EMBEDDED SYSTEMS-I
(Common to CSE & IT)

Course Code: 15CT1117

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Pre-requisites:

Electronics Devices and Circuits,Computer Organization

Course Outcomes :

At the end of the Course, the Student will be able to:

CO 1 Understand the INTEL 8051 architecture and instruction set.

CO 2 Understand the INTEL 8051 peripheral devices and external devices interfacing, Write programs in assembly and C language for real time problems

CO 3 Understand the ATMEGA 8535 architecture , instruction set

CO 4 Understand the ATMEGA 8535 peripheral devices and external devices interfacing

CO 5 Understand the serial communication buses

UNIT-I **(12 Lectures)**

INTEL 8051 MICRO CONTROLLER:

Microcontrollers and embedded processors, Introduction to Classic 8051 family Architecture, Von Neumann Architecture and Harvard architecture, Address and data bus with multiplexed I/O pins. Addressing modes, instruction set, I/O programming and other application programming in Assembly and C language.
(Text book-1)

UNIT-II **(12 Lectures)**

PERIPHERALS AND INTERFACING:

Timers, Counters and their mode of operations programming, serial port programming ,Interrupts. Hardware Connection and Hex File,

LCD and key board Interfacing and their programming. Motor Control (Text book-1)

UNIT-III (10 Lectures)

ATMEGA 8535:

Overview of AVR family, AVR Microcontroller architecture, Register, AVR status register, ROM space and other hardware modules. Addressing modes of AVR, Data transfer Arithmetic, Logic and Compare, Rotate and Shift, Branch and Call instructions. AVR assembly language programs, Time delay loop, BCD, ASCII conversion Program, Look-up table, Bit addressability, MACROs. (Textbook-2)

UNIT-IV (8 LECTURES)

PERIPHERAL SYSTEMS IN ATMEGA 8535:

(a) Digital Input and Output Programming,

(b) Timers and Counters and their programming

(c) Capture Control and PWM and their programming

(d) Analog to Digital Converters and their Programming (Text book-2)

UNIT-V (8 Lectures)

SERIAL COMMUNICATION BUSSES WITH ATMEGA 8535

(a) USART, with addressable communication feature

(b) SPI bus, ants speed and versatility

(c) 12c {Inter Integrated Circuit bus} the two wire communication bus. (Text book-2)

TEXT BOOKS:

1. Ali Mazidi Mohammed Gillispie, Mazide Janice, "The 8051Microcontroller and Embedded Systems using assembly & C", 2nd Edition, Pearson Education, 2009

2. Muhammad Ali Mazidi, SarmadNaimi and SepehrNaimi" The AVR Microcontroller and Embedded Systems Using Assembly and C", 1st Edition,Pearson Education, 2011.

REFERENCES:

1. BendapudyKantaRao, “Embedded Systems”, 1st Edition, Prentice Hall India, 2011.
2. Kenneth J Ayala, “The 8051 Micro Controller”, 3rd Edition, Thomson Publishers, 2009.