

SIDDAGANGA INSTITUTE OF TECHNOLOGY, TUMAKURU
LECTURE PLAN FOR THE ACADEMIC YEAR 2023 – 4

Teacher	Dr. Jagadamba G	Dept.	Information Science and Engineering
Class	5 th	Course	Data Base Management System (NSIS01)

Course Objectives

The objectives of this course are:

1. Learn basic concepts of database and database management systems.
2. Understand the fundamentals of relational system which includes data models, database architectures, database manipulations and ER diagram.
3. Get a comprehensive overview of Structured Query Language (SQL), construction of queries in SQL.
4. Learn the need of Normalization and the use of different types of Normalization.
5. Discuss concepts of Transaction management

Sl. No	Date	Topic	Remarks
UNIT – I			
1	16/11/23	Databases and Database Users Introduction, an example, characteristics of database approach.	
2	16/11/23	Actors on the screen, workers behind the scene. Advantages of using DBMS approach.	
3	17/11/23	A brief history of database applications, When not to use a DBMS.	
4	21/11/23	Database System – Concepts and Architecture Data models, schemas and instances.	
5	28/11/23	Three-schema architecture and data independence.	
6	01/12/23	Database languages and interfaces. The database system environment	
7	05/12/23	Centralized and Client-Server architectures.	
8	07/12/23	Classification of database management systems.	
UNIT – II			
9	08/12/23	Entity-Relationship Model Using high-level conceptual data models for database design.	
10	12/12/23	Examples of database applications.	
11	14/12/23	Entity types, entity sets	
12	15/12/23	Attributes and keys	
13	21/12/23	Relationship types, relationship sets, roles and structural constraints.	
14	22/12/23	Weak entity types and refining the ER design for the company database.	
15	26/12/23	ER diagrams, naming conventions and design issues	Assignment 1
UNIT – III			
16	28/12/23	SQL-The Relational Database Standard SQL data definition and data types, schema and catalog concepts in SQL.	
17	29/12/23	The create table command in SQL, attribute data types and domains in SQL. Specifying attribute constraints and attribute defaults, specifying key and referential integrity constraints.	

18	02/01/24	Specifying basic constraints in SQL: giving names to constraints, specifying constraints on tuples using check. Schema change statements in SQL: the drop command, the alter command.	
19	02/01/24	Basic queries in SQL: the select-from-where structure of basic SQL queries, ambiguous attribute names, aliasing, and tuple variables, unspecified where clause and use of the asterisk, tables as sets in SQL, substring pattern matching and arithmetic operators, ordering of query results.	
20	02/01/24	More complex SQL queries: comparisons involving null and three-valued logic. Nested queries, tuples, and set/multi-set comparisons; correlated nested queries, the exists and unique functions in SQL.	
21	02/01/24	Explicit sets and renaming of attributes in SQL. Joined tables in SQL, aggregate functions in SQL	
22	04/01/24	Grouping: the group by and having clauses, discussion and summary of SQL queries.	
23	05/01/24	Insert, delete statements in SQL, delete and update statements in SQL, additional features of SQL. Specifying general constraints as assertion and views (virtual tables) in SQL.	

UNIT – IV

24	11/01/24	Database Design Informal design guidelines for relation schemas semantics of the attributes, reducing the redundant information in tuples.	
25	12/01/24	Informal design guidelines for relation schemas reducing the null values in tuples.	
26	16/01/24	Disallowing the possibility of generating spurious tuples.	
27	18/01/24	Definition of functional dependencies, inference rules for functional dependencies.	
28	19/01/24	Functional dependencies equivalence of sets of functional dependencies, minimal sets of functional dependencies.	Assignment 2
29	23/01/24	Functional dependencies equivalence of sets of functional dependencies, minimal sets of functional dependencies.	
30	25/01/24	Normal forms based on primary keys, normalization of relations, practical use of normal forms.	
31	30/01/24	General definitions of first and second normal forms, with examples.	
32	01/02/24	General definitions of third normal form with examples. Boyce-Codd normal form with examples.	

UNIT – V

33	02/02/24	Transaction Processing Concepts Introduction to transaction processing single-user versus multi-user transactions - read and write operations and DBMS buffers.	
34	06/02/24	Introduction to transaction processing single-user versus multi-user transactions - read and write operations and DBMS buffers.	
35	13/02/24	Need of concurrency control and recovery.	
36	14/02/24	Transaction and system concepts transaction states and additional operations	
37	15/02/24	Discussions on system log, commit point.	
38	16/02/24	Desirable properties of transactions – ACID properties	
39	17/02/24	Desirable properties of transactions –characterizing schedules based on recoverability.	
40	17/02/24	Desirable properties of transactions –characterizing schedules based on recoverability.	

