

CSE2005	OPERATING SYSTEMS				L	T	P	J	C
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Pre-requisite	NIL				Syllabus version				
					v1.0				
Course Objectives:									
<ol style="list-style-type: none"> 1. To introduce the concept of Operating system concepts and designs and provide the skills required to implement the services. 2. To describe the trade-offs between conflicting objectives in large scale system design. 3. To develop the knowledge for application of the various design issues and services. 									
Expected Course Outcome:									
<ol style="list-style-type: none"> 1. Interpret the evolution of OS functionality, structures and layers. 2. Apply various types of system calls and to find the stages of various process states. 3. Design a model scheduling algorithm to compute various scheduling criteria. 4. Apply and analyze communication between inter process and synchronization techniques. 5. Implement page replacement algorithms, memory management problems and segmentation. 6. Differentiate the file systems for applying different allocation and access techniques. 7. Representing virtualization and Demonstrating the various Operating system tasks and the principle algorithms for enumerating those tasks. 									
Module:1	Introduction				2 hours				
Introduction to OS: - Functionality of OS - OS Design issues - Structuring methods (monolithic, layered, modular, micro-kernel models) - Abstractions, processes, and resources - influence of security, networking, multimedia.									
Module:2	OS Principles				3 hours				
System Calls System/Application Call Interface - Protection User/Kernel modes - Interrupts Processes and Threads - Structures (Process Control Block, Ready List etc).									
Module:3	Scheduling				5 hours				
Processes Scheduling - CPU Scheduling - Pre-emptive non-pre-emptive - Resource allocation and management - Deadlocks Deadlock Handling Mechanisms.									
Module:4	Concurrency				4 hours				
Inter-process communication Synchronization - Implementing Synchronization Primitives Semaphores - Monitors - Multiprocessors and Locking - Scalable Locks - Lock-free Coordination.									
Module:5	Memory management				5 hours				
Main Memory management Memory allocation strategies Caching -Virtual Memory Hardware TLB - Virtual Memory OS techniques Paging Segmentation Page Faults Page Replacement Thrashing Working Set.									
Module:6	Virtualization				4 hours				
Virtual Machines Virtualization (Hardware/Software, Server, Service, Network) Hypervisors -OS - Container Virtualization - Cost of virtualization.									
Module:7	File systems				3 hours				
File system interface - file system implementation File system recovery Journaling - Soft updates LFS - Distributed file system.									
Module:8	Security Protection and trends				4 hours				
Security and Protection - Mechanism Vs Policies Access and authentication - models of protection Memory Protection Disk Scheduling - OS performance, Scaling OS - Mobile OS: Recent Trends: - Future directions in Mobile OS / Multi-core Optimization /Power efficient Scheduling									