

First Year Projects in Physics: PHY 1100

Fall 2026

General Information

Necessary Class Materials: Printout of lab manuals, scientific calculator, and lab kit

Arduino kits: You will be provided an Arduino kit (Vilros Arduino Uno Ultimate Starter Kit). This kit is yours to use for the semester while in class. You may take it home to work with the instructor's permission. This kit must be returned at the end of the semester or you will be charged.

Course description: An introduction to the basic elements of physics research and applications. Students will complete a series of projects designed to integrate theory, measurement and computation to create instruments and devices that interact with the physical world. In doing so, students will learn how to create and control electro-mechanical devices and gain experience in techniques used in both industry and research.

Course learning outcomes:

<i>Course learning outcomes</i>	<i>Corresponding UNI learning outcomes</i>
Demonstrate the ability to program in C++ using the Arduino platform.	Program Content Knowledge, critical thinking skills
Build and demonstrate understanding of basic circuits.	Program Content Knowledge, critical thinking skills
Demonstrate the ability to write abstracts and label figures.	Program Content Knowledge, Communication, critical thinking skills

Grades

70%: Lab Reports: Each student will provide one report

30%: Final Project

Late work will be assessed a 10% penalty per day.

Weekly Schedule:

Class will be held in room 214. Each class may begin with a short discussion, but will almost always include a lab activity. It is essential to skim the lab before coming to class! There will be no exams for this course. Final projects will be presented during the last week of class.

Schedule (Tentative)

Week	Tuesday	Thursday
1	Introduction, Basic electronics, Basic coding	Lab 1
2	Lab 1	Arrays, functions
3	Lab 2, Report #1 due (Sept 8th)	Lab 2
4	Lab 3	Lab 3
5	If statements, characters, Report #2 due (Sept 22nd)	Passing variables, Lab 4
6	Lab 4	Lab 4
7	Serial Monitor, Voltage divider, Report #3 due (Oct 6th)	mapping values, Lab 5
8	Lab 5	Lab 5
9	Lab 6, Report #4 due (Oct. 20th)	Lab 6

Week	Tuesday	Thursday
10	Lab 6, Topic for Final due	Lab 7
11	Lab7, Report #5 due (Nov. 3rd)	Lab 7
12	Final Project	Final Project
13	Final Project, Report #6 or #7 due (Nov. 17th)	Final Project
14	Fall Break	
15	Final Project	Final Project
16	Final Project	Final Project
17	Final Exam Week, Final Report due (Dec. 17th) 10:00 – 11:50 am	