



COMPUTER ENGINEERING



POSITIVE QUADRANT
TECHNOLOGIES
SERVING INFORMATION WORLDWIDE
SEM VIII

DISTRIBUTED COMPUTING

Programming & development

Course Curriculum



DISTRIBUTED COMPUTING SEM VIII

Module 1 : Introduction to Distributed Systems

- Characterization of Distributed Systems
 - Issues
 - Goals
 - Types of distributed systems
 - Distributed System Models
 - Hardware concepts
 - Software Concept
- Middleware
 - Models of Middleware
 - Services offered by middleware
 - Client Server model

Module 2: Communication



- Layered Protocols
- Interprocess communication (IPC)
 - MPI
 - Remote Procedure Call (RPC)
 - Remote Object Invocation
 - Remote Method Invocation (RMI)
- Message Oriented Communication
- Stream Oriented Communication
- Group Communication

Module 3: Synchronization

- Clock Synchronization
- Logical Clocks
- Election Algorithms
- Mutual Exclusion
- Distributed Mutual Exclusion-Classification of mutual Exclusion Algorithm
- Requirements of Mutual Exclusion Algorithms
- Performance measure



- Non Token based Algorithms
 - Lamport Algorithm
 - Ricart–Agrawala’s Algorithm
 - Maekawa’s Algorithm
- Token Based Algorithms
 - Suzuki-Kasami’s Broadcast Algorithms
 - Singhal’s Heuristic Algorithm
 - Raymond’s Tree based Algorithm
 - Comparative Performance Analysis

Module 4: Resource and Process Management

- Desirable Features of global Scheduling algorithm
- Task assignment approach
- Load balancing approach
- load sharing approach
- Introduction to process management
 - Process migration
 - Threads
 - Virtualization
 - Clients
 - Servers
 - Code Migration



Module 5: Consistency, Replication and Fault Tolerance

- Introduction to replication and consistency
- Data-Centric and Client-Centric Consistency Models
- Replica Management
- Fault Tolerance
 - Introduction
 - Process resilience
 - Reliable client-server and group communication
 - Recovery

Module 6: Distributed File Systems and Name Services

- Introduction and features of DFS



- File models
- File Accessing models
- File-Caching Schemes
- File Replication
- Case Study
 - Distributed File Systems (DSF)
 - Network File System (NFS)
 - Andrew File System (AFS)
- Introduction to Name services and Domain Name System
- Directory Services
- Case Study
 - The Global Name Service
 - The X.500 Directory Service
- Designing Distributed Systems
 - Google Case Study

