

Module No.	Unit No.	Topics	Hrs.
1.0		Introduction to Databases	02
	1.1	Introduction to databases, History of database system, Benefits of Database system over traditional file system, relational databases, Three tier database architecture, Data independence	
2.0		Data Models	03
	2.1	The importance of data models, Introduction to various data models (hierarchical, Network, Relational, Entity relationship and object model), Basic building blocks, Business rules, Degrees of data abstraction	
3.0		Database Design, ER-Diagram and Unified Modeling Language	08
	3.1	Database design and ER Model: overview, ER-Model and its Constraints, ER-Diagrams, ERD Issues, weak entity sets	
	3.2	Codd's rules, Relational Schemas, Introduction to UML Relational database model: Logical view of data, keys, integrity rules. Relational Database design: features of good relational database design, atomic domain	
4.0		Relational Algebra and Calculus	09
	4.1	Relational algebra: Introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics.	
	4.2	Operators, grouping and ungrouping, relational comparison. Calculus: Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities.	
	4.3	Normalization methods : 1NF, 2NF, 3NF, BCNF, 4NF, 5NF	
5.0		Constraints, Views and SQL	10
	5.1	What is constraints, types of constraints, Integrity constraints,	
	5.2	SQL: data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers.	
	5.3	Views: Introduction to views, data independence, security, updates on views, comparison between tables and views	
	5.4	** SQL Tools : MySQL, ORACLE 10G, POSTGRESQL	
6.0		Transaction management and Concurrency control	07
	6.1	Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management.	
	6.2	Database Security and privacy : Issues, Access Control based on grant and revoke privileges	
		Total	39

**** Teacher can select any one SQL Tool for implementation of SQL query**