EMBEDDED SYSTEM DESIGN

Paper Code	**ECS-703**
Course Credits	4
Lectures/ Week	3
Tutorials/ Week	1
Course description	**UNIT- 1** Definition, Characteristics of Embedded Systems, Design Challenge-optimizing design metrics, Performance of design metrics, Example of a Digital Camera chip. **UNIT- II** 8051 Architecture, Programming model of 8051, Pin diagram of 8051,8051 oscillator and clock, Program counter and data pointer flags and Program status word (PSW), Internal memory, Internal RAM, Special function registers. **UNIT- III** Microcontroller Vs General Purpose Microprocessor, Microcontroller for embedded systems, X86PC embedded applications, 8051 Assembly language Programming, Assembling and Running 8051 program, Machine code in program, 8051 Flag bits and PSW, 8051 registers banks and stack, jump, loops, Logic and call instructions, Design from various 8051 chips, Delay Calculations. **UNIT-IV** I/O ports and programming, I/O bit manipulation program, 8051 programming in C, I/O programming in C, Addressing SFR, Logic operations in C, Data serialization 8051C. **UNIT-V** Connecting 8051 to 8255 motor control, Motor control: Stepper Motor interfacing, Controlling Stepper Motor via opt isolator
Pre-requisite	
Course/Paper:	Basic knowledge of digital logic required but not mandatory.

Text Book:	Mohd. Ali Mazidi, JC Mazidi and Mc Kinlay, “The 8051 microcontroller and Embedded system- using Assembling and C”, Pearson 2008.
Reference Books:	1.Frank Vahid and Tony Givaris, “Embedded System”, Willy India 2002. 2. Rajkamal,“Embedded systems: architecture, programming and design”, Tata McGraw-hill 2008.
Course outcomes:	**CO1:** Thorough understanding of Embedded System and its characteristics, differences between Microprocessor and Microcontroller and optimization of Design Metrics for an Embedded System. **CO2:** Understanding of architecture, Internal memory, Special function registers, Programming model and pin structure of 8051 microcontroller. **CO3:** Thorough understanding of loop, jump, call instructions, various Addressing Modes, arithmetic and logic instructions in 8051, Ability to program 8051 in Assembly Language. **CO4:** Ability to program 8051 microcontroller using Embedded C. **CO5:** Capability to program 8051 timers to generate time delays and counter operations, understanding of 8051 interfacing with LCD, stepper motor and 8255 chip.
Computer usage:	Assembly & C programming.
Software required:	