

# GUJARAT TECHNOLOGICAL UNIVERSITY

## B.E. SEMESTER : VIII

### COMPUTER SCIENCE & ENGINEERING

Subject Name: **DISTRIBUTED SYSTEMS**

Sr. No.	Course Contents	Total Hrs
1.	<b>Concepts of Distributed Systems :</b> Introduction, Distributed computing models, Software concepts, Design issues in distributed systems, Client-server model, WWW 1.0 and 2.0	02
2.	<b>Network Communication:</b> LAN and WAN technologies, OSI Model and Internet protocols, ATM, Protocols for Distributed systems	04
3.	<b>Interprocess Communication:</b> Message Passing and its features, IPC message format, IPC synchronization, Buffering, multi datagram messaging, process addressing techniques, failure handling, Formal Models for message passing systems, Broadcast and converge cast on a spanning tree, Flooding and building a spanning tree, Constructing a DFS spanning tree with and without a specified root	10
4.	<b>Remote Communication:</b> Introduction, RPC basics, RPC implementation, RPC Communication and Other issues, Sun RPC, RMI basics, RMI Implementation, Java RMI	08
5.	<b>Synchronization:</b> Clock synchronization, Logical clocks, Global state, Mutual exclusion, Election algorithms: Bully algorithm, Ring algorithm, Leader election in rings, anonymous rings, Asynchronous rings, synchronous rings, election in wireless networks, Deadlocks in Distributed systems, Deadlocks in Message communication	10
6.	<b>Formal Model for Simulation:</b> Problem specification, Communication systems, asynchronous point to point message passing, asynchronous broadcast, Processes, Admissibility, Simulations	04
7.	<b>Distributed System Management:</b> Resource management, Task management approach, Load balancing approach, Load sharing approach, Process Management, Process migration, threads, fault tolerance	10
8.	<b>Distributed Shared Memory:</b> Concepts, Hardware DSM, Design issues in DSM systems, Implementation issues, Heterogeneous and other DSM systems, Case studies : Munin, Linda	06
9.	<b>Naming:</b> Overview, Features, Basic concepts, System oriented names, Object locating mechanisms, Issues in designing human oriented names, Name caches, Naming and security, DNS	06

#### Text Books:

1. Distributed Computing, Sunita Mahajan and Seema Shah, Oxford University Press
2. Distributed Computing, Fundamentals, Simulations and Advanced topics, 2<sup>nd</sup> Edition, Hagit Attiya and Jennifer Welch, Wiley India

#### Reference Books:

1. Distributed Systems: Principles and Paradigms, Taunenbaum
2. Distributed Systems: Concepts and Design, G. Coulouris, J. Dollimore, and T. Kindberg, Pearson Education