EEL4746L - Microcomputers I Lab
One Credits, Two hours, Engineering Topic.

Instructor: Rafi Ahmed


Specific Course Information:
Hands-on design experience with microcomputer systems and applications including buses, interfaces, and in-circuit emulation.

Specific Goals for the Course
a. Specific outcomes of instruction
Upon successful completion of this course, the student will:
In lab students will use ARM based LPC1768 microcontroller and mbed API to gain experience with interfacing and programming microcontrollers.

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
In this course the student will have to show
(a) an ability to apply knowledge of mathematics, science, and engineering (N/A)
(b) an ability to design and conduct experiments (simulations), as well as to analyze, interpret data (X)
(c) an ability to design a system, component, or process to meet desired needs (N/A)
(d) an ability to function in multi-disciplinary teams (N/A)
(e) an ability to identify, formulate, and solve engineering problems (homework) (X)
(f) an understanding of professional and ethical responsibility (N/A)
(g) an ability to communicate effectively (through project reports) (X)
(h) the broad education necessary to understand the impact of engineering solutions in a global and societal context (N/A)
(i) a recognition of the need, and an ability to engage in life-long learning (N/A)
(j) a knowledge of contemporary issues (N/A)
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (X)
(l) a knowledge of probability and statistics (N/A)

Brief list of the topics to be covered
1. Using mbed API to program LPC1768 microcontroller
2. Connecting LEDs and Switches to the digital system
3. Generating constant output voltage and PWM
4. Processing data from analog input
5. Interfacing LCD with LPC1768 microcontroller and sending data to LCD
6. Programming SPI-linked ADXL345 accelerometer
7. Communicating with I2C enabled TMP102 temperature sensor
8. Interrupts on LPC1768, testing interrupt latency, disabling interrupts
9. Using the mbed timers and timer interrupts
10. LPC1768 low-power modes
11. Same as EEL4746 course project, managed by Dr. Tehrani

**GRADING:**

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**Conversion of Numerical Grade to Letter Grad**

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