PVP20

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY

(Autonomous)

Kanuru, Vijayawada-520007

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI & ML)

III B. Tech – II Semester CSE (AI&ML)

Distributed Systems

Course Code	20AM4601C	**Year**	III	**Semester**	II
Course Category	PEC	**Branch**	CSE (AI&ML)	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Operating Systems, Computer Networks
Continuous Internal Evaluation	30	**Semester End Examination**	70	**Total Marks**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1	Describe the fundamental principles, characteristics, and models of distributed systems	**L2**
CO2	Apply different approaches and techniques for enabling communication and coordination in distributed systems	**L3**
CO3	Apply various middleware technologies in designing Distributed systems	**L3**
CO4	Analyze the sharing of data in a distributed environment using various distributed algorithms	**L4**

Contribution of Course Outcomes towards achievement of Program Outcomes& Strength of correlations (3: High,2: Medium, 1: Low)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2													
CO2	3													
CO3	3											1		
CO4		3										1		

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Characterization Of Distributed Systems:** Introduction, Examples of Distributed Systems, Trends in Distributed Systems, Focus on Resource Sharing, Challenges **System Models:** Introduction, Physical models, Architectural models, Fundamental models.	CO1, CO2
II	**Interprocess Communication:** Introduction, The API for the Internet Protocols, External Data Representation and Marshaling, Multicast Communication Network virtualization: Overlay Networks. **Remote Invocation:** Introduction, Request-Reply Protocols, Remote Procedure Call, Remote Method Invocation. **Indirect Communication:** Introduction, Group Communication, Publish-Subscribe Systems, Message Queues, Shared Memory Approaches.	CO1, CO2
III	**Operating System Support:** Introduction, The Operating System Layer, Protection, Processes and Threads, Communication and Invocation, Operating System Architecture, and Virtualization at the Operating System Level. **Distributed Objects and Components:** Introduction, Distributed Objects, Case study: CORBA, From Objects to Components.	CO1, CO3
IV	**Time And Global States:** Introduction, Clocks, Events, and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging **Coordination And Agreement:** Introduction, Distributed Mutual Exclusion, Elections, Coordination and Agreement in Group Communication, Consensus and related problems	CO1, CO3, CO4
V	**Distributed Transactions:** Introduction, Flat and Nested Distributed transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery **Replication**: Introduction, System Model and the Role of Group Communication, Fault-Tolerant Services.	CO1, CO4

Learning Resources
Text Books
1. Distributed System: Concepts and Design, Coulouris, Dollimore, Kindberg, 2017, Pearson Education.
Reference Books
1. Distributed Operating System, Tanenbaum S, 2005, Pearson Education. 2. Distributed System: Concepts and Design, P K Sinha, 2008, PHI. 3. Advanced Concepts in Operating Systems, Mukesh Singhal & Niranjan G Shivaratri, 2017, Tata McGraw Hill
e- Resources & other digital material
1. www.distributedsystemscourse.com 2. https://ocw.mit.edu/ 3. https://cgi.luddy.indiana.edu/~prateeks/dist-sys-course.html 4. https://archive.nptel.ac.in/courses/106/106/106106168/ 5. https://onlinecourses.nptel.ac.in/noc21_cs87/preview