DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
(AUTONOMOUS)
(Approved by AICTE & Affiliated to Anna University, Chennai)
Accredited with 'A' Grade by NAAC, Accredited by TCS
Accredited by NBA with BME, ECE & EEE
PERAMBALUR - 621 212. Tamil Nadu.
website : www.dsengg.ac.in

LABORATORY COURSE PLAN

COURSE – INFORMATION:

LAB COURSE TITLE	DATABASE MANAGEMENT SYSTEMS LABORATORY			
LAB COURSE CODE	U23ITP33			
LAB COURSE STRUCTURE	**LECTURE**	**TUTORIAL**	**PRACTICAL**	**CREDIT**
	0	0	4	2
REGULATION	**BRANCH**	**YEAR**	**SEMESTER**	**ACADEMIC YEAR**
2023	IT	II	III	2024-2025
COURSE INCHARGE				

SYLLABUS

COURSE OBJECTIVE:

- To learn and implement important commands in SQL
- To learn the usage of nested and joint queries
- To understand functions, procedures and procedural extensions of databases
- To understand design and implementation of typical database applications.
- To be familiar with the use of a front end tool for GUI based application development.

LIST OF EXPERIMENTS

1. Create a database table, add constraints (primary key, unique, check, Not null), insert rows, update and delete rows using SQL DDL and DML commands.
2. Create a set of tables, add foreign key constraints and incorporate referential integrity.
3. Query the database tables using different „where" clause conditions and also implement aggregate functions.
4. Query the database tables and explore sub queries and simple join operations.
5. Query the database tables and explore natural, equi and outer joins.
6. Write user defined functions and stored procedures in SQL.
7. Execute complex transactions and realize DCL and TCL commands.
8. Write SQL Triggers for insert, delete, and update operations in a database table.

9. Create View and index for database tables with a large number of records.
10. Create an XML database and validate it using XML schema.
11. Create Document, column and graph based data using NOSQL database tools.
12. Develop a simple GUI based database application and incorporate all the above-mentioned features
13. Case Study using any of the real life database applications from the following list
    a) Inventory Management for a EMart Grocery Shop
    b) Society Financial Management
    c) Cop Friendly App – Eseva
    d) Property Management – eMall
    e) Star Small and Medium Banking and Finance
    - Build Entity Model diagram. The diagram should align with the business and functional goals stated in the application.
    - Apply Normalization rules in designing the tables in scope.
    - Prepared applicable views, triggers (for auditing purposes), functions for enabling enterprise grade features.
    - Build PL SQL / Stored Procedures for Complex Functionalities, ex EOD Batch Processing for calculating the EMI for Gold Loan for each eligible Customer.
    - Ability to showcase ACID Properties with sample queries with appropriate settings

TEXT/REFERENCE BOOKS:

- ❖ Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Seventh Edition, McGraw Hill, 2020
- ❖ Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", Seventh Edition, Pearson Education, 2017
- ❖ C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006

VIRTUAL LAB LINK:

http://vlabs.iitkgp.ernet.in/se/4/theory/
http://vlabs.iitb.ac.in/vlabs-dev/labs/dblab/labs/index.php
https://www.balajia.co.in/SBJ/dbmscs8481

EXP. NO.	NAME OF THE EXPERIMENTS	NO. OF PERIODS	CUMULATIVE PERIODS
	CYCLE I		
1	Create a database table, add constraints (primary key, unique, check, Not null), insert rows, update and delete rows using SQL DDL and DML commands.	4	4
2	Create a set of tables, add foreign key constraints and incorporate referential integrity.	4	8
3	Query the database tables using different „where" clause	4	12

	conditions and also implement aggregate functions		
4	Query the database tables and explore sub queries and simple join operations	4	16
5	Query the database tables and explore natural, equi and outer joins	4	20
6	Write user defined functions and stored procedures in SQL.	4	24
7	Execute complex transactions and realize DCL and TCL commands	4	28
CYCLE II			
8	Write SQL Triggers for insert, delete, and update operations in a database table	4	32
9	Create View and index for database tables with a large number of records.	4	36
10	Create an XML database and validate it using XML schema.	4	40
11	Create Document, column and graph based data using NOSQL database tools	4	44
12	Develop a simple GUI based database application and incorporate all the above-mentioned features	4	48
13	Case Study using any of the real life database applications from the following list a) Inventory Management for a EMart Grocery Shop b) Society Financial Management c) Cop Friendly App – Eseva d) Property Management – eMall e) Star Small and Medium Banking and Finance	12	60

