SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

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Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
16CS7T01	Distributed Systems	VII	CSE (A, B & Shift)	5	2020-2021	

COURSE OUTCOMES	
1	Define the concept of distributed systems and various distributed models. (K1).
2	Analyze inter-process communication mechanisms used in distributed systems. (K2).
3	Describe the knowledge on RPC and RMI. (K2).
4	Explain the process of Synchronization and Replication. (K3).
5	Define distributed file systems and name services. (K1).
6	Explain distributed transactions and concurrency control. (K2).

Unit	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
UNIT-I: Characterization of Distributed Systems & System Models						
I	CO1: Define the concept of distributed systems and various distributed models. (K1).	1.1.1	Characterization of Distributed Systems Introduction	T1	1	Chalk ,talk
		1.1.2	Examples of Distributed Systems	T1	1	Chalk ,talk
		1.1.3	Resource Sharing and the Web	T1	1	Chalk ,talk
		1.1.4	Challenges.	T1	1	Chalk ,talk
		1.2.1	System Models Introduction	T1	1	Chalk ,talk
		1.2.2	Physical Models	T1	1	Chalk ,talk
		1.2.3	Architectural Models	T1	1	PPT
		1.2.4	Fundamental Models	T1	1	Chalk ,talk PPT
		1.2.4.1	Interaction model			
		1.2.4.2	Failure model	T1	1	Chalk ,talk PPT
		1.2.4.3	Security model	T1	1	Chalk ,talk PPT
	Content beyond Syllabus (if needed)		The Evolution of Distributed Systems on Kubernetes	W1	1	PPT

			Total		**11**	
UNIT-II: Inter Process Communication (IPC)						
II	CO2: Analyze inter-process communication mechanisms used in distributed systems. (K2).	2.1.1	Introduction	T1	1	Chalk, talk
		2.1.2	The API for the Internet Protocols	T1	1	Chalk, talk
		2.1.2.1	The characteristics of IPC	T1		Chalk, talk
		2.1.2.2	Sockets	T1	1	Chalk, talk
		2.1.2.3	UDP datagram communication	T1	1	Chalk, talk
		2.1.2.4	TCP stream communication	T1	1	Chalk, talk
		2.1.3	External Data Representation and Marshalling	T1	1	Chalk, talk PPT
		2.1.3.1	CORBA's Common Data Representation (CDR)	T1		Chalk, talk PPT
		2.1.3.2	Java object serialization	T1	1	Chalk, talk
		2.1.3.3	Extensible Markup Language (XML)	T1	1	Chalk, talk
		2.1.3.4	Remote object references	T1		Chalk, talk
		2.1.4	Client-Server Communication	T1	1	Chalk, talk
		2.1.5	Group Communication	T1		Chalk, talk
		2.1.6	Case Study: IPC in UNIX	T1, R1	1	Chalk, talk
	Content beyond Syllabus (if needed)		An Introduction to Linux IPC Facilities	W2	1	Video
Total					**11**	
UNIT-III: Distributed Objects and Remote Invocation						
III	CO3: Describe the knowledge on RPC and RMI. (K2).	3.1.1	Introduction	T1	1	Chalk, talk
		3.1.2	Communication between Distributed Objects	T1, R1	1	Chalk, talk
		3.1.3	Object Model	T1	1	Chalk, talk
		3.1.4	Distributed Object Model,	T1	1	Chalk, talk
		3.1.5	Design Issues for RMI	T1	1	Chalk, talk
		3.1.6	Implementation of RMI	T1	1	Chalk, talk
		3.1.7	Distributed Garbage Collection	T1	1	Chalk, talk
		3.1.8	Remote Procedure Call	T1	1	Chalk, talk
		3.1.9	Events and Notifications	T1	1	Chalk, talk
		3.1.10	Case Study: JAVARMI	T1	1	Chalk, talk , PPT
	Content beyond Syllabus (if needed)		Building distributed systems with RMI	W3	1	PPT
			Total		**11**	

