

Course Topics:

Unit-I:

Computer System Structures. Operating System Structure- System Components, System Calls. Processes- Process Scheduling, Operation on Processes, Cooperating Processes. Threads. Scheduling- Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling. Real-Time Scheduling. Process Synchronization- The Critical-Section Problem, Semaphores, Classic Problems of Synchronization, Monitors.

Unit-II

Deadlocks- System Model, Deadlock Characterization, Methods for Handling Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Starvation.

Memory Management- Swapping, Contiguous Memory Allocation, Paging, Segmentation, Segmentation with paging. Virtual Memory- Demand Paging, Page Replacement, Allocation of Frames, thrashing.

Unit-III

File-System Interface and Implementation- File Concept, Directory Structure, Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery. I/O Systems- I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O to Hardware Operations, STREAMS, Performance. Mass Storage Structure- Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, RAID Structure, Disk Attachment, Stable-Storage Implementation, Tertiary-Storage Structure. Protection and Security. A case study of modern operating systems

Text books:

1. “Operating System Concepts”, 6th ed., Silberschatz-Galvin-Gagne, John Wiley & Sons.
2. “Operating System: A Modern Perspective”, 2nd ed., Garry Nutt, Pearson Education.