

Operating Systems

S.No	Topic	No Hours
1	Batch, iterative, time sharing, multiprocessor, distributed, cluster and real-time systems, Unix system introduction and commands	3
2	Computer system structure, Network structure, I/O Structure, Storage Structure, Dual mode operation	2
3	System components, Operating-System Services, System Calls, System Programs, System Structure, Virtual Machines, System Design and Implementation, System Generation	2
4	Process Concept, Process Scheduling, Operations on Processes, Cooperating Processes, Interprocess Communication, Communication in Client – Server Systems	2
5	Multithreading Models, Threading Issues, Pthreads	2
6	Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Algorithm Evaluation, Process Scheduling Models	3
7	Synchronization Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Critical Regions, Monitors, OS Synchronization, Atomic Transactions	3
8	System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock	3
9	Memory Management Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Segmentation with Paging	3
10	Demand Paging, Process Creation, Page Replacement, Allocation of Frames, Thrashing, Operating-System Examples, Other Considerations	3
11	File Concept, Access Methods, Directory Structure, File-System Mounting, File Sharing, Protection	1
12	File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery, Log-Structured File System, NFS	2
13	I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O to Hardware Operations, STREAMS, Performance	3
14	Disk Structure , Disk Scheduling , Disk Management, Swap-Space Management, RAID Structure , Disk Attachment, Stable-Storage Implementation, Tertiary-Storage Structure	3
15	Goals of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Revocation of Access Rights, Language-Based Protection, Capability-Based Systems	2
16	The Security Problem , User Authentication , Program Threats, System Threats, Securing Systems and Facilities, Intrusion Detection, Cryptography, Computer-Security Classifications	3
	TOTAL	40 Hours

Evaluation Scheme

Minor Test-2	20%
Mid Test	30%
End Test	50%

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Principles, Wiley, 8/e
2. Richard Stevens, Stephen Rago, Advanced Programming in the UNIX Environment, Pearson Education, 2/e