

(CS2203PC) OPERATING SYSTEMS

Course Objectives:

- Introduce operating system concepts (i.e., processes, threads, scheduling, synchronization, dead locks, memory management, file and I/O subsystems and protection).
- Introduce the issues to be considered in the design and development of operating system.

Course Outcomes:

- Will be able to control access to a computer and the files that may be shared
- Demonstrate the knowledge of the components of computer and their respective roles in computing.
- Ability to recognize and resolve user problems with standard operating environments.
- Gain practical knowledge of how programming languages, operating systems and architectures interact and how to use each effectively.
- Ability to handle files and their techniques .

UNIT- I

Operating System- Introduction, Structures- Simple Batch, Multi programmed, Time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating System services, System Calls

UNIT - II

Process and CPU Scheduling-Process concepts and scheduling, Operations on processes, Cooperating Processes, Threads, and Interposes Communication, Scheduling Criteria, Scheduling Algorithms, Multiple –Processor Scheduling. System call interface for process management- fork, exit, wait, waitpid, exec

UNIT - III

Dead locks- System Model, Dead locks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock Process Management and Synchronization-The Critical Section Problem, Synchronization Hardware, Semaphores and Classical Problems of synchronization, Critical Regions, Monitors Interprocess Communication Mechanisms: IPC between processes on a single computer system, IPC between processes on different systems, using pipes, FIFOs, message queues, shared memory.

UNIT - IV

Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, PageReplacement, Page Replacement Algorithms.

UNIT - V

File System Interface and Operations-Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free- space Management.Usage of open, create, read, write, close, lseek, stat, ioctl systemcalls.

TEXT BOOKS:

1. Operating System Principles-Abraham Silberchatz, Peter B.Galvin, Greg Gagne, 7 th Edition, JohnWiley
2. Advanced programming in the UNIX environment, W.R.Stevens, Pearson education.

REFERENCE BOOKS:

1. Operating Systems-Internals and Design Principles Stallings, Fifth Edition- 2005,Pearson Education/PHI
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems,Andrew S.Tanenbaum, 2 nd edition, Pearson/PHI
4. UNIX programming environment, Kernighanand Pike, PHI/Pearson Education
5. UNIX Internals-The New Frontiers, U.Vahalia, Pearson Education.