Course Number and Name
BEE027 & Microcontroller Based System Design

Credits and Contact Hours
3 & 45

Course Coordinator's Name
Mr.K.S.Prasad

Text Books and References

Text Books:
1. Sriram. V.Iyer & Pankaj Gupta, "Embedded real time systems Programming", Tata McGraw- Hill, 2007.
2. Muhammad Ali Mazidi, Rolin D. Mckinlay, Danny Causey ' PIC Microcontroller and Embedded Systems using Assembly and C for PIC18', Pearson Education 2008 .
3. John Iovine, 'PIC Microcontroller Project Book ', McGraw Hill 2000

References:
1. Rajkamal, "Embedded system-Architecture, Programming and Design", 2nd edition Tata McGraw-Hill, 2003.
2. John H. Davies, "MSP430 Microcontroller Basics", Newnes publishers, First edition, 2008.
3. Rafiquzzaman.M, "Microcontroller Theory and Applications with the PIC18F", Wiley 2011.
4. http://nptel.ac.in/courses/Webcourse-contents/IIT-KANPUR/microcontrollers/micro/ui/Course_home1_1.htm

Course Description
To expose the students to the fundamentals of microcontroller based system design

Prerequisites	Co-requisites
Microprocessor and Microcontroller	Nil

required, elective, or selected elective (as per Table 5-1)
Required

Course Outcomes (COs)

CO1:Understand the basics of embedded system

CO2:Understand about Hardware/software co-design aspects and analyse the requirements for interfacing

CO3:Understand concepts of ARM Processor and programming them.

CO4:Understand concepts of PIC controller and programming them.

CO5:Analyse and implement various interfacing circuits necessary for various applications

Student Outcomes (SOs) from Criterion 3 covered by this Course											
COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	M		M	M	M	M			M		M	M
CO2	M		M	M	M	M			M		M	H
CO3	M		M		M	H			M		M	M
CO4	M		M		M	M			H		M	M

CO5	M		H	M	H	M			H		H	H	

List of Topics Covered

UNIT I   EMBEDDED SYSTEMS   9
Introduction to embedded systems – hardware and software components –types- examples- characteristics –system on chip-challenges in embedded computing system design – embedded system design process.

UNIT II   EMBEDDED SYSTEM INTERFACING   9
Serial and parallel communication devices-wireless devices – timer & counting devices-Watch dog timer – Serial communication using I2C- CAN USB buses –Parallel Communication using ISA- PCI- PCI/X buses-wireless and mobile system protocol.

UNIT III   ARM PROCESSOR-7   9
MSP430 architecture-addressing modes-constant generator and emulsion instructions-instruction set, functions- interrupts low power modes.

UNIT IV   PIC CONTROLLER   9
PIC microcontrollers: History and features –Architecture – memory organization – addressing modes – instruction set – PIC progrmming –I/O port, Data Conversion, RAM & ROM Allocation.

UNITV   INTERFACING – CASE STUDY   9
Interfacing PIC to LCD – Keyboard– parallel and serial ADC, DAC– Stepper motor interfacing