

SCSA1501	OPERATING SYSTEMS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To have an overview of different types of operating systems.
- To learn and implement the concept of process management.
- To observe the concept of storage management.
- To understand the concept of I/O and file systems.
- To learn the basics of Linux Programming.

UNIT 1 INTRODUCTION**9 Hrs.**

Introduction - Operating system structures - System components - OS services - System calls - System structure - Resources Processes - Threads - Objects - Device management - Different approaches - Buffering device drivers.

UNIT 2 PROCESS MANAGEMENT**9 Hrs.**

Processes - Process concepts - Process scheduling - Operations on processes - Cooperating processes - CPU scheduling - Basic concepts - Scheduling criteria - Scheduling algorithms - Preemptive strategies - Non-preemptive strategies.

UNIT 3 SYNCHRONIZATION AND DEADLOCKS**9 Hrs.**

The critical section problem - Semaphores - Classic problems of synchronization - Critical regions - Monitors-Dead locks - Deadlock characterization - Prevention - Avoidance - Detection - Recovery.

UNIT 4 MEMORY MANAGEMENT**9 Hrs.**

Storage Management Strategies - Contiguous Vs. Non-Contiguous Storage Allocation - Fixed and Variable Partition Multiprogramming - Paging - Segmentation - Paging/Segmentation Systems - Page Replacement Strategies - Demand & Anticipatory Paging - File Concepts - Access Methods - Directory Structure - File Sharing - Protection - File - System Structure - Implementation.

UNIT 5 I/O SYSTEM, LINUX & SHELL PROGRAMMING**9 Hrs.**

Mass Storage Structure - Disk Structure- Disk Scheduling - Disk Management - Swap Space Management - RAID Structure - Shell Operation Commands - File Management Operation - Internet Service - Telnet - FTP - Filters and Regular Expressions- Case Study (Linux) - Shell Programming - Variable, Arithmetic Operations, Control Structures, Handling Date, Time and System Information.

Max. 45 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1 - Understand the fundamental components of a computer operating system and how computing resources are managed by the operating system.
- CO2 - Apply the concepts of CPU scheduling, synchronization and deadlocks in real computing problems.
- CO3 - Demonstrate the different memory and I/O management techniques used in Operating Systems.
- CO4 - Have practical exposure to the concepts of semaphores and monitors for process synchronization.
- CO5 - Create design and construct the following OS components: Schedulers, Memory management systems in the modern operating system.
- CO6 - Understand file system structure and implement a file system such as FAT.

TEXT/ REFERENCE BOOKS

1. Abraham Silberschatz, Peter Galvin and Gagne, "Operating System Concepts", 10th Edition, Addison Wesley, 2018.
2. Harvey M.Deitel, "Operating System", 3rd Edition, Addison Wesley, 2004.
3. Gary Nutt, "Operating System, A modern perspective", 3rd Edition, Addison Wesley, 2004.
4. Richard Peterson, "Linux : The Complete Reference", 6th Edition, Tata McGraw Hills, 2008.
5. Andrew S. Tanenbaum, "Modern Operating Systems".4th edition 2015.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks : 100****Exam Duration : 3 Hrs.****PART A :** 10 Questions of 2 marks each-No choice**20 Marks****PART B :** 2 Questions from each unit with internal choice, each carrying 16 marks**80 Marks**