

BSc (IT)

DSC-11: OPERATING SYSTEMS (L:T:P::4:0:2)

6 Credits

Unit 1: Introduction

Definition of Operating System, Need, Early systems, Simple monitors, Batch Systems, Multiprogramming, Time Sharing, Real time, Parallel and Distributed systems. Special Purpose Systems: Real Time Embedded Systems, Multimedia Systems, Handheld Systems. Computing Environments – Traditional, Client Server, Peer-to-Peer and Web based. Open Source Operating Systems. Process Management: Process concept – meaning of process, sequential and concurrent processes, process state, process control block, threads, Process scheduling – scheduling queues, schedulers, contextswitch. Operations on Processes: creation and termination.

Unit 2: Processor Management

Processor -CPU I/O burst cycle, CPU Scheduler, Preemptive scheduling, dispatcher. Scheduling criteria, Scheduling algorithms: First-Come-First-Served (FCFS), Shortest Job First (SJF), Priority Scheduling, Round Robin. Multi-level queue scheduling (Concepts only), multi-level feedback queue scheduling (Concepts only). Multiple processor scheduling, Real time scheduling.

Unit 3: Deadlock and I/O scheduling

Deadlocks: Definition with example, System model, Dead lock characterization – Necessary Conditions Resource Allocation Graph, methods for handling deadlocks, Dead lock prevention, Avoidance and detection, Recovery from deadlock.

Unit 4: Memory Management

Main Memory: Swapping, contiguous memory allocation, segmentation, paging, structure of the page table, Example.

Virtual Memory: Demand Paging, copy-on-write, page replacement, allocation of frames, thrashing, memory mapped files, allocating kernel memory.

Text Books:

1. Operating System Concepts, Abraham Silberschatz and Peter Baer Galvin, Fifth edition, Addison - wesley 1989.
2. Operating Systems, Stallings, Pearson Edition.