

Database Management System

(Syllabus - Immersion Classes)

Week	Topic	Subtopic
1	Introduction to DBMS & Data Modeling Concepts	DBMS: Function, Importance, Advantages and Disadvantages of using DBMS, Types of DBMS (Hierarchical, Network, Relational, Object-Oriented), ER Models, EER Model
2	Relational Database Concepts	Relational Model, Keys & Constraints, Relational Algebra
3	SQL	Type of Language (DDL, DML, DCL), Basic SQL Commands (SELECT, INSERT, UPDATE, DELETE) Joins (INNER JOIN, OUTER JOIN, LEFT JOIN, RIGHT JOIN), Grouping (GROUP BY, HAVING clause), Aggregate Functions,
4	Advanced SQL & PL/SQL	Subqueries and Nested Queries, Views, Indexes, Procedure, Cursor & Triggers
5	Database Design/ Transaction Processing	Concept of keys, Functional Dependencies, Normalization (1NF, 2NF, 3NF, BCNF), Denormalization. ACID Properties (Atomicity, Consistency, Isolation, Durability), Serializability, Recoverability
6	NoSQL Databases (MongoDB)	Types of NoSQL databases (Document-based, Key-Value, Columnar, Graph), Characteristics and Use Cases
7	Case Studies	Database Connectivity through Python using MySQL/Sqlite3, Real-life examples of database implementations (Project work or case studies to demonstrate practical Applications)