Text Books:

1. Elmasri and Navathe, Fundamentals of Database Systems, Sixth Edition, Mc- GrawHill, 2017.
2. Seema Acharya and Subhashini Chellappan, Big Data and Analytics, First Edition, Wiley India Private Limited, 2015.

Reference Books:

1. Silberschatz, Korth and Sudharshan, Data base System Concepts, Sixth Edition, Mc- GrawHill, 2010.
2. Raghu Ramakrishnan and Johannes Gehrke, Database Management Systems, Third Edition, McGraw-Hill, 2014.
3. Kyle Banker Peter Bakkum Shaun Verch Douglas Garrett Tim Hawkins, MongoDB Action, Second Edition, 2016.
4. Abraham Silberschatz, Henry F Korth, S Sudarshan, Database System Concepts, 7th Edition, McGraw Hill, 2019.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1: Describe database concepts, architecture, applications.

CO2: Analyze and Design of ER diagram based on application's data requirements.

CO3: Create SQL queries for given schema.

CO4: Apply normalization techniques to a given database.

CO5: Discuss transaction processing for a given database.

Mapping of Course Outcomes (COs) to Program Outcomes (POs) & Program Specific Outcomes (PSOs)

		POs												PSOs				
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
COs	CO1	2														2		
	CO2	2	2	2												2		
	CO3	2	2	2		2										2		
	CO4	2	2	2		2										2		
	CO5	2	2	2		2										2		

Assessment Tools		COs				
Direct AT		CO1	CO2	CO3	CO4	CO5
CIE (Individual)		✓	✓	✓	✓	✓
SEE (Individual)		✓	✓	✓	✓	✓
Assignments (Individual/Group)		✓	✓	✓	✓	✓
Micro Projects (Group)		--	--	--	✓	--
Topic seminar (Individual)		--	--	--	--	✓
Case studies (Individual/Group)		--	--	--	--	✓
Online courses (Individual)		--	--	--	--	--
Indirect AT						
Course end survey (Students)		✓	✓	✓	✓	✓
Student profile (Faculty)		--	--	--	--	--

Course delivery methods, assessment tools and sample questions:

CO1	Describe database, architecture and applications.
Delivery Methods	Chalk and talk/Power Point Presentation
Assessment Tools	CIE-Test 1 and 2, Assignment, SEE

Sample Questions	1. Define database. Explain the 3 tier architecture of database with a neat diagram. 2. Explain the importance of front end and back end users with examples.
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CO2	Analyze and Design of ER diagram based on application's data.
Delivery Methods	Chalk and talk
Assessment Tools	CIE-Test 1 and 2, Assignment, SEE
Sample Questions	1. Consider the following schema for a Library Database: BOOK (Book_id, Title, Publisher_Name, Pub_Year) BOOK_AUTHORS (Book_id, Author_Name) PUBLISHER (Publisher_Name, Address, Phone) BOOK_COPIES (Book_id, Branch_id, No-of-Copies) BOOK_LENDING (Book_id, Branch_id, Card_No, Date_Out, Due_Date) LIBRARY_BRANCH (Branch_id, Branch_Name, Address) Write SQL queries to a) Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch, etc. b) Get the particulars of borrowers who have borrowed more than 3 books from Jan 2018 to Jan 2019 c) Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.

CO3	Create SQL queries for given schema.
Delivery Methods	Chalk and talk/Power Point Presentation
Assessment Tools	CIE-Test 2, SEE
Sample Questions	1. Consider the schema for Movie Database: ACTOR (Act_id, Act_Name, Act_Gender) DIRECTOR (Dir_id, Dir_Name, Dir_Phone) MOVIES (Mov_id, Mov_Title, Mov_Year, Mov_Lang, Dir_id) MOVIE_CAST (Act_id, Mov_id, Role) RATING (Mov_id, Rev_Stars) Write SQL query to update rating of all movies directed by 'Karan Johar' to 4.

CO4	Apply normalization techniques to a given database.
Delivery Methods	Chalk and talk, Power Point Presentation
Assessment Tools	CIE-Test 2, Assignment, SEE
Sample Questions	1. Explain BCNF with an example 2. Compare and contrast 2NF and 3NF with an example.

CO5	Discuss transaction processing for the given database
Delivery Methods	Chalk and talk, Power Point Presentation
Assessment Tools	CIE- CIE-Test 2, Assignment, SEE
Sample Questions	1. Define the ACID properties with an example. 2. How does the absence of concurrency control and recovery hampers the shaping the database?

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Faculty

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HOD 08/11/2023

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Principal

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