

# Govt. Polytechnic Hamirpur (H.P.)

## Lecture Planning (Theory)

Branch : Information Technology Semester : 4th \_\_\_\_\_

Subject : Relational Database Management System Session: Jan-June 2026

Teacher: Vijay Pathania Laboratory : Programming Lab

Sr. No.	No. of Lectures Planned	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1.	8	Introduction to Database Systems	Database Systems, Database and its Purpose, Comparison of Database Approach with File-based and Traditional Record Keeping Approaches, Advantages and Disadvantages of Database Approach, Classification of Database Users, Role of DBA.	R1,R2,R3, R4	
2.	12	Database System Concepts and Architecture	Data Models, Schemas, and Instances; ANSI/SPARC Architecture of a Database System, External Level, Conceptual Level, Internal Level, Mappings; Data Independence, Logical Data Independence, Physical Data Independence	R1,R2,R3, R4,R5	
3.	10	Relational and E-R Models	Relational Database Model, Relations, Attributes, Tuples, Domains; Prime and Non-prime Attributes, Key – Primary Key, Candidate Keys, Alternate Keys, Superkey, Secondary Key, Foreign Keys; Database Constraints, Entity Relationship Model - Entity, Entity Sets, Strong and Weak Entities, Attributes, and Keys; Association, Relationship, Roles, Structural Constraints, ER Diagrams	R1,R2,R4, R5	
4.	10	Database Dependencies and Normalization	Functional Dependencies, Trivial and Non-trivial Dependencies, Non-Loss Decomposition, Normalization, First, Second and Third Normal Forms, Boyce-Codd Normal Form	R1,R2,R3	
5.	12	Overview of MySQL	MySQL, Features of MySQL, Database Objects - Database, Table, View, Index, Alias; MySQL Object Naming, Keywords, User-defined Variables, Data Types - Numeric, Date and Time, String Types; Operators: Arithmetic, Logical, Relational, String; MySQL System Schema, MySQL Database Users and Roles, Database Privileges, Access Control and Account Management, MySQL Server and MySQL Client	R1,R2,R5,R 6	
6	12	Structure Query Language using MySQL	SQL, DDL Statements : CREATE, DROP, ALTER, RENAME; DML Statements: INSERT, UPDATE , DELETE, SELECT; SELECT Clauses - FROM, WHERE, ORDER BY, GROUP BY, HAVING; Join Operations - Inner, Left, Right and Outer Joins; Subqueries, Set Operations - Union, Intersect, Minus; GRANT and REVOKE Privileges; Transaction Statements - COMMIT, ROLLBACK, SAVEPOINT; Prepared Statements, SQL Functions - ABS, ROUND, FLOOR, CEIL, SQRT, POWER, TRUNCATE, LOG, NOW, DATE,	R1,R2,R3, R4,R5,R6	

			TIME, CURDATE, CURTIME, DAY, MONTH, YEAR, DATEDIFF, DATE_SUB, DATE_ADD, DATE_FORMAT, CONCAT, LENGTH, UPPER, LOWER, LEFT, RIGHT, LTRIM, RTRIM, MAX, MIN, SUM, AVG, COUNT, CAST, STR_TO_DATE.		
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**Teaching Resources:**

- R1: An Introduction to database systems by Bipin C. Desai, Galgotia Publications  
 R2: Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan Tata McGraw Hill  
 R3: Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, Pearson Education  
 R4: MySQL 8 Cookbook by Karthik Appigatla, Packt Publishing  
 R5: An Introduction to Database Systems by C.J. Date, Addison Wesley  
 R6: MySQL: The Complete Reference by Vikram Vaswani, Tata McGraw Hill

**Course Outcomes :**

- CO-1. Understand the basic terminology associated with database management.  
 CO-2. Design an optimal database for a given basic application.  
 CO-3. Apply normalisation techniques while designing databases.  
 CO-4. Use SQL commands to carry out various database operations

*Vaswani*  
2/02/2016

Signature of Teacher with Date

*Desai*

Signature of H.O.D.

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## Practical Planning & Coverage

Branch : Information Technology

Semester : 4th

Subject : Database Management System Session: Jan- June 2026

Teacher: Vijay Pathania (41)

Laboratory: Programming Lab

Pract No.	Description of Practical	Reference for Procedure/ Writeup	Likely Dates	Actual Dates	Signature
1.	To install and configure MySQL database server on Windows or Linux machines.	Lab Manual	28/01/2026		
2.	To create database tables having columns with different data types, widths and precisions.	Lab Manual	04/02/2026		
3.	To alter existing database tables to add new columns, delete existing columns and change column names, data types and widths.	Lab Manual	11/02/2026		
4.	To apply integrity constraints - PRIMARY KEY, NOT NULL, UNIQUE, CHECK, FOREIGN KEY, to the database tables.	Lab Manual	18/02/2026		
5.	To insert data of different data types in tables (INSERT statement).	Lab Manual	20/02/2026		
6.	To view the data stored in different tables using the SELECT statement. Apply WHERE, HAVING, ORDER BY and GROUP BY clauses with SELECT.	Lab Manual	06/03/2026		
7.	To demonstrate join operation on tables using left, right and inner join.	Lab Manual	11/03/2026		
8.	To demonstrate at least 10 SQL row functions in queries.	Lab Manual	13/03/2026		
9.	To demonstrate SUM, MAX, MIN, COUNT aggregate functions and also demonstrate the use of HAVING and GROUP BY clauses in SELECT statements.	Lab Manual	25/03/2026		
10.	Case Study : Student Database - The case study project must identify various entities related to the students in a typical academic	Lab Manual	08/04/2026		

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## Practical Planning & Coverage

Branch : Information Technology (G2) Semester : 4th

Subject : Database Management System Session: Jan- June 2026

Teacher: Vijay Pathania Laboratory: Programming Lab

Pract No.	Description of Practical	Reference for Procedure/ Writeup	Likely Dates	Actual Dates	Signature
1.	To install and configure MySQL database server on Windows or Linux machines.	Lab Manual	29/01/2026		
2.	To create database tables having columns with different data types, widths and precisions.	Lab Manual	03/02/2026		
3.	To alter existing database tables to add new columns, delete existing columns and change column names, data types and widths.	Lab Manual	05/02/2026		
4.	To apply integrity constraints - PRIMARY KEY, NOT NULL, UNIQUE, CHECK, FOREIGN KEY, to the database tables	Lab Manual	10/02/2026		
5.	To insert data of different data types in tables (INSERT statement).	Lab Manual	17/02/2026		
6.	To view the data stored in different tables using the SELECT statement. Apply WHERE, HAVING, ORDER BY and GROUP BY clauses with SELECT	Lab Manual	24/02/2026		
7.	To demonstrate join operation on tables using left, right and inner join	Lab Manual	26/02/2026		
8.	To demonstrate at least 10 SQL row functions in queries.	Lab Manual	10/03/2026		
9.	To demonstrate SUM, MAX, MIN, COUNT aggregate functions and also demonstrate the use of HAVING and GROUP BY clauses in SELECT statement.	Lab Manual	17/03/2026		
10	Case Study : Student Database – The case study project must identify various entities related to the students in a typical academic	Lab Manual	29/03/2026		

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	institution, draw E-R diagrams, Apply Database Normalization, Create Tables, Apply Database Constraints, Insert data, Delete Data and Query the Database etc				
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*Pethani*

*Pankaj*

Signature of H.O.D.