

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY

(Autonomous)

Kanuru, Vijayawada-520007

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (Data Science)

III B Tech – II Semester

OPERATING SYSTEMS

Course Code	23DS3602	Year	III	Semester	II
Course Category	PCC	Branch	CSE (Data Science)	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Data Structures and Computer Organization.
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes		
Upon Successful completion of course, the student will be able to		
CO1	Describe the core functionalities of operating systems to ensure efficient management of processes, memory, storage, and file systems.	L2
CO2	Apply CPU scheduling, process synchronization, and deadlock handling techniques for efficient process management.	L3
CO3	Utilize memory management techniques and file system operations to optimize system performance and ensure efficient storage and retrieval of data.	L3
CO4	Analyze the effectiveness of scheduling, synchronization, memory allocation, and file protection mechanisms to evaluate system performance and resource utilization in multiprogramming environments.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations													
(3:High, 2: Moderate, 1:Low)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2												
CO2	3												
CO3	3												
CO4		3									2		

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Syllabus		
Unit No.	CONTENTS	Mapped CO
I	<p>Operating Systems Overview: Introduction, Operating System Functions, Operating Systems Operations, Computing Environments, Free and Open-Source Operating Systems.</p> <p>System Structures: Operating System Services, User and Operating-System Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation.</p>	CO1
II	<p>Processes: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication.</p> <p>Threads and Concurrency: Multithreading Models, Thread Libraries, Threading Issues.</p> <p>CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple Processor Scheduling.</p>	CO1, CO2, CO4
III	<p>Synchronization Tools: The Critical Section Problem, Peterson's Solution, Mutex Locks, Semaphores, Classic Problems of Synchronization, Monitors.</p> <p>Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.</p>	CO1, CO2, CO4
IV	<p>Memory-Management Strategies: Introduction, Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table.</p> <p>Virtual Memory Management: Introduction, Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing.</p> <p>Storage Management: Overview of Mass Storage Structure, HDD Scheduling.</p>	CO1, CO3, CO4
V	<p>File System Interface: File Concept, Access Methods, Directory Structure.</p> <p>File System Implementation: File-System Structure, File-System Operations, Directory Implementation, Allocation Method, Free Space Management.</p> <p>File System Internals: File-System Mounting, Partitions and Mounting, File Sharing.</p> <p>Protection: Goals of Protection, Principles of Protection, Protection Rings, Domain of Protection, Access Matrix.</p>	CO1, CO3, CO4
Learning Resources		
Text Books		
1. Operating System Concepts, Silberschatz A., Galvin P. B., Gagne G., 10th Edition, 2018, Wiley. 2. Modern Operating Systems, Tanenbaum A. S., 4th Edition, 2016, Pearson.		
Reference Books		

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1. Operating Systems – Internals and Design Principles, Stallings W., 9th Edition, 2018, Pearson.
2. Operating Systems: A Concept-Based Approach, D. M. Dhamdhere, 3rd Edition, 2013, McGraw-Hill.

E-Resources & other digital material

1. https://onlinecourses.nptel.ac.in/noc25_cs141/preview
2. <http://peterindia.net/OperatingSystems.html>
3. <https://www.geeksforgeeks.org/operating-systems/operating-systems/>
4. <https://www.techtarget.com/whatis/definition/operating-system-OS>
5. https://onlinecourses.nptel.ac.in/noc25_cs94/preview