Oklahoma State University
ENSC 3213 - Computer-based Systems - Laboratories
Spring 2019
Syllabus
Location: CEAT Endeavor - 360

Instructor:

Dr. Yanmin Gong
415B Engineering South
yanmin.gong@okstate.edu

Graduate Teaching Assistants:

Francisco E. Fernandes Jr.
Ph.D. Student
feferna@okstate.edu

Khuong Vinh Nguyen
Ph.D. Student
Khuong.V.Nguyen@okstate.edu

Textbook (required):

Embedded systems with ARM Cortex-M microcontrollers in assembly language and C
Third Edition
Author: Dr. Yifeng Zhu
http://web.eece.maine.edu/~zhu/book/

Textbook (optional):

Mastering STM32 (**eBook**)
Author: Carmine Noviello
https://leanpub.com/mastering-stm32

Course structure: Students are expected to attend both lectures and laboratories classes. Lectures will be taught by Dr. Gong and laboratories will be taught by the TAs. There is another syllabus posted online with more information about lectures.

List of materials: Our laboratories classes are time constrained. Students are expected to **work at home** in order to finish all assignments on time. The university will **only** provide the materials needed for laboratories during class time. Students are not allowed to rent or borrow lab materials outside class time. **Therefore, it is highly recommended that all students should buy their own materials.** The list of lab materials and where to buy them is given below:

Description	Where to buy	Price
Discovery kit (Part# STM32L476G-DISCO)	Mouser	$25.00
One USB cable (A-Male to Mini-B)	Amazon	$4.80
Two solderless breadboards	Amazon	$9.99
One 4 x 4 matrix keypad	Amazon	$9.99
One 28BYJ-48 5v stepper motor + ULN2003 driver board	Amazon	$13.99
Through hole 2.2 kΩ resistors	Amazon	$5.79
	Total price:	$69.56

Programming Environment: In this class, we will use a GCC-based programming environment. Specifically, all labs will be coded using the open source **SW4STM32** IDE and toolchain, also known as **System Workbench for STM32**, available for all three major operating systems (Microsoft Windows, Apple macOS and GNU/Linux). Students are responsible for setting up all the necessary software prior to the beginning of lab classes. A tutorial explaining how to set up the software is available online.

Labs Outline:

Lab 0 ..... Introduction to C and ARM programming ..... 3 weeks
Lab 1 ..... Interfacing a joystick with an LED ..... 3 weeks
Lab 2 ..... Stepper Motor Control ..... 2 weeks
Lab 3 ..... Liquid Crystal Display (LCD) Driver ..... 2 weeks
Lab 4 ..... Interfacing Keypad ..... 2 weeks
Lab 5 ..... System Timer ..... 2 weeks

Grading Policy:

- Your final laboratory grade will consist of 46% of your final course grade. All labs combined consists of 40%, the midterm exam consists of 2%, and the final exam consists of 4% of your grade.
- The grades for each lab is divided as follow:

Lab 0	Points
Homework 1	25 points
In-lab Assignment 1	25 points
Homework 2	25 points
In-lab Assignment 2	25 points
Total:	**100 points**

Labs 1, 2, 3, 4 and 5 (each one)	Points
Pre-lab assignment	10 points
Attendance and Class Participation	8 points
Code Organization	8 points
Lab Demo Questions	10 points
Primary Functionality (basic coding skills)	50 points
Secondary Functionality (advanced coding skills)	14 points
Total:	**100 points**

- **All labs must be done individually! No collaboration will be allowed!**

Late Assignment Submission: All class assignments are due at the beginning of the class on the given due date. Late work submission will be penalized by 50%, if the work is submit up to 24 hours after the due date. Late work submission with more them 24 hours will not be accepted.

Class Attendance Policy: Students are expect to attend all schedule classes. Failure to do so will result in a reduced grade. Attendance will be recorded at the beginning of every class. Please, notify the instructor and TAs in advance if you are unable to attend a class due to serious illness, accident and/or sponsored activities.

Drop and Add: The instructor will follow University, College and Departmental guidelines for drops and adds. Important dates to drop and/or add classes can be seen in the syllabus attachment. Please, consult Ms. Helen Daggs in 202 ES if you need more information.

Academic Integrity: The instructor will strictly follow OSU's Academic Integrity Policy as stipulated in `http://academicintegrity.okstate.edu/`. Cheating on homeworks, quizzes or examinations, plagiarism and other forms of academic dishonesty are serious offenses and will subject the student to serious penalties.

Disability Impairment: If any member of the class feels that he/she has a disability and needs special accommodations of any nature whatsoever, the instructor will work with you to provide reasonable accommodations to ensure that you have a fair opportunity to perform in this class.