Course number and name: ECE 395 Section 104 Microprocessor Laboratory (CRN: 16149)

Credits: 2

Contact hours: 4 hours (Mondays 6-10 pm)

Name(s) of instructor(s) or course coordinator(s): Amirarsalan Moatazedian

Instructional Materials: https://ecelabs.njit.edu/ece395/

Specific course information (Brief description of the content of the course (catalog description)):

Prerequisites: ECE 291, ECE 252. In this laboratory the students are expected to learn to apply their theoretical knowledge of both the hardware and software aspects of microprocessors. To attain this objective the students are required to construct a microprocessor based single board computer (SBC), with adequate interfacing capabilities to be able to perform some useful control tasks. Programming of the device is done in assembly language. Some of the experiments that follow the construction project deal with software while others deal with the problems of interfacing of microprocessors.

Prerequisites or corequisites:	Electrical & Computer Engr	252	Undergraduate
And	Electrical & Computer Engr	291	Undergraduate

Educational objectives for the course (e.g. The student will be able to explain the significance of current research about a particular topic.): Familiarizing the students with the microprocessor board Hifive1 Rev B. Students deal with C, C++, and assembly languages.

Brief list of topics to be covered:

1. Lab 1 – Microprocessor Operation:
   Lab Objective
   • To learn to create a Platform IO project and write, assemble and debug code
   • To observe and document operation of microprocessor core as it executes code

2. Lab 2 – General Purpose Inputs and Outputs:
   Lab Objectives
   • To learn how to configure MCU internal peripherals
   • To learn how to operate the GPIO pins

3. Lab 3 – Annunciator (GPIO application)
   Lab Objective
   • To apply knowledge learned in lab 2 to real world application

4. Lab 4 – UART Serial Port:
   Lab Objective
   • To learn how to setup and operate MCU serial ports
   • To create functions for serial port initialization and utilization
   • To learn how to use oscilloscope to observe serial waveform

5. Lab 5 – Calculator (UART Application):
   Lab Objectives
   • To apply knowledge on the use of serial ports gained in lab 4 to solve a design problem.

6. Project (Chosen by students)