Distributed Systems

Course Code	19CS4501D	Year	III Semester		I	
Course Category	Program Elective-I	Branch	CSE	Course Type	Theory	
Credits 3		L-T-P 3-0-0		Prerequisites	Operating Systems	
Continuous Internal Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100	

Course Outcomes					
Upon suc	cessful completion of the course, the student will be able to				
CO1	Understand of the principles and foundations on which the Internet and other distributed systems are based.	L2			
CO2	Apply different approaches for supporting distributed applications.	L3			
CO3	Analyze the role of middleware technologies in designing Distributed systems	L4			
CO4	Analyze the sharing of data in distributed environment using various distributed algorithms.	L4			

	Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3													
CO2	3													2
CO3		3							3	3			1	
CO4		3												2

	Syllabus					
Unit No.	Contents					
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				
Ш	Inter process Communication: Introduction, The API for the Internet protocols, External data representation and marshalling, 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, Virtualization at the operating system level. Distributed Objects and Components: Introduction, Distributed objects, Case study: CORBA, From objects to components.					
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,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 R	Resources
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Text Book

1. Distributed System: Concepts and Design, Coulouris, Dollimore, Kindberg, 2006, Pearson Education.

References

- 1. Distributed Operating System, Tanenbaum S, 2005, Pearson Education.
- 2. Distributed System: Concepts and Design, P K Sinha, 2004, PHI.
- 3. Advanced Concepts in Operating Systems, Mukesh Singhal & Niranjan G Shivaratri, 2001, Tata McGraw Hill.

e-Resources and other Digital Material

- 1. https://www.cdk5.net/wp/
- 2. <u>www.distributedsystemscourse.com</u>
- 3. https://ocw.mit.edu/