

DETAILED SYLLABUS

UNIT - I INTRODUCTION TO OPERATING SYSTEMS

14 Hrs

1.1 Basics of Operating Systems: Definition – Generations of Operating systems – Types of Operating Systems: Mainframe, Desktop, Multiprocessor, Distributed, Clustered, Multiprogramming, Real time, Embedded and Time sharing.

1.2 Operating System Components: Process Management component – Memory Management component - I/O Management component – File Management component - Protection System – Networking management component – Command interpreter

1.3 Operating System Services: Process Execution – I/O operations – File manipulations – Communications – Error detection and recovery – Resource allocation – Accounting – System Protection - System Calls – System call Execution

1.4 Operating System Structures: Simple structure, Layered, Monolithic, Microkernel Operating Systems – Concept of Virtual Machine – Booting

UNIT – II PROCESS MANAGEMENT

16 Hrs

2.1 Processes: Definition – Process Relationship - Process states – Process State transitions - Process Control Block – Context switching – Threads – Concept of multithreads – Benefits of threads – Types of threads

2.2 Process Scheduling: Definition – Scheduling objectives – Types of Schedulers – Scheduling criteria – CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition only) – Scheduling algorithms – Pre emptive and Non – pre emptive - FCFS – SJF – RR - Multiprocessor scheduling – Types - Performance evaluation of the scheduling.

2.3 Inter-process Communication and Synchronization: Definition – Shared Memory System – Message passing – Critical section – Mutual Exclusion - Semaphores.

2.4 Deadlocks: Definition – Deadlock characteristics – Deadlock Prevention – Deadlock Avoidance – Deadlock detection and Recovery.

UNIT – III MEMORY MANAGEMENT

12 Hrs

3.1 Basic Memory Management : Definition – Logical and Physical address map – Memory allocation – Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation and Compaction – Paging – Principle of operation – Page allocation – Hardware support for paging – Protection and sharing – Disadvantages of paging.

3.2 Virtual Memory : Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault , Working Set , Dirty page/Dirty bit – Demand paging (Concepts only) – Page Replacement policies – Optimal (OPT) , First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used (LRU)

UNIT – IV I/O AND FILE MANAGEMENT , SECURITY & PROTECTION

13Hrs

4.1 Disk Management: Disk Structure, Disk Scheduling and its algorithms, RAID TECHNOLOGY.

4.2 File Management: File concept – File attributes – Name, Identifier, Type, Location, Size, Time, Date, user identification – File Operations - Directory Structure – Single level, Two level, Tree Structure – Disk space allocation methods– Contiguous, Linked, Indexed.

Access Methods – Sequential, Random access – File system structure – Byte sequence, Record sequence and Tree-based – Disk formatting

4.3 Security and Protection: Security threats – Security Policies and mechanisms – Authentications

UNIT – V LINUX – A CASE STUDY

10 Hrs

5.1 Introduction – History of Linux – Features of Linux- Linux Architecture - Popular Flavors of Linux - FSF/GNU - Linux Desktop: GNOME-KDE.

5.2 File System – ext2 – Virtual File System - Different types of files - File Management – File Security – 3 levels – Mounting file system – Unmounting
5.3. Process Management: Process creation, Process states

REFERENCES

Sl. No.	TITLE	AUTHOR	PUBLISHER	Year of Publishing / Edition
1.	Operating system, Principals & Design	Pal Chaudhury	PHI Learning	First Edition
2.	Operating System	William stalling	Pearson Education, New Delhi.	2003
3.	Operating Systems	Deitel and Deitel	Pearson Education, New Delhi.	Third Edition, 2007
4.	Operating System	Rohit Khurana ITLESE	Vikas Publishing Ltd	First Edition 2011