COURSE OUTCOME

At the end of the course, the student should be able to:

CO 1: **Utilize** typical data definitions and manipulation commands
CO 2: **Develop** applications to test Nested and Join Queries
CO 3: **Build** simple applications using Views
CO 4: **Build** Procedures and Functions
CO 5: **Develop** and manipulate data using NOSQL database
CO 6: **Develop** applications that require a Front-end Tool

CO-PO MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	3	2	1	1	-	-	-	-	1	-	-	-	2	-
CO2	3	2	1	1	-	-	-	-	1	-	-	-	2	-
CO 3	3	2	1	1	-	-	-	-	1	-	-	-	2	-
CO 3	3	2	1	1	-	-	-	-	1	-	-	-	2	-
CO 4	3	2	1	1	-	-	-	-	1	-	-	-	2	-
CO 5	3	2	1	1	-	-	-	-	1	-	-	-	2	-
CO 6	3	2	1	1	-	-	-	-	1	-	-	-	2	-
AVG:	**3.00**	**2.00**	**1.00**	**1.00**	**-**	**-**	**-**	**-**	**1.00**	**-**	**-**	**-**	**2.00**	**-**

ADDITIONAL EXPERIMENTS		
EXP. NO.	**NAME OF THE EXPERIMENTS**	**IDENTIFIED RESOURCE LINK**
1	PL/SQL procedure to display Fibonacci Series	https://www.geeksforgeeks.org/program-fibonacci-numbers-plsql/
2	PL/SQL procedure to display Students information using Array	https://www.geeksforgeeks.org/plsql-arrays/
3	PL/SQL procedure to display biggest of three number	https://www.geeksforgeeks.org/greatest-number-among-three-given-numbers-in-pl-sql/
4	PL/SQL procedure to display palindrome	https://www.geeksforgeeks.org/check-number-palindrome-plsql/
5	PL/SQL procedure to display palindrome	https://www.geeksforgeeks.org/check-armstrong-number-plsql/

MODEL LAB DETAILS

BATCH	REGISTER NO.	MODE OF LAB CONDUCT	DATE	TIMING

LIST OF QUESTIONS

1. Consider the Insurance database given below.
   PERSON(driver_ID, name, address)
   CAR(regno, model,year)
   ACCIDENT(report_number,accd_date,location)
   OWNS(driver_id,regno)
   PARTICIPATED(driver_id,regno,report_number,damage_amount)
   i. Specify the primary keys and foreign keys and enterat least five tuples for each relation.
   ii. Update the damage amount for the car with specific regno in the accident with reportnumber 1025.
   iii. Add a new accident to the database.
   iv. Find the total number of people who owned cars that were involved in accidents in theyear 2018.
   v. Find the number of accidents in which cars belonging Wagon R were involved.
2. Create the Book database and do the following:
   book(book_name,author_name,price,quantity).
   i. Write a query to update the quantity by double in the table book.
   ii. List all the book_name whose price is greater than those of book named "Database for Dummies".
   iii. Retrieve the list of author_name whose first letter is 'a' along with the book_name and price.
   iv. Write a PL/SQL Procedure to find the total number of books of same author.
3. Create the Company database with the following tables and do the following:
   Administration(employee_salary, development _cost, fund_amount, turn_over,bonus)
   Emp_details (emp_no, emp_name, DOB, address, doj, mobile_no, dept_no, salary).
   i. Calculate the total and average salary amount of the employees of each department.
   ii. Display total salary spent for employees.
   iii. Develop a PL/SQL function to display total fundamount spent by the administration department .
4. Create the student database with the following tables and do the following:
   assessment(reg_no,name, mark1, mark2, mark3, total)
   dept_details (dept_no, dept_name, location).
   i. Using alter command drop the column location from the table dept_details.
   ii. Display all dept_name along withdept_no.
   iii. Drop the table dept_details.
   iv. Write a PL/SQL Trigger to verify the data before insertion on assessment table.
5. Consider the following Tables for a bus reservation system application:
   BUS (ROUTENO, SOURCE, DESTINATION)
   PASSENGER (PID, PNAME, DOB, GENDER)
   BOOK_TICKET (PID, ROUTENO, JOURNEY_DATE, SEAT_NO)
   i. Include constraint that DOB of passenger should be after 2000
   ii. Display the passengers who had booked the journey from Mumbai to Chennai on 02-Feb-2019

