III Year I Semester	L	T	P	C
Code: 20CS5658	3	0	0	3

ADVANCED OPERATING SYSTEMS (Honors)

Course Objectives:

The course objectives of Operating Systems are to discuss and make student familiar with the

1. The architectures of distributed systems.
2. The mutual exclusion algorithms
3. Get the knowledge on Distributed Deadlock Detection techniques.
4. Multiprocessor System Architectures.
5. Understand Distributed Scheduling Distributed Shared Memory

Course Outcomes:

By the end of the course, the student will:

1. Understand the design approaches of advanced operating systems architectures.
2. Analyse the design issues of distributed mutual exclusion algorithms.
3. Analyse the deadlock situation in distributed systems.
4. Identify the requirements of distributed shared memory architectures and distributed file system.
5. Formulate the solutions to schedule the real time applications using load distributed algorithms and distributed shared memory algorithms.

UNIT - I

Architectures of Distributed Systems: System Architecture Types, Distributed Operating Systems, Issues in Distributed Operating Systems, Communication Primitives. Theoretical Foundations: Inherent Limitations of a Distributed System, Lamport's Logical Clocks, Vector Clocks, Causal Ordering of Messages, Termination Detection.

UNIT - II

Distributed Mutual Exclusion: The Classification of Mutual Exclusion Algorithms

Non-Token –Based Algorithms: Lamport's Algorithm, The Ricart-Agrawala Algorithm, Maekawa's Algorithm, ***Token-Based Algorithms:*** Suzuki-Kasami's Broadcast Algorithm, Singhal's Heurisric Algorithm, Raymond's Heuristic Algorithm.

UNIT - III

Distributed Deadlock Detection: Preliminaries, Deadlock Handling Strategies in Distributed Systems, Issues in Deadlock Detection and Resolution, Control Organizations for Distributed Deadlock Detection, Centralized- Deadlock – Detection Algorithms, Distributed Deadlock Detection Algorithms, Hierarchical Deadlock Detection Algorithms.

UNIT - IV

Multiprocessor System Architectures: Introduction, Motivation for multiprocessor Systems, Basic Multiprocessor System Architectures Multi Processor Operating Systems: Introduction, Structures of Multiprocessor Operating Systems, Operating Design Issues, Threads, Process Synchronization, Processor Scheduling.

Distributed File Systems: Architecture, Mechanisms for Building Distributed File Systems, Design Issues

UNIT - V

Distributed Scheduling: Issues in Load Distributing, Components of a Load Distributed Algorithm, Stability, Load Distributing Algorithms, Requirements for Load Distributing, Task Migration, Issues in task Migration.

Distributed Shared Memory: Architecture and Motivation, Algorithms for Implementing DSM, Memory Coherence, Coherence Protocols, and design Issues.

Text Books:

1. Advanced Concepts in Operating Systems, MukeshSinghal, Niranjan G. Shivaratri, Tata McGraw-Hill Edition 2001
2. Operating Systems Concepts & design - Milan Milenkovic, TMH

Reference Books:

1. Distributed Systems: Andrew S. Tanenbaum, Maarten Van Steen, Pearson Prentice Hall, Edition – 2, 2007
2. Pradeep K.Sinha,"Distributed operating system-Concepts and design", PHI, 2003.
3. Andrew S.Tanenbaum, "Distributed operating system", Pearson education, 2003.