

Naomi Echo

ME 476C

HW 3

Due 2-28-25

Introduction

This deliverable will include the self learning I have done for ME 476C, what I have learned, as well as how I have applied it. The capstone I am doing is the CWC Generator, in order to be able to test our generators we need to use an apparatus called a dynamometer. A dynamometer tells you what the torque, current, voltage, and revolutions per minute the generator is producing. We were given a dynamometer from The Energy Club, it was a part of someone's capstone from last semester but unfortunately the arduino board is completely fried so we are not able to get any outputs. As an effect of that I learned arduino for my self learning. The figure below shows proof that I spent X AMOUNT OF TIME on Udemy learning. There is also an appendix of all of the other resources I used to learn specifics about each sensor.

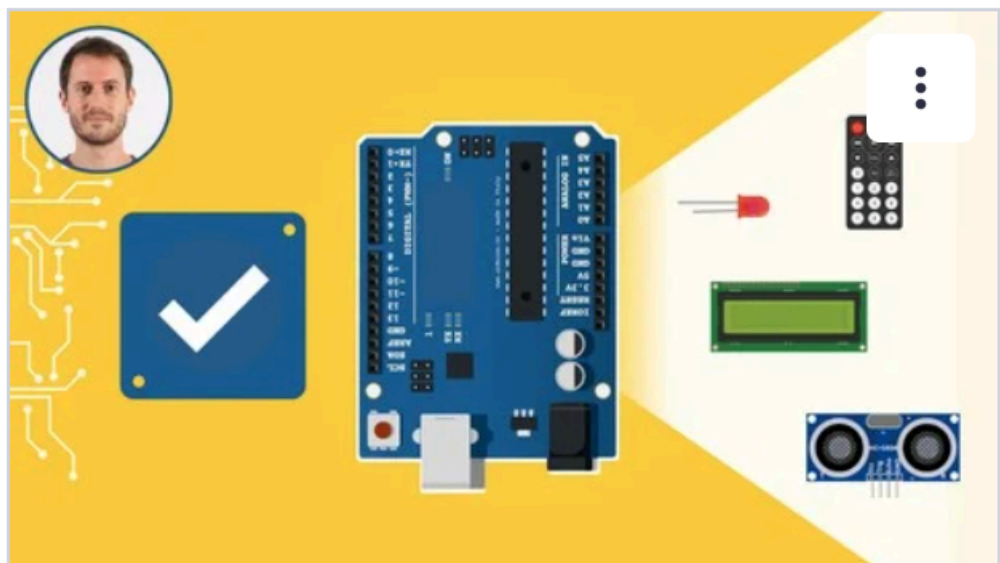
My learning

3hr watched ⓘ [View all activity](#)

