



MANIPAL UNIVERSITY JAIPUR

School of Computing and Information Technology

Department of Computer Science and Engineering
Course Hand-out

Distributed Systems | CS 1652 | 4 Credits

Session: 2015-2016 | Faculty: Umashakar Rawat

Course Outcomes: At the end of the course, students will be able to

- [1652.1] Describe and implement various communication mechanisms between different processes and systems.
- [1652.2] Describe and examine the naming conventions and name resolution mechanisms.
- [1652.3] Use algorithms to coordinate and synchronize multiple tasks in a distributed system.
- [1652.4] Identify how replication of resources improves performance and scalability in distributed systems, and examine algorithms that maintain consistent copies of replicas.
- [1652.5] Describe the common security issues in distributed systems and various mechanisms to secure the system.
- [1652.6] Apply principles of distributed systems in real-world applications like Distributed File Systems, Virtualization and hence enhance the employability skills

A. SYLLABUS

Introduction , Introduction concepts related to distributed computing and distributed operating systems. , Clients/Server Architecture , Communications , Communication via Message Passing and Various Message Passing Models, Hardware and Software Sides of C/S Architecture , File Server , Database Server , Transaction Processing , Centralized Processing , Distributed Processing , Logical Time, Physical Time and Local and Global State, Ordering of Messages (Causal Ordering) and Group Communication via Broadcasting of Messages, Termination Detection, Global Predicate Detection, Distributed Mutual Exclusion Algorithms, Distributed Deadlock Detection Algorithms, Distributed Shared Memory Systems, Check pointing and Rollback Recovery, Consensus and Agreement Algorithms, Failure Detection and Self Stabilization, etc. The design aspects of various advanced distributed computing models like Cluster of cooperative computers, Grid computing, Peer-to-Peer networks, and Internet of Things.

B. TEXT BOOKS

- i. G. Coulouris, J. Dollimore, T. Kindberg, "Distributed Systems, Concepts and Design", Pearson, 3rd Edition, 2001.
- ii. A. S. Tanenbaum, M. Van Steen, "Distributed Systems, Principles and Paradigms", Pearson, 1st Indian Reprint, 2002.

