Devi Ahilya University, Indore, India Institute of Engineering & Technology				ME – I Year (Spl Digital Communication) Semester- A			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
DCP2E3 **Embedded RTOS**	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	3	**1**	**0**	**3**	**1**	**0**	**4**
Duration of Theory Paper: 3 Hours							

Objective: provide an understanding of general embedded system concept, Embedded Software development, RTOS essentials, advantages and trade-offs. It will provide practical experience necessary to use an RTOS in an embedded system development

Prerequisites : Opertaing system, Microcontrollers and C Programming

COURSE CONTENTS

UNIT – I:

Introduction

Introduction to UNIX/LINUX, Overview of Commands, File I/O (open, create, close, lseek, read, write), Process Control (fork, vfork, exit, wait, waitpid, exec).

UNIT - II:

Real Time Operating Systems

Brief History of OS, Defining RTOS, The Scheduler, Objects, Services, Characteristics of RTOS, Defining a Task, Tasks States and Scheduling, Task Operations, Structure, Synchronization, Communication and Concurrency. Defining Semaphores, Operations and Use, Defining Message Queue, States, Content, Storage, Operations and Use

UNIT - III:

Objects, Services and I/O

Pipes, Event Registers, Signals, Other Building Blocks, Component Configuration, Basic I/O Concepts, I/O Subsystem

UNIT - IV:

Exceptions, Interrupts and Timers

Exceptions, Interrupts, Applications, Processing of Exceptions and Spurious Interrupts, Real Time Clocks, Programmable Timers, Timer Interrupt Service Routines (ISR), Soft Timers, Operations.

Embedded Firmware:

Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer, Embedded Firmware Design Approaches and Development Languages.

UNIT - V:

Case Studies of RTOS

RT Linux, MicroC/OS-II, Vx Works, Embedded Linux, Tiny OS, and Basic Concepts of Android OS.

Books Recommended:

[1]. Real Time Concepts for Embedded Systems – Qing Li, Elsevier, 2011
[2]. Embedded Systems- Architecture, Programming and Design by Rajkamal, 2007, TMH.
[3]. Advanced UNIX Programming, Richard Stevens
[4]. Embedded Linux: Hardware, Software and Interfacing – Dr. Craig Hollabaug