EEL 4742C
Embedded System Laboratory
ECE Department
University of Central Florida
Summer 2019
Created By: Sean Taheri

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Syllabus of the Course

- Instructor: Dr. Suboh A. Suboh, Ph.D.
- Instructor Office: Harris Engineering Center HEC Room 403
- Instructor Phone: (407) 882-0130
- Instructor Email: Suboh.Suboh@ucf.edu
- Instructor Office Hours:
  - ✓ Mondays and Wednesdays – From 12:00 PM To 1:00 PM
  - ✓ Tuesday – From 11:00 AM To 12:00 PM or by Appointment
- Lab Assistants:
  - ✓ **Shayan Sean Taheri** (Section 11 and 12) – Email: shayan.taheri@knights.ucf.edu
- ✓ Baogang Zhang (Section 13) – Email: baogang.zhang@knights.ucf.edu
- Lab Sessions (Sections 11 and 12): Tuesday/Thursday 9:00 AM – 10:50 AM @ ENGR0257
- Lab Sessions (Sections 13): Tuesday 02:00 PM – 03:50 PM @ ENGR0257
- One lab session per week → Duration: 3 Hours
- Topic of Interest: Microcontroller Systems, Assembly Language Programming, Data Representation, Memory and Device Interfacing, Timing Analysis, Parallel and Serial Communication, Timers, Interrupts, Signal Interfacing Considerations, and Applications

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Material for the Lab.

1) MSP430FR6xx Family User Guide (slau367o), www.ti.com
2) MSP430 Assembly Language Tools v 4.0 User's Guide: www.ti.com/general/docs/lit/getliterature.tsp?literatureNumber.
3) MSP430 Launchpad board: http://processors.wiki.ti.com/ - the bookstore, MSP430FR6989)
4) Laboratory Manual – Webcourses website for this course → http://www.ece.ucf.edu/files/labs/EEL4742-Lab-Manual.pdf

Computer Usage

1) Assembly language programming assignments. Code composer Studio (CCS) for the MSP430.
2) This software package is available at the Texas instrument website: http://processors.wiki.ti.com/index.php/Download_CCS.

- The code composer studio is installed on every computer by default. If not, the student is responsible to download and install the software on the computer. → Link: http://www.ti.com/tool/CCSTUDIO

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Topics Covered

1) Introduction (What is a micro-processor?) Lecture Notes / - Chapter 1
2) The MSP430 - Chapter 2 and - Chapter 4
3) The Development - Assembly versus C Programming Languages- Chapter 3
4) Architecture of the MSP430 - Chapter 5
5) Functions and Interrupts - Chapter 6
6) Operation modes and memory - Chapter 5
7) Parallel Input / - Output Chapter 7
8) Serial Interfacing RS232C -Chapter 10
9) Timers -Chapter 8
10) Analog to Digital Conversion - Chapter 9

Rules and Regulations

1) Not missing more than one laboratory experiment for getting the passing grade of the course.
2) Missing laboratory assignment will be treated as zero!
3) Attendance in the lab sessions is required.
4) Late submission is okay until one week.
5) Keeping a backup of all of your files is recommended.

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Rules and Regulations

6) If you cannot complete the lab in the dedicated time, you can work on it in "After Hours".

7) Accessing to the lab in "After Hours" → It is given by the department/registrar office.

8) You can use your Student ID card in order to access the lab (after it is programmed).

9) Practical demonstration of the lab along with provision of explanation on the code is mandatory for earning full credit.

10) Detecting any plagiarism in the code is informed to the instructor.

11) "After Hours" can observed on the front of the lab manual.

Lab Report

1) **Components**: Check-off, Code Correctness, Writing, Format (Cover Page, Experiment Explanation, Pasted Code, Answer to Questions, and Results), Comments/Conclusion.

2) One lab report should be submitted for each experiment

3) One or two weeks is the time period for completion of each report.

4) No more than missing two lab reports is accepted for each experiment.

5) Quality of the lab report, the integrity and the correctness/style of the code are mandatory.

Lab 1: Flashing the LEDs

Objectives: Introduction to the documentation of the MSP430 boards + Writing simple programs for flashing LEDs!

1.1) Documentation

- Take a look at the pages 1 and 2 of the lab manual.

1.2) Flashing the LED

- Let's create a project in Code Composer Studio (CCS)! → Pages 2-7.

1.3) Setting a Long Period

- Do it by yourself! → Pages 7-8.

1.4) Flashing Two LEDs

Do it by yourself! → Pages 8-9.

1.5) Flashing Two LEDs at Different Rates: Do it by yourself! → Pages 8-9.

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