Devi Ahilya University, Indore, India Institute of Engineering & Technology				**IV Year B.E. (Electronics and Telecommunication Engg.)**			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
7ETRC2 OPERATING SYSTEM	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	3	**1**	**0**	**3**	**1**	**0**	**4**
Duration of Theory Paper: 3 Hours							

Course Learning Objective:

The course contents are aimed to provide:

- Students will learn how Operating System is Important for Computer System.
- To make aware of different types of Operating System and their services.
- To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
- To know virtual memory concepts.
- To learn secondary memory management

Prerequisites: Basic knowledge of Data Structures and Computer Organization.

COURSE CONTENTS

UNIT-I

Introduction: Role of OS: Types of OS, Batch Systems; Multiprogramming; Time Sharing; Distributed & Real time OS. Computer structure and OS: System Architecture – I/O, Storage, Processors; System components- OS Services, System Calls , System Programs; System Design, Implementation and Generation.

UNIT-II

Process Management: Concepts of process: Process status, Process description, Process model. Process Scheduling: Concepts, Scheduler organization, preemptive and non-preemptive scheduler strategies, scheduling algorithms: FCFS, SJN, Priority Scheduling, Round Robin Scheduling, Multiple Processor scheduling, Thread Concepts and Multiple threaded OS.

UNIT-III

Process Synchronization and Deadlock: Process Co-operation, Concepts of Inter-process communication, Process Synchronization, Synchronization Issues, Critical Section problem, Mutual exclusion Primitives and Algorithms, Process Synchronization with semaphores. Concepts of Deadlock, Conditions for Deadlocks, Resource Concepts & Abstractions, Deadlock Prevention, Avoidance and Recovery, Banker Algorithms for Deadlock Avoidance.

UNIT-IV

Memory Management and File system: Paging, Segmentation and Contiguous memory allocation. Virtual Memory: Demand Paging, Page replacement and Frame Allocation policies, Thrashing. File System: Concepts, Access Method, Directory Structure, and File System Management.

UNIT-V

Disk management and other issues: Disk management: Disk Structure and Scheduling. File systems, and operating system support for distributed systems. Protection and Security related issues. Case studies of contemporary operating systems.

Course Outcomes (COs):

After completing this course, students will be able to:

CO No.	CO	PO
CO1	Understand different types of operating systems and their services.	PO-1, PO-2
CO2	Implement and analyze process scheduling and synchronization techniques.	PO-3, PO-4
CO3	Apply deadlock handling techniques for resource management.	PO-1, PO-5
CO4	Demonstrate memory management techniques such as paging and segmentation.	PO-2, PO-3
CO5	Evaluate disk management strategies and OS security issues.	PO-6, PO-9

CO-PO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO1	3	2										
CO2			3	2								
CO3	3				2							
CO4		3	2									

CO5						2			3			

BOOKS RECOMMENDED:

[1]. Silberschatz, Galvin and Gagne, Operating System Principles, 7th Ed. Addison Wesley. [2]. Gary Nutt, Operating Systems, 3rd Ed. Pearson Education, India
[3]. Tanenbaum, Modern Operating Systems,
PHI. [4]. W. Stalling, Operating Systems,
Macmillan.
[5]. H. M. Dietel, Operating Systems, Addison Wesley Longman.
[6]. Maurice J. Bach, The design of Unix Operating system, Pearson Education, India.
[7]. Sumitabha Das, Unix Concepts & Applications: includes SCO UNIX & Linux, Tata McGraw Hill.