

Distributed Computing System

Teaching Scheme:3
Lectures/week

Credits: 3

Examination Scheme:

In-Semester : 30 Marks

End-Semester: 70 Marks

Prerequisites:

1. Web Technology, Computer Network Technology and Operating System.

Course Objectives :

1. To understand the fundamentals and knowledge of the architectures of distributed systems.
2. To gain knowledge of working components and fault tolerance of distributed systems
3. To make students aware about security issues and protection mechanism for distributed environment.

Course Outcomes :

By the end of the course, students should be able to

1. Understand the principles and desired properties of distributed systems based on different application areas.
2. Understand and apply the basic theoretical concepts and algorithms of distributed systems in problem solving.
3. Recognize the inherent difficulties that arise due to distributed-ness of computing resources.
4. Identify the challenges in developing distributed applications

UNIT – I FUNDAMENTALS AND ARCHITECTURES:

6 Hrs

INTRODUCTION(Text. Book-1 and Text. Book-2): Characteristics and examples of distributed systems, Design goals, Types of distributed systems, Trends in distributed systems, Focus on Resource Sharing, Challenges.

ARCHITECTURES(Text. Book-1 and Text. Book-2): Architectural styles, middleware and middleware organization, system architectures, Example architectures.

Case Study: The World Wide Web(Reference. Book-1)::

UNIT – II COMMUNICATION AND COORDINATION

6 Hrs

COMMUNICATION Text. Book-1):: Introduction, Layered protocols , Types of communication, Inter-process Communication, Remote Procedure Call (RPC), Message oriented communication, Multicast Communication, Network Virtualization: Overlay Network

COORDINATION(Text. Book-1):: Clock Synchronization, Logical Clocks, Mutual Exclusion, Election algorithms, Distributed event matching, Gossip Based coordination

Case Study: IBM's Websphere Message-Queuing System(Text. Book-1)

UNIT - III REPLICATION AND FAULT TOLERANCE

6 Hrs

REPLICATION(Text. Book-1):: Reasons for replication, Replica management, Failure masking and replication, Consistency protocols, Catching and replication in web,

Text Books

Sr. No.	Title	Author (s)	Publisher	Edition	Publication Year	ISBN No.	Price (Rs.)
1	Distributed Systems	Maarten van Steen , Andrew S. Tanenbaum	PHI	3rd Edition Version 3.01	2017	978-15-430573-8-6 (Printed)	Digital version Free on net
2	Distributed Systems – Principles and Paradigms	Andrew S. Tanenbaum, Maarten van Steen	PHI	2 nd Edition	2013	978-0130888938	Digital version free on Net

Reference Books

Sr. No.	Title	Author (s)	Publisher	Edition	Publication Year	ISBN No.	Price (Rs.)
1.	Distributed Systems: Concepts and Design	George Coulouris, Jean Dollimore, Tim Kindberg, Gordon Blair,	Pearson	5 th edition	2011	ISBN-13: 978-0132143011 ISBN-10: 0132143011	---
2.	Distributed System Security: Issues, Processes and solutions	Abhijit Belapurkar, Anirban Chakrabarti, Harigopal Ponnappalli, Niranjan Varadarajan, Srinivas Padmanabhuni, Srikanth Sunderrajan	Willey online Library	-----	2009	ISBN: 978-0-470-51988-2	-----
3.	Distributed Computing	Sunita Mahajan, Seema Shah,	Oxford University Press	2nd Edition	2013	ISBN-13: 978-0198093480	----