

PHYS3500 Spring 2019

PHYSICS, MAKING, AND ARDUINOS

Course Description

This class consists of seven 2-hour lecture/lab breakout sessions which will introduce the Arduino microcontroller, its software, and various useful sensors and actuators that may be used with it. The techniques demonstrated in class will enable the student to construct various inexpensive measurement and control devices for research or outreach applications. The student will construct a project at the end of the class. Lectures and assignments will be coordinated through Canvas (canvas.usu.edu).

Prerequisite/Restriction: PHYS 2710 and permission of instructor.

Fees

None.

Course Objectives

By the end of this course, you will be able to:

1. Build prototypes using the Arduino Uno and electronic components.
2. Create software to control the prototypes.
3. Use off-the-shelf hardware with Arduino for lab applications.

Instructor

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Course Resources

[Kuman Arduino Starter Kit](#)

Course Requirements

Each class will consist of short lectures interspersed with student activities that demonstrate the concepts. Thus students are expected to be present and have the starter kit and a computer to follow along with the activities.

A short homework assignment will be required after each session. Students will undertake a simple project at the end of the course that demonstrates their understanding of the basic principles.

Evaluation Methods and Criteria

Points will be given for in-class activities and homework. Homework assignments will involve constructing, analyzing, and demonstrating simple applications. A final project chosen by the student will be demonstrated at the end of class. The final grade will be based on:

- Attendance: 20%
- Homework: 50%
- Final project: 30%.

Grade Scheme

The following grading standards will be used in this class:

Grade	Range
A	100 % to 93.0%

A-	< 93.0 % to 90.0%
B+	< 90.0 % to 87.0%
B	< 87.0 % to 83.0%
B-	< 83.0 % to 80.0%
C+	< 80.0 % to 77.0%
C	< 77.0 % to 73.0%
C-	< 73.0 % to 70.0%
D+	< 70.0 % to 67.0%
D	< 67.0 % to 60.0%
F	< 59.0 % to 0.0%

Attendance and Excused Absences Policy

Attendance is required. Excused absences may be arranged but the student will be responsible for covering the material that was missed.

Nonattendance Policy

Students May Be Dropped For Nonattendance

If a student does not attend a class during the first week of the term or by the second class meeting, whichever comes first, the instructor may submit a request to have the student dropped from the course. (***This does not remove responsibility from the student to drop courses which he or she does not plan to attend.***) This option is typically used for classes that are full and the instructor is trying to make a seat available for another student, but may be considered for other courses. Requests must be made during the first 20 percent of the course and will be considered on an

individual student basis. Students who are dropped from courses will be notified by the Registrar's Office through their preferred e-mail account (see [2018-2019 General Catalog](#)).

Classroom Civility.

Utah State University supports the principle of freedom of expression for both faculty and students. The University respects the rights of faculty to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede the learning process. Disruptive classroom behavior will not be tolerated. An individual engaging in such behavior may be subject to disciplinary action. Read [Student Code Article V Section V-3](#) for more information.

Sexual Harassment/Title IX

Utah State University is committed to creating and maintaining an environment free from acts of sexual misconduct and discrimination and to fostering respect and dignity for all members of the USU community. Title IX and [USU Policy 339](#) address sexual harassment in the workplace and academic setting.

The university responds promptly upon learning of any form of possible discrimination or sexual misconduct. Any individual may contact USU's [Affirmative Action/Equal Opportunity \(AA/EO\) Office](#) for available options and resources or clarification. The university has established a complaint procedure to handle all types of discrimination complaints, including sexual harassment ([USU Policy 305](#)), and has designated the AA/EO Director/Title IX Coordinator as the official responsible for receiving and investigating complaints of sexual harassment.