R22 B.Tech. CSE (AI and ML) Syllabus JNTU Hyderabad

**OPERATING SYSTEMS**

**B.Tech. II Year I Sem. L T P C**

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**Prerequisites:**

1. A course on “Computer Programming and Data Structures”.

2. A course on “Computer Organization and Architecture”.

**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

**Process** - Process concepts and scheduling, Operations on processes, Cooperating Processes, Threads

**UNIT - II**

CPU Scheduling - Scheduling Criteria, Scheduling Algorithms, Multiple -Processor Scheduling. System call interface for process management-fork, exit, wait, waitpid, exec

Deadlocks - System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock

**UNIT - III**

**Process Management and Synchronization** - The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors

**Inter Process 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, Page Replacement, 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 system calls.

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**TEXT BOOKS**:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition,

John Wiley.

2. Advanced programming in the UNIX environment, W.R. Stevens, Pearson education.

**REFERENCE BOOKS:**

1. Operating Systems- Internals and Design Principles, William Stallings, Fifth Edition–2005,

Pearson Education/PHI

2. Operating System A Design Approach- Crowley, TMH.

3. Modern Operating Systems, Andrew S. Tanenbaum 2nd edition, Pearson/PHI

4. UNIX programming environment, Kernighan and Pike, PHI/ Pearson Education

5. UNIX Internals -The New Frontiers, U. Vahalia, Pearson Education