GUJARAT TECHNOLOGICAL UNIVERSITY
INFORMATION TECHNOLOGY
B. E. SEMESTER: VII

Subject Name: **Distributed Database Application & System**
Subject Code: **171602**

Teaching Scheme				Evaluation Scheme			
Theory	**Tutorial**	**Practical**	**Total**	**University Exam (E)**		**Mid Sem Exam (Theory) (M)**	**Practical (Internal)**
				Theory	**Practical**		
3	0	2	5	70	30	30	20

Sr. No.	Course Contents	Total Hrs
1.	**Introduction.** File Systems, Database Management, Motivation, Distributed Computing, Distributed Computing & What is distributed, What is a Distributed Database System?, What is not a DDBS?, Centralized DBMS on a Network, Distributed DBMS Environment, Implicit Assumptions, Shared-Memory Architecture, Shared-Disk Architecture, Shared-Nothing Architecture, Applications, Distributed DBMS Promises of DDBS, Transparent Management of Distributed and Replicated data, Transparencies, Distributed Database - User View, Distributed DBMS – Reality, Potentially Improved Performance, Complicating Factors, Problem Areas, Parallelism Requirements, System Expansion, Distributed DBMS Issues, Distributed DBMS Issues, Relationship Between Issues	10
2.	**Overview of Relational DBMS.** Relational database Concepts, normalization, Integrity Rule, Relational data Languages, Relational DBMS	04
3.	**Review of Computer Networks.** Data Communication Concepts, Types of Networks, Protocol Standards, Broadband Networks Wireless Networks, Internet	06
4.	**Distributed DBMS Architecture.** Architecture, ANSI/SPARC Architecture, Standardization, Conceptual Schema Definition, Conceptual Schema Definition, Internal Schema Definition, External View Definition - Example 1, External View Definition -	10

	Example 2, DBMS implementation Alternatives, Dimensions of the Problem, Data logical Distributed DBMS Architecture, Data logical Multi-DBMS Architecture, Timesharing Access to a Central Database, Multiple Clients/Single Server , Task Distribution , Advantages of Client-Server Architectures, Problems With Multiple-Client/Single Server, Multiple Clients/Multiple Servers, Server-to-Server, Peer-to-Peer Component Architecture, Components of a Multi-DBMS	
5.	**Distributed Database Design.** Design Problem, Dimensions of the Problem, Distribution Design, Top-Down Design, Distribution Design Issues, Fragmentation, Fragmentation Alternatives – Horizontal, Fragmentation Alternatives – Vertical Degree of Fragmentation, Correctness of Fragmentation, Allocation Alternatives, Allocation Model	08
6.	**Semantic Data Control.** View management, Views in centralized DBMSs, update through views, Views in DDBMS, Data Security, centralized Authorization Control, Distributed Authorization Control, Semantic Integrity Control, Centralized and Distributed Semantic Integrity Control	08
7.	**Overview of Query Processing.** Query Processing, Query Processing Components , Selecting Alternatives, What is the Problem?, Cost of Alternatives, Query Optimization Objectives, Complexity of Relational Operations, Query Optimization Issues , Types of Optimizers, Query Optimization Issues Optimization Granularity, Query Optimization Issues Ò Optimization Timing, Query Optimization Issues ,Statistics, Query Optimization Issues, Query Optimization Issues Network Topology, Distributed Query Processing Methodology, Step Query Decomposition, Normalization, Analysis, Analysis Example, Analysis Simplification Example, Restructuring, Transformation Rules, Example : Equivalent Query, Provides Parallelism, Query Decomposition and Data Localization. , Optimization of Distributed Queries. , Introduction to Transaction Management. , Distributed Concurrency Control. , Distributed DBMS Reliability. , Parallel Database Systems. , Distributed Object Database Management Systems. , Database Interoperability	08

Text Books:

1. Principles of Distributed database systems, By M. tamer Ozsu, Petrick Valduriez, Pearson
2. Distributed Database Systems By Chhanda Ray, Pearson.

Reference Books:

1. Distributed Databases:Principles and Systems, Stefano Ceri, McGrawHill