

SREENIVASA INSTITUTE of TECHNOLOGY and MANAGEMENT STUDIES

I MCA - II Semester

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16MCA122

OPERATING SYSTEMS

Course Objectives:

- To be aware of the evolution and fundamental principles of operating system, processes and
- their communication
- To understand the various operating system components like process management, memory
- management and
- To know about file management and the distributed file system concepts in operating systems
- To be aware of components of operating system with relevant case study

Syllabus:

UNIT I : Operating Systems Introduction

Definition & Views of OS - Operating Systems objectives and functions - Computer System Architecture - OS Structure - OS Operations. **Evolution of Operating Systems** : Simple Batch - Multi programmed - Time-shared - Parallel - Distributed Systems - Real-Time Systems - Hand Held Systems & Multimedia system. Operating System services - User OS Interface - System Calls - Types of System Calls - System Boot.

UNIT II : Process Concepts and CPU Scheduling

Process Concepts : The Process - Process State - Process Control Block - Processes & Threads. **Process Scheduling Principle** : Scheduling Queues – Schedulers - Context Switch - Preemptive Scheduling –Dispatcher - Scheduling Criteria. **CPU Scheduling** : Scheduling algorithms –FCFS – SJF – Priority - Round Robin - Multi level Queue – Multiple processor.

UNIT III : Process Coordination & Deadlock

Process Coordination : Synchronization Background - The Critical Section Problem - Peterson's solution - Synchronization Hardware – Semaphores - Classic Problems of Synchronization. **Deadlocks** : System Model -Deadlock Characterization - Methods for Handling Deadlocks - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection and Recovery from Deadlock.

UNIT IV: Mass Storage Structure & Memory Management

Mass Storage Structure : Overview of Mass Storage Structure - Disk Structure - Disk Attachment - Disk Scheduling - Disk Management. **Memory Management :** Logical & Physical Address Space – Swapping - Contiguous Memory Allocation – Paging - Structure of Page Table – Segmentation - Page Replacement Algorithms.

UNIT V: File system Interface & System Protection

File System Interface : The Concept of a File - Access methods – Directory & Disk Structure - File System Mounting - File Sharing – File System Implementation. **System Protection :** Goals of Protection - Principles of Protection - Domain of Protection. Security Issues - The Security problem - Program threats - System and network threats.

Course Outcomes:

- Able to understand the operating system components and its services
- Implement the algorithms in process management and solving the issues of IPC
- Able to demonstrate the mapping between the physical memory and virtual memory
- Able to understand file handling concepts in OS perspective
- Able to understand the operating system components and services with the recent OS

TEXT BOOKS:

1. Operating System Principles , 8/e, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Wiley Student Edition.
2. Operating Systems – Internals and Design Principles, 6/e, W. Stallings, Pearson Education.

REFERENCE BOOKS:

1. Operating Systems - A concept based Approach, 2/e, 2006, D.M.Dhamdhare, TMH, New Delhi.
2. Operating Systems, 3/e, 2007, Deitel & Deitel, Pearson Education, New Delhi.
3. Operating Systems- A Modern Perspective, 2/e, 2002, Gary Nutt, Pearson Education.
4. Operating Systems-Design & Implementation,3/e, 2007, Andrew S Tanenbaum, Pearson Education, New Delhi.
5. Principles of Operating Systems, 1/e, 2010, V Ramesh, Laxmi Publications, New Delhi.