III Year - I Semester	**L**	**T**	**P**	**C**
20CS5416	**3**	**0**	**0**	**3**

DISTRIBUTED COMPUTING
(OPEN ELECTIVE – I)

COURSE OBJECTIVES:
The course objectives of Distributed Systems are to discuss and make the student familiar with the
1. To expose students to both the abstraction and details of file systems.
2. To introduce concepts related to Inter process communication.
3. To focus on Distributed Objects and Remote Invocation.
4. To understand the concepts related to Operating System Support.
5. To expose students to current literature in Transactions & Replications

COURSE OUTCOMES:
By the end of the course, the students will:
1. Gain knowledge on characterization of distributed systems
2. Gain knowledge on Inter-process communication.
3. Understands the operation process of distributed objects & remote invocation
4. Understands operating systems support for distributed computing.
5. Understands transaction process & recovery in a distributed environment.

UNIT-I
Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations, Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model.

UNIT-II
Interprocess Communication: Introduction, The API for the Internet Protocols- The Characteristics of Interprocess communication, Sockets, UDP Datagram Communication, TCP Stream Communication; External Data Representation and Marshalling; Client Server Communication; Group Communication- IP Multicast- an implementation of group communication, Reliability and Ordering of Multicast.

UNIT-III
Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects- Object Model, Distributed Object Modal, Design Issues for RMI, Implementation of RMI, Distributed Garbage Collection; Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI

UNIT-IV
Operating System Support: Introduction, the Operating System Layer, Protection, Processes and Threads –Address Space, Creation of a New Process,Threads.
Distributed File Systems: Introduction, File Service Architecture; Peer-to-Peer Systems: Introduction, Napster and its Legacy, Peer-to-Peer Middleware, Routing Overlays. Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication

UNIT-V

Transactions & Replications: Introduction, System Model and Group Communication, Concurrency Control in Distributed Transactions, Distributed Dead Locks, Transaction Recovery; Replication- Introduction, Passive (Primary) Replication, Active Replication.

TEXT BOOKS:
1. Ajay D Kshemkalyani, MukeshSighal, "Distributed Computing, Principles, Algorithms and Systems",Cambridge
2. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems- Concepts and Design", Fourth Edition, Pearson Publication

REFERENCE BOOKS
1. Distributed-Systems-Principles-Paradigms-Tanenbaum PHI