

SYLLABUS

UNIT I

8 Periods

Introduction to Operating Systems: Over View of Operating Systems, Types of Operating Systems, Operating System Structures, Operating System Services, System Calls, Virtual Machines, Operating System Design and Implementation.

Introduction to Shell Programming: Commands and Shell script.

Learning outcomes:

1. Define the responsibilities of an operating system and implement the basic shell programs.
2. Demonstrate the different modes of shell scripts

UNIT II

12 Periods

Process Management: Process concept, Process scheduling, Operations on process, Inter process communication, Communication in client-server systems.

Threads: Overview, Multithreading models

CPU Scheduling: Scheduling criteria, Scheduling algorithms, Algorithm Evaluation.

Case Study: Linux operating system: Process Management.

Learning outcomes:

1. Define the different models of communication among process and multi-threading models.
2. Implement the different solutions for process management.

UNIT III

12 Periods

Process Synchronization: The Critical Section Problem, Peterson's Solution problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors.

Deadlocks: Avoidance, Deadlock Detection, Recovery from Deadlocks and handling dead locks.

Case Study: Linux operating system: Memory Management

Learning outcomes:

1. Define the concept of deadlock and identify the different ways to handle deadlock like prevention, detection, avoiding and recovery.
2. Implement the different solutions for process synchronization.

UNIT IV

10 Periods

Memory Management: Logical versus Physical Address, allocation (Contiguous and Non-Contiguous allocation), protection, hardware support, paging Swapping, segmentation, TLBs

Virtual Memory: Demand Paging, Allocation, Page Replacement, Thrashing.

Learning outcomes:

1. Implement Paging problems in different aspects.
2. Distinguish the concept of different allocation methods.

UNIT V**10 Periods**

File Systems: Implementation: Basic Concepts of a file, Access Methods, Directory Structure, Protection, File System Structure, File System design and Implementation allocation methods, directory management, mounting.

Secondary-Storage Structure: Disk attachment, Disk scheduling, Disk management. I/O Systems, Goals of Protection, Access Matrix, Implementation of Access Matrix.

Learning outcomes:

1. Demonstrate the concept of mass storage structures and analyse the various disk scheduling algorithms
2. Demonstrate the concept of file system, various file access methods and Protection in files.

TEXT BOOKS

1. Abraham Silberschatz, Peter B.Galvin and Greg Gagne, “Operating System Concepts”, 10th Edition, Wiley India Pvt Ltd, 2018.
2. Sumitabha Das, “Unix Concepts and Applications”, 4th Edition.TMH, 2017.
3. YashwanthKanitkar, “Unix Shell programming”, 1st Edition, BPB Publisher, 2016.

REFERENCES

1. Andrew S. Tanenbaum, “Modern Operating Systems”, 5th Edition, Pearson Education, 2015.
2. William Stalling, “Operating Systems: Internals and Design Principles”, 9th edition, PHI, 2018.
3. Harvey M. Deitel, “Operating Systems”, 3rd Edition, Pearson Education, 2010.

WEB REFERENCES:

1. <https://nptel.ac.in/courses/106/106/106106144/>
2. https://nptel.ac.in/content/storage2/courses/106108101/pdf/PPTs/Mod_13.pdf