

| Devi Ahilya University, Indore, India Institute of Engineering & Technology | | | IV Year B.E. (Electronics and Telecommunication) | | | | |
|--|--|----------|---|----------------|----------|----------|--------------|
| Subject Code & Name | Instructions Hours per Week | | | Credits | | | |
| ETR7C2 OPERATING SYSTEM | L | T | P | L | T | P | Total |
| | 3 | 1 | 0 | 3 | 1 | 0 | 4 |
| Duration of Theory Paper: 3 Hours | | | | | | | |

Learning Objectives:

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.

Learning Outcomes:

Upon Completing the Course, Student will able to learn:

- Understands the different services provided by Operating System at different level.
- They learn real life applications of Operating System in every field.
- Understands the use of different process scheduling algorithm and synchronization techniques to avoid deadlock.
- They will learn different memory management techniques like paging, segmentation and demand paging etc.

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.