**How to do “lab” assignments for ECE 211 (Summer 2021)**

We do not have traditional labs like the ones you may have had in ECE 101/2/3. In ECE 211 you are assigned a subset of “lessons” from materials written by Elegoo company, which some of you may have already worked on in ECE 103. The main motivation for these lab exercises is to make sure each team member has some basic proficiency in programming a microcontroller. This year labs will be done individually because we cannot hold team meetings. To keep things simple, in summer 2021 we will ask you to use the Arduino board that comes with the kit from Elegoo.

Some teams may want to use a more advanced microcontroller ESP32 and normally we would use Huzzah32 from Adafruit for these exercises. Programming ESP32 is very similar to Arduino and uses the same IDE. However, there are some subtle differences that you would have to take into account. In return, you get advanced capabilities in communication via Bluetooth and WiFi, as well as access to cloud services that enable IoT functionality. If you would like to pursue this further, please let your Scrum Master (helper) know and discuss it with him/her. We have a set of instructions that will help you with installation and use of Huzzah32 and these will be posted on D2L.

There are three labs: Lab0, Lab1 and Lab2, which are outlined below. Each lab consists of:

1. Lessons related to each lab. For Lab0 there is only one lesson: “Lesson – RGB LED”, but Lab1 has five lessons, and Lab2 has four lessons.
2. Lab Guide, e.g. “ECE103\_Lab-A0\_Guide\_Fa2019”
3. Lab Worksheet, e.g. ECE103\_Lab-A0\_Worksheet\_Fa2019”
4. For each lab there is a set of \*.ino files and/or libraries that you will need. Usually, you are asked to make some modifications to the files provided.

So, how do you work on these labs? In Summer 2021 we are assigning these labs as \*\* individual \*\* exercises. This means that each student will have to demonstrate the entire lab assignments.

If you have done these labs as part of ECE 103 or similar course, let me know. We can make arrangements for you to work on something more exciting than repeating the same labs. In ECE 103 labs are meant to be done in one 2-3 hour long dedicated lab session so I hope that you will able to work through the labs in about that amount of time.

Working on a given lab would proceed along these lines:

* Typically, you would start your work on a given lab by reading the lessons for that lab
* Follow that by reading the lab guide (which gives details of the assignment).
* Start working on the assignments.
* Fill in the worksheet.
* Demo various part of the assignment to your scrum master, possibly by recording a video or taking a photo.
* Upload some of your work on D2L.
* Scrum master notifies the instructor that you completed the assignment.

If in doubt about how all this is supposed to work talk to your scrum master first.

1. The first lab is mostly about installing the IDE and making sure that each student can write and upload programs. Each team member must demonstrate a functioning IDE and blink program.
2. Lab1 explores various components that can be connected to Huzzah32 and how to interface to them.
3. Lab2 deals with more advanced sensor applications and how to control an LCD module.

It is quite possible that some unanticipated issues will come up but the biggest delay will likely be due to late arriving kits. We will be flexible in terms of deadlines but it is critical that you communicate frequently with your scrum master and instructor – we will figure it out 😊 .