DISTRIBUTED SYSTEMS

I Semester: CSE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
BCSB07	**Elective**	3	0	0	3	30	70	100

Contact Classes: 45	Total Tutorials: Nil	Total Practical Classes: Nil	Total Classes: 45

I. COURSE OVERVIEW:

The course provides a solid foundation in the fundamental concepts of distributed database design and distributed query optimization. Additionally, the course covers parallel query processing and optimization techniques, equipping students with the knowledge to effectively handle large-scale data processing in distributed environments.

II. OBJECTIVES:

The students will try to learn:

I. The fundamental concepts and issues of managing large volume of shared data in a parallel and distributed environment

II. Insight into related research problems

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	**Summarize** various issues raised in usage of distributed database in location transparency application.	Evaluate
CO 2	**Outline** the design of a distributed databases in semantic data control and issues raised in query processing.	Analyze
CO 3	**Identify** various factors used in distributed query optimization in transaction managements & concurrency control.	Apply
CO 4	**Summarize** different types of failures, reliability issues and recovery protocols to improve performance of system.	Evaluate
CO 5	**Apply** parallel distributed systems in applications of internet and peer to peer network applications.	Apply

IV. SYLLABUS:

UNIT-I	INTRODUCTION	Classes: 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.

UNIT-II	DISTRIBUTED DATABASE DESIGN	Classes: 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.

UNIT-III	DISTRIBUTED QUERY OPTIMIZATION	Classes: 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.

CONCURRENCY CONTROL

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

UNIT-IV	**RELIABILITY**	**Classes: 09**

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

UNIT-V	**PARALLEL DATABASE SYSTEMS**	**Classes: 08**

Parallel architectures; parallel query processing and optimization; load balancing

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.

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.

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://mylovelibrabry.com/emylibraryus/free.php?asin=1466583282.