EE 310

1. **Course Number & Name:** EE 310, Microprocessors and System Design

2. **Course Credit and Contact Hours:** 3 Units, 3 hours

3. **Course Coordinator:** Dr. Farid Farahmand


5. **Supplemental Materials:** Laptop for class activities

6. **Specific Course Information:**
   a. **Description:** This course discusses hardware architecture of a general-purpose microprocessor and a micro-controller, memory hierarchy and supporting peripherals in micro controllers, comparison of various micro-controller architectures and capabilities, embedded system design using a micro-controller, data transfer protocols supported by a micro-controller, process of code writing, compiling, and executing programs using an IDE and a simulator.
   
   b. **Prerequisites:** ES 210 and EE 230 or consent of instructor.
   
   c. **Co-Requisite:** EE 310L or consent of instructor.
   
   d. **Status:** ☑ Required for EE program, ☐ Elective, ☐ Selected Elective

7. **Specific Goals for the Course:**
   a. **Specific outcomes of instruction:** Upon successful completion of this course the students will gain:
      
      i. Ability to understand how microprocessors and microcontrollers operate.
      
      ii. Ability to demonstrate a working knowledge of the necessary steps and methods used to interface a microcomputer system to devices such as stepper motors, sensors, etc.
      
      iii. Ability to develop and demonstrate a structured assembly and C language program to accomplish a given task using a microcomputer.
iv. Ability to demonstrate the use of interrupts and other programming techniques related to micro-controllers. Complete the design, development, programming, and testing of a microcomputer based project.

v. Ability to demonstrate a working knowledge of microcomputer busses and the flow of data within a microcomputer system.

vi. Ability to write professional product report.

vii. Ability to operate in team and work together towards a common goal. Become a more self-motivated and self-learner individual. H. Be able to read the data sheets.

b. This course supports the following ABET Student Outcome:

i. **SO-1:** an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

ii. **SO-3:** an ability to communicate effectively with a range of audiences.

8. Brief List of Topics to be Covered:

a. Microcontroller architecture
b. Programming and problem solving
c. Introduction to assembly programming & instructions
d. C Programming
e. Stack and subroutines
f. Input/Output (I/O) ports and interfacing
g. Interrupts timers & PWM
h. Data converters
i. Serial interfaces