MANGALORE UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE

CSH 453: ADVANCEDD DATABASE SYSTEMS		
Hours/Week: 4 **Credits : 4**		**I.A. Marks: 30** **Exams. Marks: 70**

Course Outcomes:

CO1: Explain the features of database management systems and Relational database.

CO2: Design conceptual models of a database using ER modeling for real life applications and also construct queries in Relational Algebra.

CO3: Create and populate a RDBMS for a real life application, with constraints and keys, using SQL.

CO4: Retrieve any type of information from a data base by formulating complex queries in SQL.

CO5: Analyze the existing design of a database schema and apply concepts of normalization to design an optimal database.

CO6: Build indexing mechanisms for efficient retrieval of information from a database.

	UNIT-I	**12 Hrs.**

OBJECT AND OBJECT RELATIONAL DATABASES: Concepts for Object Databases: Object Identity – Object structure – Type Constructors –Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies – Inheritance – Complex Objects – Object Database Standards, Languages and Design: ODMG Model – ODL –OQL – Object Relational and Extended – Relational Systems: Object Relational features in

SQL/Oracle – Case Studies.

	UNIT-II	**12 Hrs.**

PARALLEL AND DISTRIBUTED DATABASES : Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism – Design of Parallel Systems-Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Case Studies

	UNIT-III	12 Hrs.

INTELLIGENT DATABASES: Active Databases: Syntax and Semantics (Starburst, Oracle, DB2)- Taxonomy- Applications Design Principles for Active Rules- Temporal Databases: Overview of Temporal Databases-TSQL2- Deductive Databases: Logic of Query Languages – Datalog- Recursive Rules-Syntax and Semantics of Datalog Languages- Implementation of Rules and Recursion- Recursive Queries in SQL- Spatial Databases- Spatial Data Types- Spatial Relationships- Spatial Data Structures Spatial Access Methods-Spatial DB Implementation.

	UNIT-IV	12 Hrs.

ADVANCED DATA MODELS : Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management -Location Dependent Data Distribution - Mobile Transaction Models -Concurrency Control -Transaction Commit Protocols- Multimedia Databases- Information Retrieval- Data Warehousing-Data Mining- Text Mining.

EMERGING TECHNOLOGIES : XML Databases: XML-Related Technologies-XML Schema- XML Query Languages- Storing XML in Databases-XML and SQL- Native XML Databases- Web Databases- Geographic Information Systems- Biological Data Management-Cloud Based Databases: Data Storage Systems on the

Cloud- Cloud Storage Architectures-Cloud Data Models- Query Languages- Introduction to Big Data-Storage-Analysis.

REFERENCE BOOKS:
1. Elmasri and Navathe, **Fundamentals of Database Systems** 5th Edition, Addison-Wesley, 2007.
2. Raghu Ramakrishnan and Johannes Gehrke**, Database Management Systems**, 3rd Edition, McGraw-Hill, 2003.
3. **Data Base System Concepts,** Silberschatz, Korth and Sudharshan, 5th Edition, Mc-Graw Hill, 2006.
4. C.J. Date, A. Kannan, S. Swamynatham**, An Introduction to Database Systems**, 8th Edition, Pearson Education, 2006.