CE 4370 Course Syllabus

Course Information

Course Number/Section	CE 4370
Course Title	Embedded Microprocessor Systems
Term	2016 Fall
Days & Times	Monday and Wednesday 2:30– 3:45 PM
Meeting Place	ECSS 2.311

Professor Contact Information

Professor	William P. Swartz, Jr. , Ph.D.
Email Address	bill-swartz@utdallas.edu
Office Location	ECSN 3.610
Office Hours	Monday/Wed 4 – 5:30 PM and by appointment

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisite: CE/EE 3311, CE/EE 3320; Co-requisite: CE/EE 4304

Course Description

An introduction to microprocessors and their uses. Features commonly found in a CPU are discussed, such as: The Program Counter, Stack, Status Register, General Purpose Registers, ALU, Instruction Set and peripheral devices. Memory (SRAM, DRAM, EPROM, EEPROM) and Memory Mapped IO peripheral devices. Basic assembly and C language is used to create the binary machine code necessary to program a Microprocessor system. The special features of microprocessors: the stack, interrupts, input ports, out ports and display. Extensive laboratory work.

Student Learning Objectives/Outcomes

The following are the course learning objectives:

- **C001** Ability to understand Microprocessor Architecture
- **C002** Ability to understand Software Development for Microprocessors
- **C003** Ability to understand Analog and Digital Interfaces
- **C004** Ability to perform Application Development
- **C005** Ability to perform C & Assembly language programming

Required Textbooks and Materials

MSP430 Microcontroller Basics, Author: John H. Davies, Publisher: Newnes (September 4, 2008), ISBN: 0750682760

The Definitive Guide to the ARM Cortex-M3 (2nd Edition), Author: Joseph Yiu, Publisher: Newnes (December 23, 2009), ISBN: 185617963X

C Programming Language (2nd Edition), Authors: Brian W. Kernighan, Dennis M. Ritchie, Publisher: Prentice Hall (April 1, 1988), ISBN: 0131103628

Suggested Course Materials

MSP430 and ARM Cortex M3 &M4 data sheets and user guides (freely available on www.ti.com).

Assignments & Academic Calendar

Topics covered in the class include but not limited to:

- A general overview of MSP 430 and ARM Cortex M3
- Architecture, Instruction Set and Clock
- Software development in C and Assembly
- Polling and Interrupts
- Low Power Modes
- Digital I/O interfaces
- Timers
- Analog to Digital Converters (ADCs)
- Serial Communication (UART, SPI, I^2C)
- Memory caching
- Graphics Processing Units
- Symmetric Multiprocessing
- PicoBlaze Microcontroller

Homework Due Dates, Exam Dates

Homework will be due at the beginning of class unless otherwise announced via eLearning.
Video quizzes: Announced via eLearning
Midterms: Mon Oct 10, and Wed Nov 7, during class hours (tentatively)
Final examination: TBD

Grading Policy

Homework/Projects: 30%
Quizzes: 10%
Midterms: 30%
Final examination: 30% (cumulative)

Course & Instructor Policies

Make-up exams
Only by permission of the instructor BEFORE the regularly scheduled examination date
Extra Credit
Available for class participation especially at the whiteboard.
Late Work
Homework assignments will be considered late at 11:30 PM the Friday after they are due, and will not be graded without a valid excuse.
Class Attendance
Class attendance is required. Material presented in class will substantially augment the optional reading material in the text.
Rules for examinations
1. Seating is assigned randomly for each exam.
2. No materials except for writing instruments are allowed except for the last 10 minutes of the exam. A double-sided 8.5" x 11" sheet of formula cheat sheet will be allowed the last 10 minutes of the exam. Other materials such as books, notebooks and backpacks must be stowed away.
3. No calculators or electronic communication devices are allowed.
4. No questions are allowed during an examination. If you do not understand the statement of a problem, please state the problem that you think is meant, and solve it.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.