



SILVER OAK UNIVERSITY

Computer Application
Integrated M.Sc(IT)
Subject Name: Relational DBMS
Subject Code:
Semester: 3rd

Prerequisite: Database Management Systems

Objective: To provide fundamentals of transaction processing and concurrency control as well as to develop skills of procedural SQL programming for designing database applications.

Teaching and Examination Scheme:

| Teaching Scheme | | | Credits C | Evaluation Scheme | | | | Total Marks |
|-----------------|---|---|--------------|-------------------|----|----------|----|----------------|
| L | T | P | | Internal | | External | | |
| | | | | Th | Pr | Th | Pr | |
| 4 | 0 | 2 | 5 | 40 | 20 | 60 | 30 | 150 |

Content:

| Unit No. | Course Contents | Teaching Hours | Weightage % |
|----------|---|----------------|-------------|
| 1. | Relational Algebra Structure of Relational Database, Domain, Keys of Relations, Relational Algebra : Selection Operation, Projection Operation, Joining Operation, Outer join Operation, Union Operation, Difference Operation, Intersection Operation, Cartesian Product Operation, Division Operation, Examples of queries in Relation Algebraic using symbols, Set operators: Union, union all, Intersect, Minus | 8 | 15 |
| 2. | E-R Models Explain E – R concepts Entity, Relationship, Attributes, E – R Diagram symbols, Conversion of Entity – Relationship Model into Relations, Problems with Entity – Relationship Models, Specialisation and Generalisation | 8 | 12 |
| 3. | Introduction to Procedural SQL Introduction RDBMS: E.F. Codd's Rule, DBMS vs. RDBMS, Advanced Data Types, Conditional Statements, Looping Statements, Exceptional Handling. | 7 | 12 |

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|----|---|---|----|
| 4. | Application Development using Procedural SQL Overview of Function and Procedure, Function and Procedure Usage, Creation of Stored Procedure, Calling Stored Programs from Stored Programs, Creation of User Defined Function, Calling Function from Stored Programs | 8 | 14 |
| 5. | Working with Cursor Overview of Cursor, Types of Cursor, Cursor Declaration, Cursors : OPEN CLOSE and FETCH, Advantages and Disadvantages of Cursor | 7 | 15 |
| 6. | Triggers Triggers and Their Features, Types of Triggers, Trigger Events, Trigger Creation, Implementation of BEFORE and AFTER Trigger, Error Handling in Trigger, Restriction on Trigger | 6 | 18 |
| 7. | Concurrency Control Need of Concurrency Control, Types of Locks and System Lock Tables, Serializability by Two-Phase Locking, Dealing with Deadlock and Starvation, Timestamp Ordering | 8 | 14 |

Course Outcome:

| Sr. No. | CO statement | Unit No |
|---------|--|---------|
| CO-1 | Recognize the various elements of relational algebra. | 1,2 |
| CO-2 | Understanding the various entity relationship concept. | 3 |
| CO-3 | Understanding the various concept of PL/SQL | 2,3 |
| CO-4 | Solve the given problem using Relational Algebra, Relational Calculus, SQL and PL/SQL | 4, 5,6 |
| CO-5 | Apply and relate the concepts of transaction, concurrency control, recovery and security in database | 7 |

List of Experiments/Tutorials:

- 1) Implement SQL queries to perform various DDL Commands. (Create minimum 5 tables with different datatypes and operation).
- 2) Implement SQL queries to perform various DML Commands. (Insert minimum 10 rows using different insert methods, edit and remove data using update and delete commands).
- 3) Retrieve data using SELECT command and various SQL operators.
- 4) Executing Data Conversion functions such as To_char(), To_Number() and To_date(). Execute various Date functions and also display special date formats using To_char() function.
- 5) Executing Queries using the Select Command with Where, Having ,Group by and order by clauses also execute the queries using aggregate functions

- 6) Execute the queries for implementation of Inner, Outer and Cross Join.
- 7) Executing DCL commands in SQL.
- 8) Implementation of Views.
- 9) Execute Indexes, Sequences, Snapshots and synonyms in SQL.
- 10) Write the basic PL/SQL Programs and also Write a PL/SQL programs using if then else, for, while and nested loop.
- 11) Write a PL/SQL code to implement implicit and explicit cursors.
- 12) Write PL/SQL Programs based on Exceptions handling. (Predefined and user-defined exceptions)
- 13) Write PL/SQL code for creating Procedures, functions and database triggers.
- 14) Write a PL/SQL code to lock the table in shared mode and exclusive mode.

Major Equipment:

Computer system with DBMS system

Books Recommended: -

- 1) Database System Concepts by Henry Korth(Tata McGraw Hill)
- 2) SQL ,PL/SQL the Programming language of Oracle by Ivan Bayross, BPB Publication.
- 3) “An introduction to Database Systems”, C J Date, Pearson.

List of Open Source Software/learning website:

1. wileyIndia.com or DreamtechPress.com
2. www.williamstallings.com