



# 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
TEITC502	Operating Systems	4	-	-	4	-	-	4
		Examination Scheme						
		ISE		MSE		ESE		
		10	30	100 (60%Weightage)				

Pre-requisite Course Codes	
After successful completion of the course, student will be able to:	
Course Outcomes	CO1 Describe the basic functions of operating systems.
	CO2 Implement various process scheduling algorithm.
	CO3 Design inter process communication solution
	CO4 Categorize various memory management techniques.
	CO5 Apply disk scheduling algorithms.
	CO6 Differentiate among various file systems.
	CO7 Explore functions of operating systems in different Environment.

Module No.	Topics	Ref.	Hrs.
1	<b>Overview of Operating System</b> Operating system objectives and functions, Evolution of OS, Characteristics of modern OS, Basic concepts: Processes, Files, System calls, Shell, Kernel architectures: Monolithic, Micro-kernel, Layered, Kernel mode of operations.	1,2	4
2	<b>Process Management</b> Process description: Process, Process States, Process Control Block (PCB), Threads, Thread management. Process Scheduling: Types, Comparison of different scheduling policies	1,2,4,5	10
3	<b>Process Co-ordination</b> Principles of Concurrency, Race condition and critical section, Mutual Exclusion- Hardware and Software approaches, Semaphores, Monitors, Message Passing, Producer Consumer Problem. Deadlock: Principles of Deadlock, Deadlock Detection, Deadlock Avoidance, Deadlock Prevention.	1,2	10
4	<b>Memory Management</b> Memory Management Requirements, Memory Partitioning, Virtual memory: Paging; Segmentation; Page replacement policies, page faults.	1,2	6



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<b>5</b>	<b>Input Output Management</b> I/O Devices, Organization of the I/O Function, Operating System Design Issues, I/O Buffering, Disk Scheduling and disk scheduling algorithms, Disk cache.	1,2	6
<b>6</b>	<b>File Management:</b> Overview, File Organization, File Sharing; Record Blocking; Secondary Storage Management.	1,2	6
<b>7</b>	<b>Case Studies</b> Producer Consumer Problem, Multithreading, RAID, File systems of Windows and Linux , Overview of Android OS.	1,2,3	6
	<b>Total hours of instructions</b>		48

## References:

1. Silberschatz A., Galvin P., Gagne G. “*Operating Systems Principles*”, Willey Eight edition.
2. William Stallings “*Operating System-Internal & Design Principles*”, Pearson.
3. Andrew S. Tanenbaum, “*Modern Operating System*”, Prentice Hall.
4. Maurice J. Bach “*The Design of Unix Operating System*”, Prentice Hall.
5. B. M. Harwani “*Unix and Shell Programming*” by Oxford.