CS 304 : OPERATING SYSTEMS (3-0-2: 4)

Introduction
Operating Systems Functionalities - Formal Definition - Evolution – Types of operating system.

Process Management
Process concept -Process control block, Process Hierarchy, Threads, IPC models: shared memory and message passing. CPU Scheduling algorithms. Process Synchronization - Peterson's Solution, Process Synchronization- Semaphores, Critical Regions, Monitors - Deadlock prevention- Deadlock avoidance and Deadlock Detection and Recovery - Bankers Algorithm.

Memory Management: Overview of Swapping - Multiple Partitions – Paging, Page table, Segmentation, Demand paging- Fragmentation & Compaction- Page replacement algorithms, Memory allocation algorithms: first fit, Best fit, worst fit.

File System
Contiguous-Sequential and Indexed Allocation-File system interface-File System implementation.

I/O System
RAID-disk scheduling- Device drivers - block and character devices-streams, Character and Block device switch tables

Suggested list of Experiments:
01) Implementation of CPU scheduling algorithms.
02) Classical Process Coordination & Synchronization Problems like Bounded Buffer Producer-Consumer, Readers-Writers, Dinning philosophers, Page replacement algorithms.
03) Implementation of interrupts, process hierarchy, semaphore etc using Vx Works Operating system for real time system.

Text Books

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, "Operating System Concepts", John Wiley & Sons Inc.

References
1. Andrew S Tanenbaum, "Modern Operating Systems", Prentice Hall
2. William Stallings , " Operating System: Internals and Design Principles", Pearson.
3. D M Dhamdhere, "System Programming and Operating Systems", TMH.
4. Gary Nutt, " Operating Systems: A Modern Perspective", Addison Wesley
5. Achyut S Godbole, "Operating Systems - Operating Systems", Tata McGraw Hill.