you through the steps of installing the software tools you will need. You should attempt to go through the relevant steps in the set-up guides before coming to the labs in weeks 2, 3, and 5. We will do our best to help you with any problems during the lab time.

## Grading Scheme:

Lecture questions and tests, homework and activities: 25%

Programs and lab reports for weeks 1-6: 20%

Project proposal & status report: 5%

Project quality and functionality: 20%

Oral presentation: 10%

Final written report: 20%

Late work: The maximum mark is reduced by 10% per day.

Week  
of

Classes	week of	Lab	Lecture	Due
1	11-Jan-21	no lab		1
2	18-Jan-21	Lab 1		2
3	25-Jan-21	Lab 2		3
4	01-Feb-21	Lab 3		4 Lab 1 and 2 report before lab 3, Activity 1 and 2 before lecture
5	08-Feb-21	Lab 4	5 and test 1	
6	15-Feb-21	Reading break	Reading break	
7	22-Feb-21	Lab 5		6 Lab 3 and 4 report before lab 5, activity 3 before lecture
8	01-Mar-21	Lab 6	7 and test 2	Project description to discuss during the lab
9	08-Mar-21	Project		8 Lab 5 and 6 report
10	15-Mar-21	Project		9
11	22-Mar-21	Project	Project help	
12	29-Mar-21	Project	Project help	Progress report
13	05-Apr-21	Project	Project help	
14	12-Apr-21	Project	Project help	Final report due on Canvas