I Year M.Tech. CSE I - Semester **L T P To C**
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CS603 ADVANCED OPERATING SYSTEMS

Objective of the Course :

Objective of the Course: This course contains the basic and advanced concepts of operating systems. After completing this course students should understand how the operating system defines an abstraction of hardware behavior with which programmers can control the hardware. It also enables the students to understand how operating system manages resource sharing among the computer's users.

UNIT - I

Process Scheduling & Process Synchronization :

Process Concept: Overview, Process scheduling, Operations on process, Inter process communication, Process scheduling criteria, uniprocess scheduling and multi process scheduling algorithms. Process Synchronization: Background, Hardware Support to Process Synchronization, Semaphores, Monitors. Case study: process scheduling in Linux.

UNIT - II

Deadlocks & Memory Management :

Deadlock prevention, Deadlock Avoidance and Deadlock Detection and Recovery. Case Study: Unix, Windows2000 Concurrency Mechanisms. Segmentation, Demand Paging, Page Replacement Algorithms, Contiguous, Linked and Indexed Allocation, Case Study: Unix, Linux Memory management.

UNIT - III

Introduction to Distributed Systems & Communication in Distributed Systems

Introduction to Distributed Systems, Goals, Hardware Concepts, Software Concepts, Design issues of Distributed Systems. Communication in Distributed Systems, The Client Server Model, Remote Procedure Call, Group Communication, Case Study: Remote Procedure call in DCE.

UNIT – IV

Process Scheduling & Process Synchronization in Distributed Systems:

Processes and Processors in Distributed Systems, Processor Allocation, and Scheduling in Distributed Systems. Synchronization in Distributed Systems, Clock Synchronization, Mutual Exclusion, Election Algorithms, Atomic Transactions.

UNIT - V

Deadlock, Memory Management, Fault Tolerance and Recovery in Distributed Systems:

Deadlocks in Distributed Systems, distributed shared memory, Fault tolerance and recovery: basic concepts, fault models, agreement problems and its applications commit protocols, voting protocols, checkpointing and recovery, reliable communication.

TEXT BOOKS :

1. *Abraham Silberschatz, Peter Baer Galvin, Greg Gagne*, "Operating System Principles" , 7th ed., John Wiley & Sons Inc., 2006.
2. *Andrew S. Tanenbaum*, "Distributed Operating Systems", 1st ed., Pearson Education, 1995.

3. *Mukesh Singhal, Niranjan Shivaratri*, "Advanced Concepts in Operating Systems", *McGraw-Hill.*

REFERENCE BOOK :

1. *William Stallings*, "Operating Systems – Operating System: Internals and Design Principles", 4th ed. Prentice Hall, 2005.
2. *Nancy Lynch*, "Distributed Algorithms", Morgan Kaufmann.
3. *Jie Wu*, "Distributed Systems", CRC Press.
4. *Hagit Attiya, Jennifer Welch*, "Distributed Computing: Fundamentals, Simulations and Advanced Topics", McGraw-Hill.
5. *Sape Mullender*, "Distributed Systems", Addison-Wesley.