CLASS:	Microcontroller Systems and Interfacing	ELEC 74

INSTRUCTOR:	Jacob Christ jacob@pontech.com 714-269-7256 Cell (Call or Text okay)
OFFICE-HOURS:	7:00am – 8:00am in 28B-403, or by arrangement + I usually stay 30min after class.
CLASSROOM / TIME:	28B – 403, Th, 08:00am – 11:10am, 11:30am - 02:40pm
CLASS WEBSITE:	http://0process.com/mtsac/elec74/2020-spring/
COURSE DESCRIPTION:	This course emphasizes the software and hardware architecture for the Wiring Embedded API as implemented in a PIC Microcontroller environment. The software tools and hardware interface circuit design are covered for the microcontroller. Fundamentals circuits and terms are covered lectures and laboratory experiments by programming and interfacing to common circuits use in industry today.
MEASURABLE OUTCOMES:	Course measurable outcomes information can be obtained for this and all other Mt. SAC credit courses by visiting webcms.mtsac.edu, selecting the "Public Access" option, and using the pull-down menus to select the desired course.
PREREQUISITES:	ELEC 56 (Advisory)
CO-REQUISITES:	None
COURSE OBJECTIVES:	1. Program a PIC microcontroller using a development board.
	2. Compare and contrast various features of different process control circuits.
	3. Demonstrate the use of interfacing devices in circuit operation.
	4. Compare and contrast various features of different interfacing devices.
	5. Program the PIC using the C programming language.
	6. Demonstrate a functional interface control circuit for a process control circuit.
	7. Compare and contrast features of various types of PLDs.
REQUIRED MATERIALS:	Electronics 74 Instruction Notes and Lab Manual; Christ, Skoczen, Tsai, (and others)
	Microchip PIC32 Family Manual (and others) / Flash Drive
	One of the following two parts kits:
	MtSAC ELEC 74 Fubarino SD Development Kit (P/N: PLPA-0058-REV-D)
	MtSAC ELEC 74 Fubarino Mini Development Kit (P/N: PLPA-0176-REV-A)
OPTIONAL MATERIALS:	Arduino Cookbook by: Margolis, Michael
ATTENDANCE:	PER COLLEGE POLICY; IN THIS CLASS, THE STUDENT WILL BE DROPPED AFTER THE 3rd UNEXCUSED ABSENCE
METHOD OF EVALUATION:	50% - Labs (10 labs 5.0% each)
	10% - 2 Projects, 5% each
	20% - Mid Term (Written + Lab)
	20% - FINAL EXAM (Written + Lab, Comprehensive)
	100% (total)
GRADING SYSTEM:	Semester grade will be based upon student's percentage of points earned out of total possible points. Refer to scale below:
	A = [90% - 100%], B = [80%-90%)
	C = [60% - 80%), D = [50%-60%)
	F = [0%-50%)

STUDEN LEARNING OUTCOMES (SLO's):

Students completing ELEC 74 will be able to describe the relationship between hardware and software in a microcontroller. Students completing ELEC 74 will be able to install programs and development tools into microcontrollers or companion personal computers Students in ELEC 74 will use different types of microcontroller platforms (such as Arduino or Fubarino) to implement projects of their own design.

A complete list SLO's for the electronics department can be found here:

Week	Day	Topic
0x01	28-Feb	The Microcontroller and C Programming
0x01	28-Feb	Installing and Using Development Tools
0x02	6-Mar	Bits, Bytes & Data Types, Functions and Loops
0x02	6-Mar	Powering the Fubarino, Intro to Serial, Functions and Variables
0x03	13-Mar	Arrays, if-else, conditional, bitwise & logical operators, truth values
0x03	13-Mar	Digital Input - Conditional Statements
0x04	20-Mar	Asynchronous Serial Communications
0x04	20-Mar	Asynchronous Serial Communications
0x05	27-Mar	String Parsing
0x05	27-Mar	Serial Parser, String Manipulation & Libraries (Lab 5)
0x06	3-Apr	Strings and Pointers
0x06	3-Apr	Strings and Pointers (Lab 5 Continued)
0x07	10-Apr	ADC / Interfacing with analog electronic devices
0x07	10-Apr	ADC / Interfacing with analog electronic devices
0x08	17-Apr	Midterm Review / Lab Makeup
0x08	17-Apr	Midterm 1 / Project Proposal Due
0x09	24-Apr	Introduction to SPI /Digital Analog Converter
0x09	24-Apr	Introduction to SPI /Digital Analog Converter
0x0A	1-May	Introduction to C++
0x0A	1-May	Contributed Libraries and Custom Libraries
0x0B	8-May	Interfacing to SD Cards / USB Mouse / USB Keyboard
0x0B	8-May	File Systems and Reading and Writing Files
0x0C	15-May	Lab Makeup / Project Help
0x0C	15-May	Lab Makeup / Project Help
0x0D	22-May	Introduction to SPI/ LCD Display and Internal EEPROM
0x0D	22-May	Introduction to SPI/ LCD Display and Internal EEPROM
0x0E	29-May	Timers and PWM
0x0E	29-May	Timers and PWM
0x0F	5-Jun	Projects Due / Demonstrations
0x0F	5-Jun	Projects Due / Demonstrations
0x10	12-Jun	Final Exam (7:30am - 10am,)

Finals Week: June 8-12, 2020 (2020 Spring Final Exam Schedule)

https://www.mtsac.edu/schedule/finals/

TESTS WILL BE ANNOUNCED AT LEAST 1 WEEK IN ADVANCE ANY MISSED TEST MUST BE MADE UP BEFORE THE NEXT CLASS MEETING. QUIZZES ARE UNANNOUNCED AND MAY BE MADE UP WITH HALF CREDIT. THE ABOVE SCHEDULE IS NOTICE FOR THE TESTS, IF A TEST MOVES IT WILL BE ANOUNCED AT LEAST ONE WEEK PRIOR ORIGINAL DATE AND ONE WEEK PRIOR TO NEW DATE.