All courses

Learning paths

Certification



Arduino For Beginners - 2025 Complete Course

Edouard Renard

24% complete



Leave a rating

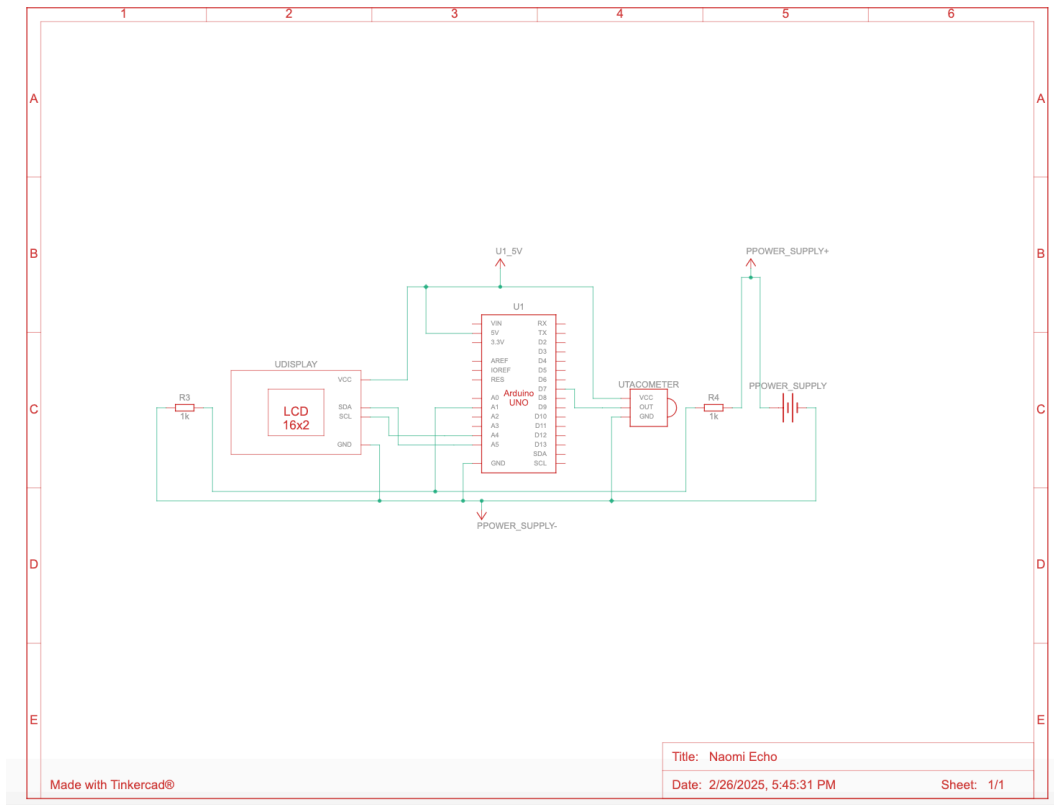
Arduino

In efforts to learn arduino I have completed over three hours of an Udemey course as well as did additional research on how a tachometer, sensor that will give a revolutions per minute output, will be implemented. Before any the arduino board is able to be functional it needs a power supply. To hook a power supply to it the negative wire needs to be attached to the ground and the positive gets attached to the VIN pin. An IR tachometer has three hook up points. They are for the ground, power(5V), and the signal output pin(display). The ground and power pins are clearly labeled on an Arduino Uno. The digital pins are the ones labeled 0-13, these can be used to send digital data to the Arduino code[2]. The IR sensor that is used to actually capluter how many revolutions per minute the generator is going will be attached to the dynamometer close to the shaft[1]. The shaft will have a piece of reflective tape on it that the IR sensor will be able to pick up on.

In order to make an arduino effective there needs to be a way to display the data, this will be through a display screen for this particular project. The display screen being used in this application has four different ports. It has a ground and power(5V) port like the IR sensor, this will be standard through arduino. There is also a serial clock line which sets the timing between the display screens, this gets attached to the A4 pin header. The last connection is the SDA, serial data line, this lets the arduino board interact with other devices. This gets connected to the A5 pin header[2].

Application

In efforts to apply my new knowledge of arduino I have made a schematic of what the arduino board will be to be able to create and communicate outputs from the dynamometer.



Conclusion

Overall, learning how to use an arduino board will be a very applicable skill. It is going to allow my group to be able to get accurate results of how our generator is performing. This deliverable only includes how to hook up an IR tachometer, display, and power supply to an arduino board because other members in my group will be mastering the other sensors required. This is extremely crucial for our project because we will be repetitively testing generators throughout the next nine months in efforts to create an efficient generator.

Sources

[1] mircemk, “Arduino tachometer (rpm meter) with IR sensor module,” Arduino Project Hub, <https://projecthub.arduino.cc/mircemk/arduino-tachometer-rpm-meter-with-ir-sensor-module-a36d7c> (accessed Feb. 26, 2025).

[2] Arduino, “Overview of the Arduino UNO Components,” Docs.arduino.cc, <https://docs.arduino.cc/tutorials/uno-rev3/intro-to-board/> (accessed Feb. 26, 2025).