



Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
CEE91A	Modern Operating System(MOS)	3	--	--	3	--	--	3
		Examination Scheme						
		ISE		MSE		ESE		
		10		30		100 (60% Weightage)		

Pre-requisite Course Codes		
At the end of successful completion of the course, students will be able to		
Course Outcomes	CO1	Apply the principles and concepts in analyzing and designing Advance Operating System.
	CO2	Demonstrate the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system
	CO3	Analyze the performance and reliability of different Advanced Operating Systems.
	CO4	Solve the problems in real time task scheduling and mobile operating systems
	CO5	Apply the concepts on database operating systems in real life applications
	CO6	Compare mobile device architectures

Module No.	Unit No.	Topics	Ref.	Hrs.
1	1.1	Introduction: Types of Advanced Operating Systems.	1	04
	1.2	Architectures and design issues of Network operating system, DOS, Middleware, RTS, DBOS		
	1.3	Introduction to process, Concurrent processes, Critical Section problems, other synchronization problems.		
2	2.1	Distributed operating Systems, Scheduling and synchronization: Scheduling: Issues in load distributing, Components of load distributing algorithms, Stability, Load distributing algorithms, Performance Comparison, Selecting a suitable load sharing Algorithm.	1,5,6	12
	2.2	Synchronization: Physical and logical clocks. Distributed Mutual Exclusion: Introduction, Classification of Mutual Exclusion algorithms, Mutual Exclusion Algorithms. Distributed Deadlock: Introduction, deadlock handling strategies, Deadlock detection: Issues and resolution, Control Organizations, Centralized algorithms, Distributed algorithms, Hierarchical algorithms.		
3	3.1	Real Time Systems: Basic Model of Real time systems , Characteristics, Applications of Real time systems, Real time task	1,2,8	16



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		scheduling, Types of tasks and their characteristics, Task Scheduling, Clock driven Scheduling , Hybrid Schedulers, Event driven Scheduling, EDF Scheduling, Rate Monotonic Algorithm, handling resource sharing Resource Handling: Resource Sharing, Priority Inversion, PIP,PCP,HLP, Scheduling real time tasks in distributed systems		
	3.2	Mobile operating systems: Micro kernel design, client server resource access, Processes and threads, Memory management, File systems.		
4	4.1	Database Operating systems: Concurrency control : Database systems, Concurrency control model of database systems , Problem of Concurrency Control, serializability theory, Distributed Database Systems	1,6	6
	4.2	Concurrency Control Algorithms : Basic synchronization Algorithms, Lock based, Timestamp based and Optimistic Algorithms, Concurrency Control Algorithms : Data Replication		
5	5.1	CASE STUDIES: Linux system: Design Principles , Kernel modules , Process management scheduling , memory management , I/O management , file systems , inter process communication	3,5	4
	5.2	IOS and Android: Architecture and SDK frame work , Media layer , Services layer , core os layer , file Systems		
			Total	42

References:

- [1] Mukesh Singhal, Niranjan G.Shivaratri, "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems" .MC Graw Hill education.
- [2] Rajib Mall, "Real-Time Systems: Theory and Practice", Pearson education.
- [3] Neil Smyth, "iPhone IOS 4 Development Essentials – Xcode", Fourth edition, Payload media, 2011
- [4] Daniel P Bovet and Marco Cesatl, "Understanding the Linux kernel",3rd edition, O'Reilly,2005
- [5] Andrew S.Tanenbaum, "Modern Systems Principles and Paradigms". PHI
- [6] Pradeep K.Sinha, "Distributed Operating System-Concepts and design", PHI.
- [7] Andrew S.Tanenbaum, "Distributed Operating System", Pearson Education.
- [8] Jane W. S. Liu, "Real Time Systems", Pearson education.