Welcome to Microprocessor Prototyping 180:

In this course we will learn the fundamentals of building prototype eleconics hardware using Arduino. We'll discuss the basics of programming in Adruino's C/C++ like language; as well as how to interface the Arduion with a variety of other devices. The goal of this course is to give a broad and well rounded introduction to prototyping. You probably won't leave with all the skills you need to complete any given project outside the scope of the course, but you'll have a hard time finding a project for which something from this course wasn't relevant.

About your instructor
Kevin John has been a prototyping engineer and programmer with the Education and Public Outreach group at Sonoma State for several years. He graduated with a degree in physics from SSU in 2007 and has been at the group as a programmer since that time. The group started transitioning into prototype hardware projects in 2011. Kevin has overseen the development of several Arduino based projects, as well as projects using other microprocessors running lanugages like Logo.

Course Philosophy
This isn't a class on electrical engineering, and neither is it a class on computer science or programming. The objective in this course is to teach only enough of either of those concepts to achieve our design goals. Because this is a course on rapid prototyping, we will adpot a philosophy of quickly developing a (somewhat) working prototype instead of spending lots of time working on a well designed prototype.

Course Tools

Windows 10
The course will be taught using the Windows 10 computers that are already available at 180 Studios. This will ensure some uniformity, eliminate course fragmentaiton, and make things easier on your instructor. Of course, you may want to work on anothe operating system at home or on other projects. The course program files will run on any OS (Windows, Mac, Linux) without modificaiton. Setting up your development environment on another machine isn't hard, and you can find instructions here: https://www.arduino.cc/en/main/software

Github
All the course files are available through our GIT repository.
https://github.com/180Studios/mp180
If you're not comfortable using GIT, you can download the files as a zip folder instead. Click on the green 'clone or download' button, and then click on the 'Download Zip' option. There are two main branches of the code available. The 'student' branch will be loaded onto the computers during the course; this version has pieces of the code missing that are left as an exercise for the user to complete. The 'master' branch contains the completed versions of the source code.

Materials
In order to avoid issues with parts, students are required to pay a materials fee to cover the costs of the hardware. In order to make the ordering process less error prone, we are not allowing students who may already own some of the parts to bring their own and defer the cost of parts. However, if you would like to work with a partner and share parts, two students may split a single parts kit. These parts of yours to keep. You may take them home between classes, but its strongly recommended that you

leave your parts at 180 studios so nothing gets lost.

Class Schedule
This course has been designed to stretch over 4 two-hour class blocks. Since the pacing of the course is very fast, each class will be followed by an extra hour of workshop time. This is an oppertunity to finish any tasks that run long; or even work on your own projects with help from your instructor. This course was not designed to allow students to pick which class sections are most interesting to them and only attend those. If you should not expect to be able to miss and continue the next class session.