

DISTRIBUTED COMPUTING SYSTEM
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)

SEMESTER – VI

Subject Code	15CS654	IA Marks	20
Number of Lecture Hours/Week	3	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03

CREDITS – 03

Course objectives: This course will enable students to

- Explain distributed system, their characteristics, challenges and system models.
- Describe IPC mechanisms to communicate between distributed objects
- Illustrate the operating system support and File Service architecture in a distributed system
- Analyze the fundamental concepts, algorithms related to synchronization.

Module – 1

Teaching Hours

Characterization of Distributed Systems: Introduction, Examples of DS, Resource sharing and the Web, Challenges
System Models: Architectural Models, Fundamental Models

8 Hours

Module – 2

Inter Process Communication: Introduction, API for Internet Protocols, External Data Representation and Marshalling, Client – Server Communication, Group Communication

8 Hours

Distributed Objects and RMI: Introduction, Communication between Distributed Objects, RPC, Events and Notifications

Module – 3

Operating System Support: Introduction, The OS layer, Protection, Processes and Threads, Communication and Invocation, Operating system architecture
Distributed File Systems: Introduction, File Service architecture, Sun Network File System

8 Hours

Module – 4

Time and Global States: Introduction, Clocks, events and process status, Synchronizing physical clocks, Logical time and logical clocks, Global states
Coordination and Agreement: Introduction, Distributed mutual exclusion, Elections

8 Hours

Module – 5

Distributed Transactions: Introduction, Flat and nested distributed transactions, Atomic commit protocols, Concurrency control in distributed transactions, distributed deadlocks

8 Hours

Course outcomes: The students should be able to:

- Explain the characteristics of a distributed system along with its and design challenges
- Illustrate the mechanism of IPC between distributed objects
- Describe the distributed file service architecture and the important characteristics of SUN NFS.
- Discuss concurrency control algorithms applied in distributed transactions

Question paper pattern:

The question paper will have TEN questions.

There will be TWO questions from each module.

Each question will have questions covering all the topics under a module.

The students will have to answer FIVE full questions, selecting ONE full question from each module.

Text Books:

1. George Coulouris, Jean Dollimore and Tim Kindberg: Distributed Systems – Concepts and Design, 5th Edition, Pearson Publications, 2009

Reference Books:

1. Andrew S Tanenbaum: Distributed Operating Systems, 3rd edition, Pearson publication, 2007
2. Ajay D. Kshemkalyani and Mukesh Singhal, Distributed Computing: Principles, Algorithms and Systems, Cambridge University Press, 2008
3. Sunita Mahajan, Seema Shan, “ Distributed Computing”, Oxford University Press, 2015



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