

# GUJARAT TECHNOLOGICAL UNIVERSITY

## MASTER OF COMPUTER APPLICATION (COURSE CODE-6)

Year – II (Semester – IV) (W.E.F. 2013-14)

**Subject: Distributed Computing**

**Subject Code: 2640006**

### **Learning Objectives:**

- To be able to connect two machines
- To explore the client-server paradigm and implementation of simple client server applications
- To learn web services protocol

**Prerequisites:** Knowledge of the Core Java Programming and TCP/IP stack

### **Course Contents:**

Unit No.	Title	Lectures
1	<b>Distributed Computing</b> An Introduction, Definitions, The History of Distributed Computing, Different Forms of Computing, Strengths and Weaknesses of Distributed Computing, Basics of Operating Systems, Network Basics, The Architecture of Distributed Applications	(2 Lect.)
2	<b>Inter-process Communications</b> An Archetypal IPC Program Interface, Event Synchronization, Timeouts and Threading, Deadlocks and Timeouts, Data Representation, Data Encoding, Text-Based Protocols, Request-Response Protocols, Event Diagram and Sequence Diagram, Connection-Oriented versus Connectionless IPC	(5 Lect.)
3	<b>Distributed Computing Paradigms</b> Paradigms and Abstraction, An Example Application, Paradigms for Distributed Applications	(3 Lect.)
4	<b>The Socket API</b> Background, The Socket Metaphor in IPC, The Datagram Socket API, The Stream-Mode Socket API, Sockets With Nonblocking I/O Operations, Secure Socket API	(5 Lect.)
5	<b>The Client-Server Paradigm</b> Background, Client-Server Paradigm Issues, Software Engineering for a Network Service, Connection-Oriented and Connectionless Servers, Iterative Server and Concurrent Server, Stateful Servers	(6 Lect.)
6	<b>Group Communication</b> Unicasting versus Multicasting, An Archetypal Multicast API, Connectionless versus Connection Oriented Multicast, Reliable Multicasting versus Unreliable Multicasting, The Java Basic Multicast API, Reliable Multicast API	(4 Lect.)

7	<b>Distributed Objects</b> Message Passing versus Distributed Objects, An Archetypal Distributed Object Architecture, Distributed Object Systems, Remote Procedure Calls, Remote Method Invocation, The Java RMI Architecture, The API for the Java RMI, A Sample RMI Application, Steps for Building an RMI Application, Testing and Debugging, Comparison of RMI And Socket APIs	(4 Lect.)
8	<b>Internet Applications</b> Web Session and Session State Data	(2 Lect.)
9	<b>Introduction to XML and Web</b> XML Documents, Navigating XML Trees with XPath, Schema Languages, Querying XML Documents with XQuery	(6 Lect.)
10	<b>Web Services</b> The Simple Object Access Protocol (SOAP), JAX-WS, RESTFUL WEB SERVICES	(11 Lect.)

#### Main Reference Book(s):

- 1) M. L. Liu, "Distributed Computing Principles and Applications", Pearson Education
- 2) Mark Hansen, "SOA using JAVA Web Services", Prentice Hall
- 3) Anders Moller, "An Introduction to XML and Web Technologies", Pearson Education

#### Suggested Additional Reading:

- 1) Crichlow, "Distributed Systems: Computing over Networks", PHI
- 2) Tanenbaum, Sten, "Distributed Systems - Principles and Paradigms", PHI
- 3) Puder, "Distributed Systems Architecture - A Middleware Approach", Science & Technology Books
- 4) Lynch, "Distributed Algorithms" Science & Technology Books

#### Chapter wise Coverage from Main Reference Book(s):

Book #1 ->	Ch.. 1 to 7, 9, 10, 11 (according to the points included)
Book #2 ->	Ch. 2 to 4, 6
Book #3 ->	Ch. 3, 4 (upto 4.2)