iii. List the details of passengers who have traveled more than three times on the same route.
iv. Create a View that displays the RouteNo, source, destination and journey_date whichmoves from Chennai to Delhi.
v. In the above created procedure, include exceptions to display "No ticket booked on specified date" for a given journey_date.

6. Consider the following tables.
SAILOR(sid, sname, rating, age)
BOATS(bid, bname, colour)
RESERVES(sid, bid, day)
List the sailors in the descending order of their rating.
i. List the sailors whose youngest sailor for each rating and who can vote.
ii. List the sailors who have reserved for both 'RED' and 'GREEN' boats.
iii. Create synonym for sailor table.
iv. Create a PL / SQL Function that accepts SID and returns the name of sailor.

7. Consider the following relations for an order processing application:
CUSTOMER (CID, NAME)
PRODUCT (PCODE, PNAME, UNIT_PRICE)
CUST_ORDER (OCODE, ODATE, CID)
ORDER_PRODUCT (OCODE, PCODE, QTY)
i. Develop a Trigger to ensure the product to be Pen , Eraser, Pencil during insertion
ii. Develop a PL/SQL Function to calculate the total cost of ordered product.
iii. Use Sequence for PCODE insertion in product table

8. Consider the following relations for a transport management system application:
DRIVER (DCODE, DNAME, DOB, GENDER)
CITY (CCODE, CNAME)
TRUCK (TRUCKCODE, TTYPE)
i. Include the constraint as mentioned above and the gender of driver is always 'male'.
ii. Develop a SQL query to list the details of each driver and the number of trips traveled.
iii. Create an index on truck_code in Drive_truck table .
iv. Use Cursor to display the details of all drivers, and the truck_code

9. Consider the following relational schema for a banking database application:
CUSTOMER (CID, CNAME)
BRANCH (BCODE, BNAME)
ACCOUNT (ANO, ATYPE, BALANCE, CID, BCODE)
TRANSACTION (TID, ANO, TTYPE, TDATE, TAMOUNT)
i. Develop a SQL query to list the details of branches and the number of accounts in each branch.
ii. Develop a SQL query to list the details of customers who have performed the most transactions today
iii. Create a view that will keep track of the details of each customer and account details who have both savings and current account.
iv. Develop a database trigger that will update the value of BALANCE in ACCOUNT table when a record is inserted in the transaction table

10. Consider the following database of student enrollment in courses and books adopted forthat

course.
STUDENT(regno, name, major, bdate)
COURSE(courseno, cname, dept)
ENROLL(regno, courseno, sem, marks)

i. Display the total number of students register for more than two courses in a department specified.
ii. Display the students who have secured the highest mark in each course
iii. List the youngest student of each course in all departments.
iv. Develop PL/SQL Cursor that selects marks of a particular student in a specified semester.

11. The following are maintained by a book dealer.
AUTHOR(author_id, name, city, country)
PUBLISHER(publisher_id, name, city, country)
CATALOG(book_id, title, author_id, publisher_id , category_id, year, price)
CATEGORY(category_id, description)
ORDER_DETAILS(order_no, book_id, quantity)

i. List the author of the book that has minimum sales.
ii. Display total number of books in each category.
iii. Develop a PL/SQL procedure that updates the price of the book by 10% those with maximum sales.

