MCA 203 Operating Systems

Module 1 (10 Hours)

Operating System Introduction- Functions, Characteristics, Structures - Simple Batch, Multi programmed, timeshared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating-System services, System Calls, Virtual Machines. Process and CPU Scheduling - Process concepts and scheduling, Operation on processes, Cooperating Processes, Threads, and Interposes Communication Scheduling Criteria, Scheduling Algorithm, Multiple -Processor Scheduling, Real-Time Scheduling.

Module 2 (10 Hours)

Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging. Demand Paging, Performance of Demanding Paging, Page Replacement, Page Replacement Algorithm, Allocation of Frames, Thrashing.

Module 3 (10 Hours)

File System Interface and Implementation -Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management, Directory Management, Directory Implementation, Efficiency and Performance. Process Management and Synchronization - The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors.

Module 4 (10 Hours)

Deadlocks - System Model, Dead locks Characterization, Methods for Handling Deadlocks Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock. I/O Management – I/O software and its types, Disk Scheduling. Shell Programming: Concept of shell, Types of shell, Editors for shell programming (e.g. vi), basics of Shell programming. Case Study- UNIX, LINUX, and Windows NT.

Module 5 (6 Hours)(as per choice of faculty)

Portion covered can be tested through Internal evaluation only not to be included in University examination)

Text Books

1. Silberschatz& Galvin: Operating System Concept, Wiley, Latest Edition.

2. Milan Milenkovic: Operating Systems, Tata McGraw – Hill, Latest Edition.

3. William Stallings: Operating Systems, PHI, Latest Edition.

Reference Books

1. YashawantKanetkar: Unix Shell Programming, BPB.

2. A.S. Tanenbaum: Modern Operating Systems, latest edition Pearson/PHI.

3. Dhamdhere: Operating Systems, Tata McGraw Hill.

4. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time