



# Database Management System

SWAYAM Prabha Course Code-KCS 501

<b>PROFESSOR'S NAME</b>	Prof. Mamta Bhusry Prof. Vikram Bali Dr. Kakoli Banerjee
<b>DEPARTMENT</b>	Computer Science and Engineering
<b>INSTITUTE</b>	Ajay Kumar Garg Engineering College, Ghaziabad JSS Academy of Technical Education, Noida
<b>COURSE OUTLINE</b>	The course covers the complete study of database systems including the design, creation and querying of databases, the Structured Query Language, transaction processing, concurrent execution of transactions, recovery from failure and distributed databases.
<b>COURSE DETAILS</b>	

S. No	Module ID/ Lecture ID	Lecture Title/Topic
<b>UNIT - 1</b>		
1	Lecture 1	Introduction to Database Systems – Database, Database Management System, Database System, Metadata
2	Lecture 2	Introduction to Database Systems (contd...) – Database System versus traditional file system, characteristics of Database system, Database users
3	Lecture 3	Database System Concepts And Architecture – Data Abstraction, Database Models, Database Schema and Database State, Three Schema Architecture and Data Independence, Database Languages
4	Lecture 4	Database Modelling Using Entity Relationship (ER)Model – Entities, Attributes, domain of attribute
5	Lecture 5	Database Modelling Using Entity Relationship (ER)Model (contd...) – Relationship, degree of a relationship, recursive relationships, cardinality ratio
6	Lecture 6	Database Modelling Using Entity Relationship (ER)Model (contd...) – Participation constraints, weak entity type
7	Lecture 7	Database Modelling Using Entity Relationship (ER)Model (contd...) - Exercises
		Extended Entity Relationship (EER)
		Model – Generalization, Specialization, Aggregation

8	Lecture 8	Relational Model Concepts - Domain Constraints, Key Constraints, Constraints on NULL Values, Entity Integrity Constraint, Referential Integrity Constraint and Foreign Keys
9	Lecture 9	Mapping Of ERD And EERD To Relations
<b>UNIT - 2</b>		
10	Lecture 10	Relational data model Concepts, integrity constraints, entity integrity
11	Lecture 11	Referential integrity, Keys constraints, Domain constraints,
12	Lecture 12	Relational algebra
13	Lecture 13	Relational calculus, tuple and domain calculus.
14	Lecture 14	Introduction on SQL: Characteristics of SQL, advantage of SQL.
15	Lecture 15	SQL operators and their procedure. Tables, views and indexes
16	Lecture 16	Insert, update and delete operations, Joins, Unions
17	Lecture 17	Queries and sub queries. Aggregate functions
<b>UNIT-3</b>		
18	Lecture 18	Relational Database Design Using Normalization – Insertion, Deletion and Modification Anomalies, Functional Dependency, Closure of Set of Functional Dependencies, Trivial Functional Dependency, Inference Rules for Functional Dependencies, Closure of Functional Dependencies
19	Lecture 19	Relational Database Design Using Normalization – Usage of Attribute Set Closure to determine superkey, Canonical form of FDs, Equivalence of FDs
20	Lecture 20	Relational Database Design Using Normalization – First Normal Form, Second Normal Form
21	Lecture 21	Relational Database Design Using Normalization – Third Normal Form, Boyce Codd Normal form
22	Lecture 22	Properties of Relational Decomposition
23	Lecture 23	Higher Normal Forms – Fourth Normal Form, Fifth Normal Form
<b>UNIT-4</b>		
24	Lecture 24	Transaction system
25	Lecture 25	Testing of serializability, serializability of schedules
26	Lecture 26	Conflict & view serializable schedule, recoverability
27	Lecture 27	Recovery from transaction failures
28	Lecture 28	Log based recovery, checkpoints, deadlock handling
29	Lecture 29	Distributed Database: distributed data storage
30	Lecture 30	Concurrency control, directory system
31	Lecture 31	Concurrency Control

UNIT-5		
32	Lecture 32	Concurrency Control
33	Lecture 33	Locking Techniques for concurrency control
34	Lecture 34	Time stamping protocols for concurrency control
35	Lecture 35	Validation based protocol, multiple granularity
36	Lecture 36	Multi version schemes,
37	Lecture 37	Recovery with concurrent transaction,
38	Lecture 38	Case study of Oracle

References :

- Fundamentals of Database Systems (Fifth Edition), Elmasri Ramez, Navathe, Shamkant B, Pearson
- Database System Concept, Silberschatz Abraham, Korth Henry F, Sudarshan F, Mc Graw Hill