

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

COMPUTER SCIENCE & ENGINEERING

Subject Name: **DISTRIBUTED SYSTEMS**

| Sr. No. | Course Contents | Total Hrs |
|---------|---|-----------|
| 1. | Concepts of Distributed Systems : Introduction, Distributed computing models, Software concepts, Design issues in distributed systems, Client-server model, WWW 1.0 and 2.0 | 02 |
| 2. | Network Communication: LAN and WAN technologies, OSI Model and Internet protocols, ATM, Protocols for Distributed systems | 04 |
| 3. | Interprocess Communication: 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. | Remote Communication: Introduction, RPC basics, RPC implementation, RPC Communication and Other issues, Sun RPC, RMI basics, RMI Implementation, Java RMI | 08 |
| 5. | Synchronization: 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. | Formal Model for Simulation: Problem specification, Communication systems, asynchronous point to point message passing, asynchronous broadcast, Processes, Admissibility, Simulations | 04 |
| 7. | Distributed System Management: Resource management, Task management approach, Load balancing approach, Load sharing approach, Process Management, Process migration, threads, fault tolerance | 10 |
| 8. | Distributed Shared Memory: Concepts, Hardware DSM, Design issues in DSM systems, Implementation issues, Heterogeneous and other DSM systems, Case studies : Munin, Linda | 06 |
| 9. | Naming: 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, 2nd 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