FACULTY OF ENGINEERING & TECHNOLOGY

First Year Master of Technology

Semester I

Course Code: 102310101

Course Title: Distributed Systems

Type of Course: Program Elective II

Course Objectives: Students will learn basic concepts and paradigms of distributed systems. Students will learn how to combine computational power of multiple computers to solve complex computational problems.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Internal		External		Total
Lecture	Tutorial	Practical		Theory	J/V/P*	Theory	J/V/P*	
3	0	2	4	30 / 15	20 / 10	70 / 35	30 / 15	150 / 75

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	Introduction to Distributed Computing Systems: Evolution of distributed computing systems, Distributed computing systems models, issues in the design of distributed operating systems.	7
2	Inter-process Communication in Distributed Systems: Message passing, synchronization, buffering, failure handling, group communication.	6
3	Remote Procedure Calls: Remote Procedure Call (RPC) models, transparency of RPC, RPC messages, marshaling arguments and results, exception handling, lightweight RPC.	6
4	Distributed Shared Memory: General architecture of Distributed Shared Memory (DSM), granularity, replacement strategies, thrashing.	7
5	Distributed Process Management: Synchronization – clock synchronization, event ordering, mutual exclusion; election algorithm, process migration, threads.	7
6	Distributed File System: File accessing models, file-sharing semantics, file-caching semantic, case-study: Network file systems.	7

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks						**R**: Remembering; **U**: Understanding; **A**: Application, **N**: Analyze; **E**: Evaluate; **C**: Create
R	U	A	N	E	C	
20%	30%	30%	10%	5%	5%	

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Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1	P.K. Sinha, Distributed Operating Systems, Concept and Design, Prentice Hall of India, 1997.
2	A.S Tannenbaum, M.V. Steen, Distributed Systems, Principles and Paradigms, Prentice Hall of India, 2002. 3. Vijay K. Garg, Elements of Distributed Computing Wiley – IEEE 2002.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Understand the Evolution and Issues of Distributed system	**15**
CO-2	Understand the concepts of Inter process communication and Remote Procedure Call in Distributed Environment.	**30**
CO-3	Understand the concept of Distributed process management.	**30**
CO-4	Understand the concept of Distributed File System	**25**

List of Practicals / Tutorials:

1	Write a program to implement hello world service using RMI
2	Write a program to implement calculator using RMI
3	Write a program to implement time service using RMI
4	Write a program to implement hello world service using RPC
5	Write a program to implement date service using RPC
6	Write a program to implement Echo SOCKET in JAVA
7	Write a program to implement Echo server using RPCGEN
8	Write a program to implement producer-consumer concept using THREAD
9	Write a program to find the length of string using THREAD
10	Experiments on Hadoop Distributed File System
11	Infinite Sequence, Infinite Series, Geometric Series, Telescoping Series, The nth term test for a Divergent Series. The Integral Test, Comparison Tests, D Alembert's Ratio Test and Cauchy's Root Test
12	Alternating Series, Absolute and Conditional Convergence, Power Series and Convergence, The Radius and Interval of Convergence of a Power Series

Supplementary learning Material:	
1	NPTEL Distributed Computing Systems : https://nptel.ac.in/courses/106/106/106106107/
2	NPTEL Distributed Systems: https://nptel.ac.in/courses/106/106/106106168/

Curriculum Revision:	
Version:	**1**
Drafted on (Month-Year):	Apr-20
Last Reviewed on (Month-Year):	Jul-20
Next Review on (Month-Year):	Apr-22

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