12. Create the student database with the following tables and do the following:
mark_details(reg_no,name, mark1, mark2, mark3, total)
dept_details (dept_no, dept_name, HOD)
stud_details(reg_no,name, dob, address)

i. Using alter command to assign foreign key in mark_details.
ii. Display the address of the students who have secured the top three ranks.
iii. Write a PL/SQL procedure to update the grade according to the marks secured.

13. Create a database for IoT simulator with the following tables.
Device_details (deviceID, devicename, properties)
Connect_status(deviceID, loginTime, logoutTime)
Transaction_details(transID, deviceID, updatedProperties, timeofUpdation)

i. List the details of the devices that are connected in a particular session
ii. Display the details of the device and its property that has been active for most of the time.
iii. Develop a PL/SQL procedure that deletes the details of the devices that have been least updated.

14. Create a database for maintaining the cloud database
PAAS_details(server, platform, startDate, endDate, rate)
SAAS_details(server, software, startDate, endDate, rate)
DAAS_details(server, database, startDate, endDate, rate)
transaction(service, logintime, logouttime)

i. List the details of the services requested from 5th Feb to 10th Feb, 2019.
ii. Display the details of the service that are least used and most used.
iii. Develop a PL/SQL function that returns the total amount invested on platform service in the month of February.

16. Create a database for Placement and Training cell.
Stud_details(regno, name, dept, percentage)
Company(companyID,name, noOfVacancy)

Training_Details(CourseID, name, Trainer)
Placed(regno, companyID,minSal)

i. List the students who are eligible for recruitment in a particular company.
ii. Display the student who has been placed with highest salary
iii. Develop a PL/SQL exception that provides an alternate for not eligible students.

17. Create a database for Transportation management system in an organization. Identify appropriate tables and optimize them using normalization. Develop an application using front end designing with backend database connectivity.
18. Create a database for listing the academic performance of affliated colleges under Anna Univeristy. Identify the tables needed. Apply normalization on identified tables. Develop an application with suitable UI design and finally generate the academic performance.
19. Develop an application with front end design for Railway Ticket Reservation system using approriate database system.
20. Develop an application for students attendance tracking and reporting system with good UI design and database connectivity.

VIVA QUESTIONS

1. Who is a DBA?
2. What is a data model?
3. List the types of data model used.
4. What is data base management system?
5. List any eight applications of DBMS.
6. What are the disadvantages of file processing system
7. Give the levels of data abstraction
8. What are axioms?
9. Define Boyce codd normal form
10. What is 2NF?
11. What is the use of sub queries?
12. What is the use of group by clause?
13. List the table modification commands in SQL.
14. Mention the 2 forms of integrity constraints in ER model
15. What is assertion? Mention the forms available
16. What is the need for triggers?
17. List the types of authorization.
18. Mention the various user privileges.
19. What are the states of transaction?
20. What are the two types of serializability?
21. What is 1NF?
22. What are the types of keys?
23. What are the advantages of DBMS?
24. What do you mean by transparent DBMS?
25. What are the unary operations in Relational Algebra?
26. What do you mean by transparent DBMS?
27. How many types of database languages are?
28. What do you understand by Data Model?
29. Define a Relation Schema.

30. Define Relation.
31. What is a degree of Relation?
32. What is Relationship?
33. What are the disadvantages of file processing systems?
34. What is data abstraction in DBMS?
35. What are the three levels of data abstraction?
36. What is Relational Calculus?
37. What do you understand by query optimization?
38. What is Denormalization?
39. What is functional Dependency?
40. What is E-R Model?
41. What is an entity?
42. What is an entity type?
43. What is an entity set?
44. What is an weak entity set?
45. What is an attribute?
46. What are the integrity rules in DBMS?
47. What are the types of Data Dependence?
48. What is Join?
49. Explain ACID properties.
50. What is the difference between a DELETE command and a TRUNCATE command.

Google Classroom Code : tyxfiz2

Google Classroom Name **: U23ITP33 DBMS LAB**

Prepared By **Verified By**

Approved By