DATABASE MANAGEMENT SYSTEMS LABORATORY MANUAL

(R2021123)

II/IV B.Tech, Semester-I

Academic Year: 2023-24
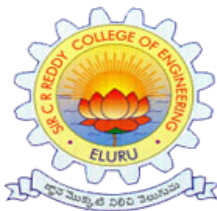

DEPARTMENT OF INFORMATION TECHNOLOGY

SIR C R REDDY COLLEGE OF ENGINEERING

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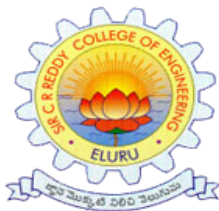Website: www.sircrrengg.ac.in
DEPARTMENT OF INFORMATION TECHNOLOGY

VISION OF THE DEPARTMENT

- ❖ To be a premier Department in the region in the field of Information Technology through academic excellence and research that enable graduates to meet the challenges of industry and society

MISSION OF THE DEPARTMENT

- ❖ To Provide dynamic teaching-learning environment to make the students industry ready and advancement in career;
- ❖ To inculcate professional and leadership quality for better employability and entrepreneurship;
- ❖ To make high quality professional with moral and ethical values suitable for industry and society

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PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using the first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, society, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in society and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multi-disciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.

PO12: Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
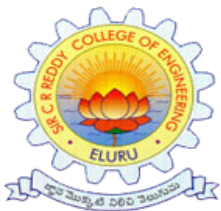
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PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Design and develop software in the area of relevance under realistic constraints.

PSO2: Adapt new and fast emerging technologies in the field of Information Technology.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Solve real world problems through effective professional skills in Information Technology industry and academic research.

PEO2: Analyze and develop applications in Information Technology domain and adapt to changing technology trends with continuous learning.

PEO3: Practice the profession in society with ethical and moral values.
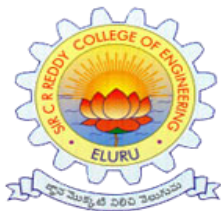
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GENERAL LABORATORY INSTRUCTIONS

1. Students are advised to come to the laboratory at least 5 minutes before (to the starting time), those who come after 5 minutes will not be allowed into the lab.

2. Plan your task properly much before to the commencement, come prepared to the lab with the synopsis / program / experiment details.

3. Student should enter into the laboratory with:

   a. Laboratory observation notes with all the details (Problem statement, Aim, Algorithm, Procedure, Program, Expected Output, etc.,) filled in for the lab session.

   b. Laboratory Record updated up to the last session experiments and other utensils (if any) needed in the lab.

   c. Proper Dress code and Identity card.

4. Sign in the laboratory login register, write the TIME-IN, and occupy the computer system allotted to you by the faculty.

5. Execute your task in the laboratory, and record the results / output in the lab observation note book, and get certified by the concerned faculty.

6. All the students should be polite and cooperative with the laboratory staff, must maintain the discipline and decency in the laboratory.

7. Computer labs are established with sophisticated and high end branded systems, which should be utilized properly.

8. Students / Faculty must keep their mobile phones in SWITCHED OFF mode during the lab sessions. Misuse of the equipment, misbehaviors with the staff and systems etc., will attract severe punishment.

9. Students must take the permission of the faculty in case of any urgency to go out ; if anybody found loitering outside the lab / class without permission during working hours will be treated seriously and punished appropriately.

10. Students should LOG OFF/ SHUT DOWN the computer system before he/she leaves the lab after completing the task (experiment) in all aspects. He/she must ensure the system / seat is kept properly.

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COURSE OBJECTIVES:

This Course will enable students to

➤ **Populate and query a database using SQL DDL/DML Commands**

➤ **Declare and enforce integrity constraints on a database**

➤ **Writing Queries using advanced concepts of SQL**

➤ **Programming PL/SQL including procedures, functions, cursors and triggers**

COURSE OUTCOMES

At the end of the course the student will be able to:

| CO	OUTCOMES
CO1	Apply the database concepts, technology and create the relations by specifying primary and foreign keys.
CO2	Construct a database by using data definition, data manipulation and control languages.
CO3	Build PL/SQL programs including stored procedures, functions, cursors and Triggers.
CO4	Design a Database application and retrieve the values with the help of queries using SQL.

CO-PO-PSO MAPPING:

CO No.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	-	3	-	-	-	-	-	-	2	2	-
CO2	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO3	3	2	2	2	3	-	-	-	-	-	-	3	2	-

| CO4 | 3 | 2 | - | - | 3 | - | - | - | - | - | - | 2 | 2 | 2 |
| AVG | 3.0 | 2.0 | 1.5 | 2.0 | 3.0 | - | - | - | - | - | - | 2.3 | 2 | 2 |

CO-PO-PSO JUSTIFICATION:

CO No.	PO/ PSO	CL	Justification
CO1	PO1	3	The student becomes able to design a database and include integrity Constraints in it for data storage.
	PO2	2	The student can analyze a problem based on its data requirements.
	PO3	1	The student can design the structure of the tables based on the given problem.
	PO5	3	The student becomes well versed in using oracle tool (SQL PLUS) for designing database solutions.
	PO12	2	The student becomes well versed in using SQL plus for designing database solutions.
	PSO1	3	The student is able to understand the basics of database design and its core principles and apply them for application software development.
CO2	PO1	3	The student is able to construct the database using any SQL commands.
	PO12	2	The student becomes well versed in using SQL plus for constructing database.
	PSO1	2	The student is able to use the concepts of database design in application development.
	PO1	3	The student is able to retrieve the data from the database using any SQL commands.
	PO2	2	The student can analyze a query and resolve based on problem statement.
	PO3	2	The student can apply different design solutions such as schema diagram, ER diagrams for the given problem.

CO3	PO4	2	Define a problem, its scope and importance for the purpose of investigation such as Relational Design and analyze the tool such as Oracle 10g etc.
	PO5	3	Ability to select and apply discipline-specific tools, techniques and resources like oracle 10g.
	PO12	3	Identify deficiencies like Assertions, Triggers and Procedures in knowledge and demonstrate an ability to source information to close this gap.
	PSO1	3	The student is able to use the concepts of database design in application development to retrieve the data.
CO4	PO1	3	The student gets a general knowledge about how to design and develop a database application
	PO2	2	The student gets an idea on how to work as a team to analyze a given problem definition.
	PO5	3	The student is able to use modern tools to develop a small database project by working as a team.
	PO12	2	The student is able to perform database connectivity from front-end applications.
	PSO1	2	The student is made able to design and develop small sized applications using databases in the back-end.
	PSO2	2	The student gets a general knowledge about how to design and develop a mini project.
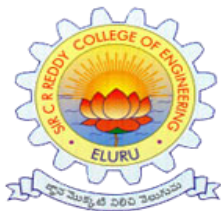
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SYLLABUS

List of Exercises:

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.

2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.

3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

5.

   i. Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

   ii. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.

7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISEAPPLICATION ERROR.

8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

10. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

11. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

12. Create a table and perform the search operation on table using indexing and non-indexing techniques.

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