MCA 506A DISTRIBUTED SYSTEM / DISTRIBUTED TECHNOLOGY

Module-1

Distributed systems: Definition, goals, types of Distributed Systems, Architectures, Key characteristics, Design issues, naming, communication, software structure, workload allocation, consistency maintenance; User requirement, functionality, Quality of service, re configurability

Module-2

Interprocess communication, building blocks, client server communication; CORBA's Common Data Representation (CDR); Java object serialization; Extensible markup language (XML); Remote object references; Inter-process communication in UNIX; Remote procedure calling; Design issues, interface definition language exception handling; Implementation - interface processing, communication handling; Binding, Case study: sun RPC Vs. Java RMI

Module-3

Distributed Operating systems: kernel, processes and threads, Naming and protection - Communication and Invocation, virtual memory,

Distributed file services - design issues, interfaces, implementation techniques, Case study sun NFS, Name services: Name spaces; Name resolution, Domain Name System, SNS and DNS, Peer-to-Peer Systems.

Coordination and Agreement: Time and Global States, Time and co-ordination, Synchronizing physical clocks- logical time and logical clocks, Distributed co-ordination, distributed mutual exclusion, elections, Replication, basic architectural model, consistency and request ordering.

Module-4

Distributed Transactions, Recovery and fault tolerances: Transaction recovery, logging - shadow versions, fault model for transaction; Fault tolerance: characteristics; Hierarchical and group masking of faults; Security, authentication and key distribution, logic of authentication, digital signatures; Web Services: SOAP, XML, CORBA, Distributed object based systems, Distributed file systems, Distributed web- based systems, Distributed co-ordination based systems.

Module-5 (Portion covered can be tested through internal evaluation not to be included in the university examination

Text books:

1. George Coulouris, Jean Dollimore and Tim Kindberg, "Distributed Systems: Concepts and Design", Fourth Edition, 2006, Pearson Education, Inc. New Delhi.
2. Andrew S. Tanenbaum, Maarten van Steen, "Distributed Systems: Principles and Paradigms", 2nd Edition, 2007, PHI Learning Pvt. Ltd., New Delhi.

Reference books:

1. HagitAttiya, Jennifer Welch, "Distributed Computing: Fundamentals, Simulations, and Advanced Topics", 2nd Edition, 2005, Wiley India Pvt. Ltd., New Delhi.
2. Mordechai Ben-Ari, "Principles of Concurrent and Distributed Programming", 2nd Edition, 2006, Pearson Education, Inc. New Delhi.
3. Mei-Ling Liu, "Distributed Computing: Principles and Applications", 2004, Pearson Education, Inc. New Delhi.
4. Gerard Tel, "Introduction to Distributed Algorithms", Second edition, 2002, Cambridge University Press / Foundation Books India, New Delhi.
5. Ajay D. Kshemkalyani, MukeshSinghal, "Distributed Computing: Principles, Algorithms, and Systems", 2008, Cambridge University Press / Foundation Books India, New Delhi.