

DSM353Operating System

Semester: V	Course Title: Operating System	Credit: 4
Course Code: DSM362		(3 T + 1 P)

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVE ABILITIES	COURSE OUTCOMES
CO1	REMEMBERING	Recall fundamental concepts and architecture of operating systems.
CO2	UNDERSTANDING	Explain the structure and functioning of processes, memory, and file systems.
CO3	APPLYING	Apply concepts of scheduling, memory management, and synchronization.
CO4	ANALYSING	Analyze and compare different OS strategies and algorithms.
CO5	EVALUATING	Evaluate the performance and suitability of OS components for given scenarios.
CO 6	CREATING	Design and implement basic Unix shell scripts for OS-level tasks.

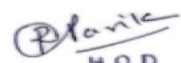
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	2	1
CO 2	3	3	2	2	1
CO 3	2	3	3	3	2
CO 4	3	3	3	3	2
CO 5	3	3	3	2	2
CO 6	3	3	3	3	3

Unit No.	Detailed Syllabus	Teaching Hours
I	Introduction to Operating Systems What is an Operating System? ,Types of Operating Systems: Batch, Multitasking, Time-Sharing, Real-Time, Functions of Operating Systems , System Calls and Kernel, OS Structures: Monolithic, Layered, Microkernel, ModularIntroduction to Processes: states, PCB, context switching	15
II	Process Management & CPU Scheduling Threads: user-level vs kernel-level, multithreading models, Process Scheduling:FCFS, SJF, Round Robin, Priority Scheduling, Preemptive vs Non-preemptive, Inter-Process Communication (IPC): Shared memory, Message passing ,Synchronization:Critical section problem, Semaphores, Mutex, Monitors, Deadlocks: Detection, Prevention, Avoidance (Banker's algorithm)	15
III	Memory, File, and I/O Management Memory Management:Contiguous Allocation, Paging, SegmentationVirtual Memory, Demand Paging, Page Replacement Algorithms (FIFO, LRU), File System Management:File operations, access methods, Directory structure, file allocation (contiguous, linked, indexed)Free space management, I/O	15

	Systems:I/O hardware, polling, interrupts, DMA, Disk scheduling algorithms: FCFS, SSTF, SCAN, C-SCAN	
IV	Practical Applications • Use of basic system utilities: cal, date, echo, bc, who, uname, man, passwd, wc • File and directory operations: pwd, ls, mkdir, rmdir, cp, mv, rm, chmod, find • File creation and content display: touch, cat, more, less, head, tail • File comparison and redirection: cmp, comm, diff, pipes (), tee • Text processing with simple filters: cut, paste, sort, uniq, tr, pr • Pattern matching and editing using grep, sed, and basic regular expressions • Introduction to awk: field selection, variables, conditions, and loops • File editing using text editors: vi, pico, and emacs • Shell scripting basics: variables, input/output (read, echo), and arithmetic with expr • Control flow in scripts: if, else, elif, case, loops (for, while, until), break, continue • Mini-project: Develop a functional shell script integrating utilities and logic for real-world OS tasks	15

Suggested Reference Books:

1. Operating System Concepts – Abraham Silberschatz, Peter B. Galvin, Greg Gagne (Wiley)
2. Modern Operating Systems – Andrew S. Tanenbaum (Pearson)
3. Operating Systems: Internals and Design Principles – William Stallings (Pearson)
4. Unix and Shell Programming – Behrouz A. Forouzan
5. Linux Command Line and Shell Scripting Bible – Richard Blum
6. Unix : Concepts and Applications (Fourth Edition) Publisher: Tata McGrawHillBySumitabha Das


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