EMBEDDED SYSTEM

Paper Code	**CEN-706**
Course Credits	**4**
Lectures / week	**3**
Tutorial / week	**1**
Course Description	**UNIT – I**

Embedded system:- Definition, components, I/O, Processor, Memory, Characteristics, attributes, design metrics , design challenges, application areas, Issues of designing efficient Embedded system, Difference between ES and PC, Design Technology, Integration and Testing of Embedded Hardware and Firmware, Embedded System Development Environment:-IDE, compiler, assembler, simulator, Emulator, debugging, Target hardware debugging and Boundary Scan , EDLC, Trends in the Embedded Industry:-Processor trends, OS trends, Development languages trends, Open Standard and framework.

UNIT- II

Microcontroller:-Introduction, criteria for choosing a microcontroller**,** Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, Memory Organization of 8051,SFR, Addressing Modes, Instruction set including bit manipulating instruction and programming using it, Subroutine, Stack, Time delay generations and calculations, I/O port programming, Programming of 8051 Timers, Counter Programming. Watch Dog Timer, Real Time clock.

UNIT- III

8051 hardware connections, basics of Communication with 8051**,** Basics of Communication, Overview of RS-232, I^2C Bus, UART, USB, 8051 connections to RS-232, 8051 serial communication programming, 8051 interrupts, Programming of timer interrupts,

Programming of External hardware interrupts, Programming of the serial communication interrupts, Interrupt priority in the 8051

UNIT- IV

Basic Concepts of Interfacing, Introduction8051 Interfacing to an external memory and Accessing External data Memory and External Code Memory, Interfacing to LCD/Keyboard, DAC/ADC, Sensors, a Stepper Motor, Interfacing with 8255

UNIT – V

S/W H/W Co-design. RTOS:- introduction, type, overview of commercially available RTOS, Introduction to ES design using RTOS ., Soc, NOC, Introduction to Arm , Pic, and AVR Processors and other recent processors

References / Text Books:

- Shibu K V , "Introduction to Embedded Systems" , TMH 2009
- M.A. Mazidi and J. G. Mazidi, "The 8051 Microcontroller and Embedded Systems", PHI, 2004
- Frank Vahid & Tony Givargis, "Embedded System Design ", John Wiley & sons , 2002
- David E. Simon, "An Embedded Software Primer", Pearson Education, 1999.
- Raj Kamal, "Embedded Systems", TMH, 2004.
- K.J. Ayala, "The 8051 Microcontroller", Penram International, 1991.
- Dr. Rajiv Kapadia, "8051 Microcontroller & Embedded Systems", Jaico Press
- Dr. Prasad, "Embedded Real Time System", Wiley Dreamtech, 2004.
- Wayne Wolf, "Computers As Components , Principle of Embedded Computing System Design" , Morgan Kauf man

Computer Usage /

Software Requires: Publishers, 2008.