MSCS201 OPERATING SYSTEM (3-0-0)

Module I: 9 Hours

Introduction: concept of operating system, types of OS, OS services, System calls and their types, system structure of operating system.

Process Management: process concepts, states, PCB, types of schedulers, operations on process, inter-process communication, concept of buffering

Module II: 9 Hours

Thread overview, user & kernel threads, multi-threading models, issues with multi-threading; CPU Scheduling: scheduling criteria, scheduling algorithms: FCFS, SJF, SRTF, RR, Priority Scheduling, MLQ, and MLQ with Feedback Scheduling.

Critical Section Problem, Solution to Critical Section problem, Dekker's Algorithm, Peterson Algorithm, synchronization hardware

Module III: 9 Hours

Semaphores; Classical problems of synchronization: Bounded-Buffer problem, Readers-Writers Problem, Dining-Philosophers Problem

Deadlock: characterization, prevention, avoidance, Banker's algorithm, deadlock detection and recovery.

Module IV: 9 Hours

Memory Management: Logical and physical address space, dynamic loading and linking, swapping, Non Contiguous Memory Allocation: Paging, Segmentation;

Virtual Memory Management: Demand paging, page fault, basic page replacement policy, Page Replacement Algorithms: FIFO, OPT, LRU, LFU, MFU, Thrashing, working-set model.

Secondary Storage Structure: Overview of mass storage structure, disk structure; Disk Scheduling: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK,

Text Books:

1. A. Silberschatz, P. B Galvin, and G Gagne, Operating Systems Principles, 9th Edition, Wiley India, 2019.
2. William Stallings, "Operating Systems Internals & Design Principles", 9th Edition, Pearson Education, 2018.

Reference Books:

1. A. S. Tanenbaum, Modern Operating Systems, 4th Edition, PHI Learning, 2018.

2. P. B. Prasad, Operating Systems and System Programming, 3rd Edition, SciTech Publishers, 2018.