Course Code	**18CIPC508**					
Category	Engineering Science Courses : Professional Core					
Course title	**DATABASE MANAGEMENT SYSTEMS – LABORATORY**					
Scheme and Credits	No. of Hours/Week					Semester - V CSE/ISE
	L	T	P	SS	Credits	
	0	0	3	0	1.5	
CIE Marks: 50	SEE Marks: 50		Total Max. Marks: 100			Duration of SEE: 03 Hours
Prerequisites (if any): NIL						

COURSE OBJECTIVES:

The course will enable the students to

1. Apply the specification of Structured Query Language (SQL) for database creation and manipulation.
2. Design the ER Diagram and apply ER-mapping rules.
3. Apply the working of different concepts of DBMS.
4. Implement and test the database developed for applications.
5. Demonstrate GUI for database usage.

PART-A: SQL PROGRAMMING:

- Design, develop, and implement the specified queries for the following problems using Oracle, MySQL, MS SQL Server, or any other DBMS under LINUX/Windows environment.
- Create Schema and insert at least 5 records for each table. Add appropriate database constraints.

PART-B: MINI PROJECT:

- Use Java, PHP, Python, or any other similar front-end tool.
- All applications must be demonstrated on desktop/laptop as a stand-alone or web based application (Mobile apps on Android/IOS are not permitted).

PART-A: SQL PROGRAMMING

1. Library Database:

Consider the following schema for a Library Database:

BOOK(Book_id, Title, Publisher_Name, Pub_Year)

BOOK_AUTHORS(Book_id, Author_Name)

PUBLISHER(Pub_id, 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:

1. Retrieve details of all books in the library: id, title, name of publisher, authors, number of copies in each branch, etc.

2. Get the particulars of borrowers who have borrowed more than 3 books from Jan 2019 to Jun 2019.

3. Delete a book in BOOK table and Update the contents of other tables to reflect this data manipulation operation.

4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.

5. Create a view of all books and its number of copies that are currently available in the Library.

2. Sales_Order Database

Consider the following schema for Sales_Order Database:

SALESMAN(Salesman_id, Name, City, Commission)

CUSTOMER(Customer_id, Cust_Name, City, Grade, Salesman_id)

ORDERS(Ord_No, Purchase_Amt, Ord_Date, Customer_id, Salesman_id)

Write SQL queries to:

1. Count the customers with grades above Bangalore's average.

2. Find the name and numbers of all salesman who had more than one customer.

3. List all the salesman and indicate those who have and don't have customers in their cities (Use UNION operation.)

4. Create a view that finds the salesman who has the customer with the highest order of a day.

5. Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted

3. Movie Database:

Consider the following 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 queries to:

1. List the titles of all movies directed by 'ABCD'.

2. Find the movie names where one or more actors acted in two or more movies.
3. List all actors who acted in a movie before 2000 and also in a movie after 2015 (use JOIN operation).
4. Find the title of movies and number of stars for each movie that has at least one rating and find the highest number of stars that movie received. Sort the result by movie title.
5. Update rating of all movies directed by 'XYZ' to 5.

4. College Database

Consider the schema for College Database:
STUDENT(USN, SName, Address, Phone, Gender)
SEMSEC(SSID, Sem, Sec)
CLASS(USN, SSID)
SUBJECT(Subcode, Title, Sem, Credits)
IA-MARKS(USN, Subcode, SSID, Test1, Test2, Test3, FinalIA)

Write SQL queries to:
1. List all the student details studying in fourth semester 'C' section.
2. Compute the total number of male and female students in each semester and in each section.
3. Create a view of Test1 Marks of student USN '11XX1234' in all subjects.
4. Calculate the FinalIA (average of best two test Marks) and update the corresponding table for all students.
5. Categorize students based on the following criterion:
   If FinalIA = 17 to 20 then CAT = 'Outstanding'
   If FinalIA = 12 to 16 then CAT = 'Average'
   If FinalIA< 12 then CAT = 'Weak'
   Give these details only for 8th semester A, B, and C section students.

5. Company Database

Consider the schema for Company Database:
EMPLOYEE(SSN, Name, Address, Sex, Salary, SuperSSN, DNo)
DEPARTMENT(DNo, DName, MgrSSN, MgrStartDate)
DLOCATION(DNo,DLoc)
PROJECT(PNo, PName, PLocation, DNo)
WORKS_ON(SSN, PNo, Hours)

Write SQL queries to:
1. Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.

2. Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise.

3. Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department

4. Retrieve the name of each employee who works on all the projects controlled by department number 5 (use NOT EXISTS operator).

5. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs.6,00,000.

PART B: MINI PROJECT

- For any problem selected, write the ER Diagram, apply ER-mapping rules, normalize the relations, and follow the application development process.

- Make sure that the application should have five or more tables, at least one trigger and one stored procedure, using suitable frontend tool.

- Indicative areas include; health care, education, industry, transport, supply chain, etc.

COURSE OUTCOMES:

The students at the end of the course, will be able to

CO1: Use Structured Query Language (SQL) for database creation and manipulation.

CO2: Design the ER Diagram and apply ER-mapping rules.

CO3: Demonstrate the working of different concepts of DBMS.

CO4: Implement and test the database developed for applications.

CO5: Demonstrate GUI for database usage.

SCHEME OF EXAMINATION:

Continuous Internal Evaluation (CIE) Laboratory - (50 Marks)	Marks	Semester End Evaluation (SEE) Laboratory - (100 Marks)	Marks
Performance of the student in the laboratory, every week	20	Write up	20
Test at the end of the semester (Part A + Part B)	20	Execution of any one program from Part A and demonstration of mini project from Part B	60
Viva voce	10	Viva voce	20
Total	**50**	**Total**	**100**

Note: SEE shall be conducted for 100 Marks and the Marks obtained is scaled down to 50 Marks.

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