

Subject Code	Subject Name	Credits
26CS008	OPERATING SYSTEMS	04

Course Objectives

1. To understand the basics of how a system operates
2. To understand the inner working of an operating system
3. To arm one in the various concepts pertaining to system management

Learning Outcomes

1. To learn the operating system architecture
2. To learn about memory management

Unit 1 - Operating System (12 Hrs.)

An Introduction: - Definition and functions of Operating System, Evolution of Operating Systems-Simple Batch Operating Systems, Multi-programmed Batched Operating Systems, Time- Sharing operating Systems, Personal Computer Operating Systems, Multi-processor Operating Systems, Distributed Systems, Real-Time Systems; Operating system Structures-Layered approach, The kernel based approach, The virtual machine approach.

Unit 2 - Operating System Architecture (12 Hrs.)

Operating System as an Extended Machine, Layered Approach, Micro-Kernels, UNIX Kernel Components, Modules, System Calls, Introduction to Virtual Machines, Virtual Environment & Machine Aggregation, Implementation Techniques.

Unit 3 - Input-Output Architecture (12 Hrs.)

I/O Structure, I/O Control Strategies-Program controlled I/O, Interrupt, Direct memory access; The I/O Address Space. Process Management: Process, Process State, Process Control Block, Process Scheduling, Operation on processes, Co-operating Processes, Threads.

Unit 4 - Memory Management (12 Hrs.)

Logical versus Physical Address Space Swapping; Contiguous Allocation-Single partition Allocation, Multiple Partition Allocation, Fragmentation; Paging-Concept of paging, Page Table Implementation; Segmentation-Concept of Segmentation, Segmentation Hardware, External Fragmentation.

Unit 5 - File System Interface and Implementation (12 Hrs.)

Concept of a File- Attributes of a File, Operations on Files, Types of Files; Structure of File; File Access Methods- Sequential Access, Direct Access, Indexed Sequential Access; Directory Structure: Single Level Directory, Two Level Directory; Tree Structured Directories; Allocation Methods- Contiguous allocation, Linked allocation, Indexed allocation, Performance comparison; Free Space Management, Directory Implementation.

References:

1. William Stallings, Operating Systems: Internals and Design Principles, 6th Ed., Pearson Education
2. Silberschatz, Galvin, & Gagne, Operating System Concepts, 8th Ed., Wiley
3. Tanenbaum A.S., Modern Operating Systems, 3rd Ed., Prentice Hall

