



22CST43 - OPERATING SYSTEMS							
Programme & Branch	B.E. - Computer Science and Engineering	Sem.	Category	L	T	P	Credit
Prerequisites	Nil	4	PC	3	0	0	3
Preamble	This course provides basic operating system structures, system call interface, process, threads, and inter-process communication. Various management functions of an operating system will also be explored.						
Unit – I	Operating Systems Overview:						9
Introduction – Computer System Organization – Computer System Architecture – Operations – Resource Management – Security and Protection – Virtualization – Computing Environments. Operating Systems Structures: Services – User and OS Interface – System Calls – Linkers and Loaders – Operating system Structure – Building and Booting OS.							
Unit – II	Process Management:						9
Process Concept – Process Scheduling – Operations on Processes – Interprocess Communication – IPC in Shared Memory and Message Passing Systems. CPU Scheduling: Scheduling Criteria – Scheduling Algorithms. Multithreaded Programming: Threads Overview – Multicore Programming – Multithreading Models.							
Unit – III	Process Synchronization:						9
The Critical Section Problem – Peterson’s solution – Hardware support for Synchronization – Mutex Locks – Semaphores – Monitors. Deadlocks: Deadlock Characterization – Methods for handling deadlocks - Deadlock Prevention and Avoidance – Deadlock Detection – Recovery from Deadlock.							
Unit – IV	Memory Management:						9
Main Memory: Background – Contiguous Memory Allocation – Segmentation – Paging – Swapping. Virtual Memory: Background – Demand Paging – Page Replacement – Case study: Intel 32 Architecture.							
Unit – V	Storage Management:						9
Mass Storage Structure: Overview – HDD Scheduling. File System: File Concept – Access Methods – Directory Structure – Protection. File System Implementation: File System Structure – File System Operations – Directory Implementation – Allocation Methods - Free Space Management. – Security : The Security Problem – program Threats - Case study: Linux System.							
Total:45							
TEXT BOOK:							
1.	Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 10th Edition, John Wiley & Sons Inc., 2018.						
REFERENCES:							
1.	William Stallings, “Operating Systems Internals and Design Principles”, 9th Edition, Prentice Hall, 2018.						
2.	Andrew S. Tanenbaum, “Modern Operating Systems”, 4th Edition, Pearson Education, 2016.						