Subject Name: Embedded System

Subject Code: CE 704-2 / IT 704-2

Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
04	00	02	06	5	3	70	30	20	30	150

Learning Objectives:

To learn the concepts of Embedded System and implement these concepts into practice.

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Introduction	10
2	Memory and Input Management	15
3	Processes and Operating System	15
4	Embedded Software	20

Total hours (Theory): 60

Total hours (Lab): 30

Total hours: 90

Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weight age(%)
1	**Introduction** Challenges of Embedded Systems, Embedded system design process, Embedded System processors & Micro controllers, ARM, PIC architecture	10	20
2	**Memory and Input Management** Common memory types, Memory hierarchy, Cache Memory, Memory system mechanisms, Memory and I/O devices and interfacing, Interrupts handling	15	25
3	**Processes and Operating System** Multiple tasks and processes, Context switching, Scheduling policies, Inter process communication mechanisms, Performance issues, Introduction to RTOS, Process management & memory management in RTOS along with Real time scheduling	15	25
4	**Embedded Software** Programming embedded systems in assembly and C, Meeting real time constraints, Arduino Uno and its programming, Embedded C Programming, Introduction to Raspberry Pi and programming	20	30
	Total	**60**	**100**

Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Reference Books:

1. Computers as Components: Principles of Embedded Computing System Design, Wayne Wolf, 2nd Edition, Morgan Kaufmann Publishers
2. Embedded System Design: A Unified Hardware Software Approach, Frank Vahid and Tony Givargis
3. Michael J. Pont, "Embedded C", Pearson Education , 2007

List of Practical:

Sr. No	Title
1	To print Hello World using Embedded C.
2	To implement operators in Embedded C.
3	To implement conditional statements and loop in Embedded C.
4	To implement the concept of port programming using Embedded C.
5	To display decimal numbers from 0-9 in the seven segment display.
6	To blink an LED.
7	To prepare digital clock.
8	To implement functions of Arduino board.
9	Controlling home appliances using Arduino board.
10	To design embedded system using Raspberry Pi programming