

EMBEDDED SYSTEMS

Course Code	20EE4702D	Year	IV	Semester	I
Course Category	Professional Elective -IV	Branch	EEE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	MP&MC
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	Discuss the methodologies of embedded systems (L2)
CO2	Assess the basic knowledge on building blocks, development Tools for the application in embedded systems. (L3)
CO3	Examine the basics of real time operating system, processor scheduling algorithms, different phases and modeling of embedded system. (L3)
CO4	Identify the buses and software tools required to build embedded systems. (L4)
CO5	Determine the operating system, scheduling algorithms, different phases involved in developing the embedded system applications. (L4)
CO6	Ability to do various applications in embedded systems and submit a report.

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														
CO2	3		1										2	1
CO3	3					1		1					2	1
CO4		3		1	1		1					1	2	1
CO5		3					1						2	1
CO6									3	3	1			

Syllabus		
Unit No.	Contents	Mapped CO
I	Introduction to Embedded Systems: Embedded systems vs general computing systems, history of embedded systems, classification of embedded systems, major application of embedded systems, purpose of embedded systems, elements of an embedded systems, core of the embedded systems, memory.	CO1 CO2 CO4 CO6
II	Communication Buses in Embedded Systems: On board communication interfaces: I2C, SPI bus, 1 Wire bus, parallel interface, External Communication interfaces:RS232, RS485, USB, IEEE 1394 firewire bus, Bluetooth, Wi-Fi, Zigbee, GPRS, GSM.	CO1 CO2 CO4 CO6
III	Embedded system Development Tools: Software Development environment-IDE,Types of files generated on cross-compilation, Dissembler/Decompiler, simulators, emulators, debugger, target hardware debugging, hardware-software co-design	CO1 CO2 CO4 CO6

IV	Introduction to Real-Time Operating Systems: A brief history of operating systems, defining an RTOS, the scheduler, introduction to task, task states and scheduling, round-robin scheduling algorithm, co-operative scheduling algorithm, pre-emptive scheduling algorithm, Introduction to semaphores.	CO1 CO3 CO5 CO6
V	Embedded system application development: Objectives, different phases and modeling of the embedded product development life cycle (EDLC), case studies on smart card, adaptive cruise control in a car, mobile phone software for key inputs.	CO1 CO3 CO5 CO6

Learning Resources

Text Books:

1. Shibu.K.V, "Introduction to Embedded Systems", Tata McGraw Hill, 2nd Edition,2017
2. Rajkamal, 'Embedded System-Architecture, Programming, Design', TMH 3rd Edition, 2017.

Reference Books:

1. Peckol, "Embedded system Design", JohnWiley&Sons,2nd Edition, 2019.
2. Lyla B Das," Embedded Systems-An Integrated Approach", Pearson, 1st Edition, 2013.

E-Resources:

1. <https://nptel.ac.in/courses/106105159>
2. <https://nptel.ac.in/courses/108102045>