Summer 2019

CSE3027 Introduction to Embedded Systems

CSE3023 Computer Interfacing

- Unit coordinator: Rezwan-Al-Islam Khan
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Course Objectives:

This course serves as introduction to exciting world of embedded system and robotics.

Course Outcomes:

- Design and implement embedded circuits involving micro controllers, sensors and actuators.
- Use code and circuit design tools.
- Design, program and debug embedded sensing and control software.
- Work in collaborative teams to solve system design and implementation challenges.

Class Timetable

- **Lecture**:
  - Section 1 : Monday (AR SPL) and Wednesday (AR SPL) 8:30 AM- 9:50 AM
  - Section 2 : Sunday (AR SPL) and Tuesday (AR SPL) 08:30 AM- 9:50 AM
- **Lab**:
  - Section 1 : Wednesday (AR SPL) 01:00PM- 02:20PM;
  - Section 2 : Wednesday (AR SPL) 02:30PM- 03:50PM;

As well as the scheduled hours, each student is expected to devote **four extra hours each week** to CSE3027. This includes time spent doing assessment tasks, reading the text books, trying out ideas on the computer, planning your work, etc. If you can't spare this amount of time, you should reduce your study load, or else reduce the amount of extra-curricular work or play in your life.

Assessment

Component	Schedule(tentative)	% of Final Grade
Attendance	N/A	5%
Project Phase 1	Due after Lab 6	5%
Project Phase 2	Due After Lab 9	10%
Project Phase 3	Before Finals Week	10%
Midterm	Exam period	30%
Final	Exam period	40%

To pass the unit, you must meet the following conditions.

- You must score an overall mark of 40 or better.
- At least 80% attendance.

Textbook

- **Essential:** Atmega328p Datasheet
- **Recommended:** Embedded Systems Design with the Atmel AVR Microcontroller Part 1 and 2 - Steven F. Barrett, 2010, Publisher Morgan & Claypool

Lectures and Course Materials:

Google Class room code :

Section 1: iu4azi

***Section 2:* 89uuks**

Programming Language: C, Python

Libraries: AVR GCC

Target MCU: AVR ATMega 328P Arduino Uno/Nano board

Course Outline:

Lecture	Topics
1	Introduction to Embedded System
2	Atmel AVR Overview
3,4	Digital I/O
5	Bit-wise operators
6,7	Timers & Counters
7,8	PWM
9	Finite State Machines
10,11	DC Motor and Servo Motor
12	Stepper Motor
13,14	Analog in the Atmel
15,16	Serial Communication
17,18	I2C. Three-Axis Accelerometer
19	SPI
20,21,22	Interrupts
23,24,25	Introduction to Internet of Things
26	Review

Late work

In fairness to all students, late work will not be accepted. In exceptional cases where illness or misadventure prevent work being submitted on time, you must make an official application for Special Consideration, in accordance with the policies. Consult the unit coordinator immediately if you feel that you will not be able to meet a deadline for any assessment.

Project: TBD

Plagiarism

Plagiarism is where you use the work of another person and present it as your own. This is NOT PERMITTED.

Some Ground Rules:

1) If you arrive 20 minutes late don't bother to enter the class.

2) **Do not try to change your lab time.**

3) Please put your phone to silent during class. If you really need to take a call during the class, exit from the class without causing any interruption.

4) **DO NOT COPY ANY CODE FOR ASSIGNMENT**. Plagiarism will not be tolerated. Remember, Google is your best friend and worst enemy.

5) Do not cheat during exams.

---CHEERS---

Rezwan-Al-Islam Khan
Assistant Professor