

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
KURUKSHETRA UNIVERSITY, KURUKSHETRA**

Session: 2023-24			
Part A – Introduction			
Subject	COMPUTER SCIENCE		
Semester	IV		
Name of the Course	Data Management with DBMS		
Course Code	B23-CSE-401		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/ VAC)	CC		
Level of the course (As per Annexure-I)	200-299		
Pre-requisite for the course (if any)			
Course Learning Outcomes(CLO):	After completing this course, the learner will be able to: 1. learn basic concepts of database along with its functions and components 2. understand data models. 3. understand SQL as a query language and Learn the concept of relational algebra and calculus. 4. acquire knowledge of advanced concepts of DBMS. 5*. implement the queries based on database management.		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3	2	5
Max. Marks:100(70(T)+30(P)) Internal Assessment Marks:30(20(T)+10(P)) End Term Exam Marks: 70(50(T)+20(P))		Time: 3 Hrs.(T), 3Hrs.(P)	
Part B- Contents of the Course			
<u>Instructions for Paper-Setter</u> The examiner will set a total of nine questions. Out of which, the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate will have to attempt five questions in all, selecting one question from each unit. The first question will be compulsory.			

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

Unit	Topics	Contact Hours
I	Basic Concepts: Data, Information, Records, Files, Schema and Instance etc. Limitations of File-Based Approach, Characteristics of Database Approach, Database Management System (DBMS), DBMS Functions and Components, Database Interfaces, Advantages and Disadvantages of DBMS. Database Users: Data and Database Administrator, Role and Responsibilities of Database Administrator, Database Designers, Application Developers etc. Database System Architecture: 1-Tier, 2-Tier & Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances, Data Independence – Logical and Physical Data Independence	11
II	Data Models: Hierarchical, Network, and Relational Data Models. Entity-Relationship Model: Entity, Entity Sets, Entity Type, Attributes: Type of Attributes, Keys, Integrity Constraints, Designing of ER Diagram, Symbolic Notations for Designing, ER Diagram	11
III	SQL: Meaning, Purpose, and Need of SQL, Data Types, SQL Components: DDL, DML, DCL and DQL, Basic Queries, Join Operations and Sub-queries, Views, Specifying Indexes. Constraints and its Implementation in SQL. Relational Algebra: Basic Operations: Select, Project, Join, Union, Intersection, Difference, and Cartesian Product, etc. Relational Calculus: Tuple Relational and Domain Relational Calculus. Relational Algebra Vs. Relational Calculus.	12
IV	Relational Model: Functional Dependency, Characteristics, Inference Rules for Functional Dependency, Types of Functional Dependency, Normalization: Benefits and Need of Normalization, Normal Forms Based on Primary Keys- (1NF, 2NF, 3NF, BCNF), Multi-valued Dependencies, 4 NF, Join dependencies, 5 NF, Domain Key Normal Form.	11
V*	Practicum: Students are advised to do laboratory/practical practice not limited to but including the following types of problems: • Write a SQL query for creating and describing a table of the salesman in a company. • Write a query to insert data into a table. • Write a SQL statement to display all the information of all salesmen. • Write a query that will retrieve the value of the salesman if of all salesman, getting orders from the customers in the orders table without any repeats.	30

	• Write a SQL statement to display the name and city of the salesman, who belongs to the city of Paris. • Write a SQL statement to display all the information for those customers with a grade of 200. • Write a SQL statement to delete a particular record from a table • Write an SQL statement that selects the highest grade for each of the cities of customers using the GROUP BY clause. • Write an SQL statement that selects the particular record using the ORDER BY clause. • Write a SQL statement to prepare a list with the salesman's name, the customer's name, and their cities for the salesman and customer who belong to the same city, • Write a SQL statement to know which salesman is working for which customers. • Write an SQL statement to create a view of the table. • Write an SQL statement to rename, update, and delete a view. • Write an SQL statement to update the record in a table. • Write a SQL statement to drop and truncate a table. • Understanding relational model concepts • Converting a table into various normal forms. • Understanding various concepts of databases	
Suggested Evaluation Methods		
Internal Assessment: ➤ Theory • Class Participation: 5 • Seminar/presentation/assignment/quiz/class test etc.: 5 • Mid-Term Exam: 10 ➤ Practicum • Class Participation: NA • Seminar/Demonstration/Viva-voce/Lab records etc.: 10 • Mid-Term Exam: NA		End-Term Examination: A three-hour exam for both theory and practicum. End Term Exam Marks: 70(50(T)+20(P))
Part C-Learning Resources		
Recommended Books/e-resources/LMS: • Elmasri & Navathe: Fundamentals of Database Systems, Pearson Education. • Thomas Connolly Carolyn Begg: Database Systems, Pearson Education. • Korth & Silberschatz: Database System Concept, McGraw Hill International Edition. • Raghu Ramakrishnan & Johannes Gehrke: Database Management Systems, McGraw Hill. • Ivan Bayross: SQL, PL/SQL- The Program Language of ORACLE, BPB Publication.		

*Applicable for courses having practical components.