ECE310:FUNDAMENTALS OF MICROPROCESSORS AND MICROCONTROLLERS

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: describe the basics of Microprocessor 8085, its internal architecture and functioning

CO2 :: familiar about the architecture and organization of advanced processors

CO3 :: interpret different technique and methods to design a program for 8051 microcontroller

CO4 :: develop different programming methods using 8051

CO5 :: analyze different interfacing module using 8051 microcontroller

CO6 :: understand different interfacing modules using advanced processor ARM

Unit I

8085 Microprocessor architecture : RISC & CISC Architecture, 8085 pin diagram and block diagram, signal descriptions, timing and control unit, Timing diagrams, status flag

Unit II

8085 programming, 8086 and advanced processors : Addressing mode, Instruction set, Instruction type of 8085, 8086 architecture and pin diagram, register organization, Comparison of 8085 and 8086, power PC, introduction to system-on-a-Chip

Unit III

8051 Microcontroller Architecture : Microprocessor Vs Microcontroller, 8051 Architecture, Registers used, Pin diagram, I/O ports functions, Internal Memory organization

Unit IV

Instruction Set and it's Programming : Addressing Modes, Instruction set, Stack and Subroutine instructions, Assembly language program examples on subroutine and involving loops, Delay subroutine, Addition of 8 bit numbers, Interfacing simple switch and LED to I/O ports to switch on/off LED with respect to switch status

Unit V

Timers, Serial Port and interrupts : 8051 Timers and Counters, Operation and language programming to generate a pulse using Mode-1, 8051 Serial Communication, Basics of Serial Data Communication, RS-232 standard, 8051 interrupts and its programming

Unit VI

Advanced processors (ARM) : embedded system software and hardware, ISA's and ARM history

Futuristic microprocessor technologies : low-power microprocessor design for IoT devices, introduction to edge computing and Microprocessor requirements for edge devices

Text Books:

1. MICROPROCESSOR, ARCHITECTURE, PROGRAMMING, & APPLICATIONS WITH THE 8085 by RAMESH. S. GAONKAR, PENRAM INTERNATIONAL PUBLISHING (INDIA) PVT. LTD.

References:

1. THE 8051 MICROCONTROLLERS AND EMBEDDED SYSTEMS by MUHAMMAD ALI MAZIDI AND JANICE GILLISPIE MAZIDI, PEARSON

2. . THE 8051 MICROCONTROLLER ARCHITECTURE, PROGRAMMING AND APPLICATIONS by KENNATH J. AYALA., CENGAGE LEARNING

3. ARM SYSTEM-ON-CHIP ARCHITECTURE by STEVE FURBER, PEARSON