20EC2701A - EMBEDDED AND REAL TIME SYSTEMS

Offering Branches	ECE		
Course Category:	Open Elective -III	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisites:	-	Continuous Evaluation:	30
		Semester End Evaluation:	70
		Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1	**Apply** design methodologies for embedded systems.	K3
CO2	**Build** embedded systems with specifications and technological choice.	K3
CO3	**Develop** fundamental systems such as sensors, actuators, converters, processors, intra- and inter-communication networks and interfaces.	K3
CO4	**Utilize** modern hardware/software tools for building prototypes of embedded systems.	K3

Contribution of Course Outcomes towards achievement of Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									2			2	2
CO2	2									2			2	2
CO3	3									3			3	3
CO4	2									2			2	2
Avg.	**2**	**2**								**2**			**2**	**2**

1- Low **2-Medium** **3-High**

Course Content

UNIT-1	**Introduction:** History of Embedded Systems, Major Application Areas of Embedded Systems, Purpose of Embedded Systems, Core of the Embedded System, Sensors and Actuators, Communication Interface, Embedded Firmware.	CO1
UNIT-2	**Hardware Software Co-Design And Programme Modeling:** Characteristics of an Embedded System, Quality Attributes of Embedded Systems, Fundamental Issues in Hardware Software Co-Design, Computational Models in Embedded Design, Hardware Software Trade-offs.	CO2
UNIT-3	**Devices in Embedded Systems:** Types of supporting devices for an embedded system – various forms of ROM, RAM devices, interrupt sources, Interrupt Service Mechanism, serial port devices, parallel port devices, timers and counting devices.	CO3
UNIT-4	**Communication Buses for Device Networks:** Interfacing Features in Device Ports, Wireless Devices, Networked Embedded Systems, Serial Bus Communication Protocols, Parallel Bus Device Protocols- Parallel Communication Network Using ISA, PCI, PCI-X andAdvanced Buses.	CO3
UNIT-5	**Design of Real Time Systems:** processors in complex embedded systems, design process in embedded system, optimizing design metrics, Case study for adaptive cruise control system in car.	CO4

Learning Resources

Text Books	1. Embedded Systems Architecture, Programming and Design- Raj Kamal, SecondEdition, McGrawHill Education. 2. Introduction to Embedded System- Shibu KV, Mc-Graw Hill Edition.
Reference Books	1. Peckol, "Embedded system Design",JohnWiley&Sons,2010 2. Lyla B Das," Embedded Systems-An Integrated Approach",Pearson,2013 3. Embedded/Real-Time Systems, Dr. K.V.K.K. Prasad, dream Tech press