

Vidyalankar

S.E. Sem. IV [CMPN]
Operating System

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Practical & Oral : 25 Marks

1. Operating System Overview :

Operating system objectives and Functions. Evolution of Operating systems, Characteristics of Modern Operating Systems, Basic Concepts: Processes, Files, System calls, Shell, Layered structure v/s Monolithic Structure of Operating System. Introduction to distributed OS, RTOS, Mobile OS.

2. Process and process scheduling :

Process description, PCB, Threads, Thread management; process and thread, Process scheduling : Types, comparative assessment of different scheduling algorithms.

3. Process Concurrency :

Principles of Concurrency; Mutual Exclusion – Hardware approaches; Mutual Exclusion - software support, Semaphores; Monitors, Message Passing; Readers/Writers Problem. Deadlock and starvation: Principles of Deadlock, Deadlock Prevention; Deadlock Avoidance, Deadlock Detection, An Integrated Deadlock Strategy; Dining Philosophers problem.

4. Memory Management :

Memory management Requirements. Memory Partitioning; Virtual memory; Paging, Segmentation; Design and implementation issues in paging and segmentation; page replacement algorithms; page fault handling; working set model.

5. I/O Management and Disk Scheduling :

I/O Devices. Organization of the I/O Function; Operating System Design Issues; I/O Buffering, Disk Scheduling and disk scheduling algorithms; RAID; Disk cache.

6. File Management.

Overview; File Organization; File Directories; File Sharing; Record Blocking; Secondary Storage Management; UNIX File system.

7. Case Studies :

Overview of Linux operating system, Process and thread management Scheduling, concurrency control mechanisms, Memory management and I/O management in Linux.

Overview of Windows operating system: Process and thread management, Scheduling, concurrency control mechanisms, Memory management and I/O management in windows.

References :

1. "Operating Systems" (*William Stallings*) 4th Edition, Pearson Education.
2. "Operating Systems Principles" (*Silberschatz A., Galvin P., Gagne G.*) Willey
3. "Understanding Operating Systems" (*Flynn Ida M., McHoes A.M.*) 4th Edition, Thomson.
4. "Modern Operating Systems" (*Tammembaum*) PHI
5. "Operating System" (*Milan Milenkovic*) Tata McGraw Hill
6. "The Design of the Unix Operating System" (*Maurice J. Bach*) Prentice Hall.

