

EC511 - MICROCONTROLLERS AND APPLICATIONS

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Course Objectives:

- . To expose the students to the fundamentals of microcontroller based system design.
- . To understand I/O and RTOS role on microcontroller.
- . To Gain knowledge on PIC Microcontroller based system design.
- . To Learn Microchip PIC 8 bit peripheral system Design
- . To do case study experiences for microcontroller based applications

Course Learning Outcomes:

- . Design a 8051 microcontroller based embedded system
- . Design a PIC18F452 based system
- . Interface various peripherals to 8051

UNIT - I**8051 Architecture****(10 hours)**

Architecture – memory organization – addressing modes – instruction set – Timers - Interrupts - I/O ports, Interfacing I/O Devices – Serial Communication.

UNIT - II**8051 Programming****(12 hours)**

Assembly language programming – Arithmetic Instructions – Logical Instructions–Single bit Instructions – Timer Counter Programming – Serial Communication Programming -Interrupt Programming – RTOS for 8051 – RTOS Life – Full RTOS – Task creation and run .

UNIT - III**Picmicrocontroller(PIC18F452)****(10 hours)**

Architecture – memory organization – addressing modes – instruction set – PIC programming in Assembly & C –I/O port, Data Conversion, RAM & ROM Allocation, Timer programming, over view of MP-LAB IDE.

UNIT - IV**PERIPHERAL OF PIC MICROCONTROLLER****(10 hours)**

Timers – Interrupts, I/O ports- I2C bus-A/D converter-UART- CCP modules - ADC,DAC and Sensor Interfacing –Flash and EEPROM memories.

UNIT - V**Applications****(10 hours)**

Interfacing LCD Display – Keypad Interfacing -7 segment LED interfacing - Generation of Gate signals for converters and Inverters - Motor Control – Controlling AC appliances –Measurement of frequency - Stand alone Data Acquisition System.

TEXT BOOKS:

- 1.Muhammad Ali Mazidi, Rolin D. Mckinlay, Danny Causey ' PIC Microcontroller and Embedded Systems using Assembly and C for PIC18', Pearson Education 2008.
- 2.Kenneth J.Ayala,'The 8051 Microcontroller-Architecture, programming and Applications'.

REFERENCES:

- 1.John.B.Peatman,'Design with PIC microcontrollers', Pearson Education.
- 2.John Iovine, 'PIC Microcontroller Project Book ', McGraw Hill 2000
- 3.Myeke Predko, "Programming and customizing the 8051 microcontroller", Tata McGraw Hill 2001.