

Devi Ahilya University, Indore, India Institute of Engineering & Technology				II Year B.E. (Computer Engg.) (Full Time)			
Subject Code & Name	Instructions Hours per Week			Credits			
CER4C2 Operating Systems	L	T	P	L	T	P	Total
Duration of Theory Paper: 3 Hours	3	1	2	3	1	1	4+1(P)

Learning Objectives: To provide an introduction to Operating System concepts and its design issues.

Pre-requisites: 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.

Learning Outcomes: To learn operating System concepts and its design issues.

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.