

DISTRIBUTED SYSTEMS

I Semester: CSE																							
Course Code	Category	Hours / Week			Credits	Maximum Marks																	
BCSC08	Elective	L	T	P	C	CIA	SEE	Total															
		3	0	0	3	30	70	100															
Contact Classes: 45		Total Tutorials: Nil		Total Practical Classes: Nil		Total Classes: 45																	
<p>I. COURSE OVERVIEW: Distributed systems help students aggregate the resources of many networked computers to construct highly available and scalable services. The abstractions, design and implementation techniques that enable the building of fast, scalable, fault-tolerant distributed systems.</p> <p>II COURSE OBJECTIVES: The students will try to learn:</p> <ol style="list-style-type: none"> I. The fundamental concepts and issues of managing large volume of shared data in a parallel and distributed environment. II. The insight into related research problems. III. The principles, architectures, algorithms and programming models used in distributed systems. IV. The state-of-the-art distributed systems, such as Google File System. V. The importance of distribute systems and also know about how to implement sample distributed systems. <p>III. COURSE OUTCOMES: After successful completion of the course, students should be able to</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="text-align: center;">CO 1</td> <td>Understand the design principles in distributed systems and the architectures for distributed systems.</td> <td style="text-align: center;">Understand</td> </tr> <tr> <td style="text-align: center;">CO 2</td> <td>Apply various distributed algorithms related to clock synchronization, concurrency control, deadlock detection, load balancing, voting in distributed databases.</td> <td style="text-align: center;">Apply</td> </tr> <tr> <td style="text-align: center;">CO 3</td> <td>Analyze fault tolerance and recovery in distributed systems and algorithms.</td> <td style="text-align: center;">Analyze</td> </tr> <tr> <td style="text-align: center;">CO 4</td> <td>Analyze the design and functioning of existing distributed systems and file systems.</td> <td style="text-align: center;">Analyze</td> </tr> <tr> <td style="text-align: center;">CO 5</td> <td>Develop different distributed algorithms over current distributed platforms.</td> <td style="text-align: center;">Apply</td> </tr> </tbody> </table> <p>IV. SYLLABUS</p> <p>MODULE-I: INTRODUCTION (10) Distributed data processing; What is a DDBS; Advantages and disadvantages of DDBS; Problem areas; Overview of database and computer network concepts. DISTRIBUTED DATABASE MANAGEMENT SYSTEM ARCHITECTURE Transparencies in a distributed DBMS; Distributed DBMS architecture; Global directory issues.</p> <p>MODULE-II: DISTRIBUTED DATABASE DESIGN (10) Alternative design strategies; Distributed design issues; Fragmentation; Data allocation. Semantics Data Control, View management; Data security; Semantic Integrity Control. QUERY PROCESSING ISSUES Objectives of query processing; Characterization of query processors; Layers of query processing; Query decomposition; Localization of distributed data.</p> <p>MODULE-III: DISTRIBUTED QUERY OPTIMIZATION (08) Factors governing query optimization; Centralized query optimization; Ordering of fragment queries; Distributed query optimization algorithms. Transaction Management: The transaction concept; Goals of transaction management; Characteristics of transactions; Taxonomy of transaction models.</p>									CO 1	Understand the design principles in distributed systems and the architectures for distributed systems.	Understand	CO 2	Apply various distributed algorithms related to clock synchronization, concurrency control, deadlock detection, load balancing, voting in distributed databases.	Apply	CO 3	Analyze fault tolerance and recovery in distributed systems and algorithms.	Analyze	CO 4	Analyze the design and functioning of existing distributed systems and file systems.	Analyze	CO 5	Develop different distributed algorithms over current distributed platforms.	Apply
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CONCURRENCY CONTROL

Concurrency control in centralized database systems; Concurrency control in DDBSs; Distributed concurrency control algorithms; Deadlock management.

MODULE-IV: RELIABILITY (09)

Reliability issues in DDBSs; Types of failures; Reliability techniques; Commit protocols; Recovery protocols.

MODULE-V: PARALLEL DATABASE SYSTEMS (08)

Parallel architectures; parallel query processing and optimization; load balancing

V. TEXT BOOKS:

1. M.T. Ozsu and P. Valduriez, "Principles of Distributed Database Systems", Prentice-Hall, 1991.
2. D. Bell and J. Grimson, "Distributed Database Systems", Addison-Wesley, 1992.

VI. REFERENCE BOOKS:

1. I. A. Dhotre, "Distributed Databases", Technical publishers, 2020.

VII. WEB REFERENCES:

1. <http://www.tutorialspoint.com/r/>
2. https://en.wikipedia.org/wiki/R_programming_language.
3. <http://www.r-bloggers.com/how-to-learn-r-2/#h.obx6jyuc9j7t>.

VIII. E-Text Books:

1. <https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf>
2. <https://www.cs.bris.ac.uk/~flach/mlbook/>.
3. <http://mylovelibrary.com/emylibraryus/free.php?asin=1466583282>.