UNIT-IV: Synchronization and Replication						
IV	CO4: Explain the process of Synchronization and Replication. (K3).	4.1.1	Introduction to Synchronization	T1, R1	1	Chalk, talk
		4.1.2	Clocks, Events and process states	T1, R1		Chalk, talk
		4.1.3	Synchronizing physical clocks	T1, R1	1	Chalk, talk
		4.1.4	Logical time and logical clocks	T1, R1	1	Chalk, talk PPT
		4.1.5	Global states	T1, R1	1	Chalk, talk
		4.1.6	Coordination and Agreement	T1, R1	1	Chalk, talk
		4.1.7	Introduction - Distributed mutual exclusion – Elections.	T1, R1	1	Chalk, talk
		4.2.1	Introduction to Replication	T1, R1, R2	1	Chalk, talk
		4.2.2	System model and the role of group communication	T1, R1, R2	1	Chalk, talk
		4.2.3	fault tolerant services	T1, R1, R2	1	Chalk, talk PPT
		4.2.4	Transactions with replicated data.	T1, R1, R2	1	Chalk, talk
	Content beyond Syllabus (if needed)		Highly Distributed Computations Without Synchronization		1	Video
				Total	**11**	
UNIT-V: Distributed File Systems & Name Services						
V	CO5: Define distributed file systems and name services. (K1).	5.1.1	Introduction to DFS	T1	1	Chalk, talk
		5.1.1.1	Characteristics of file systems	T1		Chalk, talk
		5.1.1.2	Distributed file system requirements	T1		Chalk, talk
		5.1.1.3	Case studies	T1	1	Chalk, talk
		5.1.2	File Service Architecture	T1		Chalk, talk
		5.1.3	Case Study 1: Sun Network File System	T1	1	Chalk, talk
		5.1.4	Case Study 2: The Andrew File System.	T1	1	Chalk, talk
		5.1.4.1	Implementation	T1	1	Chalk, talk
		5.1.4.2	Cache consistency	T1	1	Chalk, talk
		5.2.1	Introduction to Name Services	T1	1	PPT,talk
		5.2.1.1	Names, addresses and other attributes	T1		Chalk, talk
		5.2.2	Name Services and the Domain Name System	T1	1	Chalk, talk

		5.2.2.1	Name spaces	T1	1	Chalk, talk
		5.2.2.2	Name resolution	T1		Chalk, talk
		5.2.2.3	The Domain Name System	T1		Chalk, talk
		5.2.3	Directory Services	T1		Chalk, talk
		5.2.4	Case Study of the Global Name services	T1	1	Chalk, talk
	Content beyond Syllabus (if needed)		Installing A NFSv4 Server	W5	1	PPT
				Total	**11**	
UNIT-VI: Transactions and Concurrency Control & Distributed Transactions						
VI	CO6: Explain distributed transactions and concurrency control. (K2).	6.1.1	Transactions and Concurrency Control Introduction, Transactions	T1	1	Chalk, talk
		6.1.2	Nested Transactions, Locks	T1	1	Chalk, talk
		6.1.3	Optimistic Concurrency Control	T1	1	Chalk, talk
		6.1.4	Timestamp Ordering	T1	1	Chalk, talk
		6.1.5	Comparison of Methods for Concurrency Control	T1	1	Chalk, talk
		6.2.1	Distributed Transactions Introduction, Flat and Nested Distributed Transactions	T1	1	Chalk, talk, PPT
		6.2.2	Atomic Commit Protocols	T1	1	Chalk, talk
		6.2.3	Concurrency Control in Distributed Transactions	T1	1	Chalk, talk
		6.2.4	Distributed Deadlocks	T1	1	Chalk, talk
		6.2.5	Transaction Recovery	T1	1	Chalk, talk
	Content beyond Syllabus (if needed)		Comparing Distributed Transaction Architectures for the Cloud Era	W6	1	Video
				Total	**11**	
				CUMULATIVE PROPOSED PERIODS	**66**	

Text Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	George Coulouris ,, J Dollimore and Tim Kindberg ,Distributed Systems, Concepts and Design, Pearson Education, 5th Edition. 2012.

Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Andrew S. Tanenbaum, Maarten Van Steen ,Distributed Systems, Principles and Paradigms, , PHI, 2nd Edition, 2006.
2	Sukumar Ghosh ,Distributed Systems, An Algorithm Approach, , Chapman & Hall/CRC, Taylor

	& Fransis Group, 2nd Edition, 2015.
Web Details	
1	https://www.infoq.com/presentations/kubernetes-primitives-design-patterns/
2	https://www.youtube.com/watch?v=vU2HDf5ZhO4
3	http://lig-membres.imag.fr/bouchena/teaching/IBD/lectures/C2-RMI.pdf
4	https://www.infoq.com/articles/Highly-Distributed-Computations-Without-Synchronization/
5	https://www.tecmint.com/installing-network-services-and-configuring-services-at-system-boot/
6	https://www.youtube.com/watch?v=w_zYYF3-iSo

		Name	Signature with Date
i.	Faculty		
ii.	Faculty II (for common Course)	Dr. T. PARAMESWRAN	
iii.	Faculty III (for common Course)	Mr. K. RAJESH KUMAR	
iv.	Course Coordinator	Dr. T. PARAMESWRAN	
v.	Module Coordinator	Mr.N.Tulasi Raju	
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Principal