III Year-I Semester
(20CS5416) Distributed Computing
(Open Elective-I)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	-	-	3

Pre- Requisites: None

Course Objectives:
The course objectives of Distributed Systems are to discuss and make the student familiar with the

- To expose students to both the abstraction and details of file systems.
- To introduce concepts related to Inter process communication.
- To focus on Distributed Objects and Remote Invocation.
- To understand the concepts related to Operating System Support.
- To expose students to current literature in Transactions & Replications

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.

Course Outcomes:

S.No	Course Outcomes	BTL
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	

Text Books:

1. Ajay D Kshemkalyani, Mukesh Sighal, "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