

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			
<ul style="list-style-type: none"> • 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			8 Hours
System Models: Architectural Models, Fundamental Models			
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			8 Hours
Distributed File Systems: Introduction, File Service architecture, Sun Network File System			
Module – 4			
Time and Global States: Introduction, Clocks, events and process status, Synchronizing physical clocks, Logical time and logical clocks, Global states			8 Hours
Coordination and Agreement: Introduction, Distributed mutual exclusion, Elections			
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:			
<ul style="list-style-type: none"> • 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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