

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD

Semester : Third

Subject Title : Relational Database Management Systems

Subject Code : 12065

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
04	--	04	03	100	--	25#	25@	150

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

Rationale:

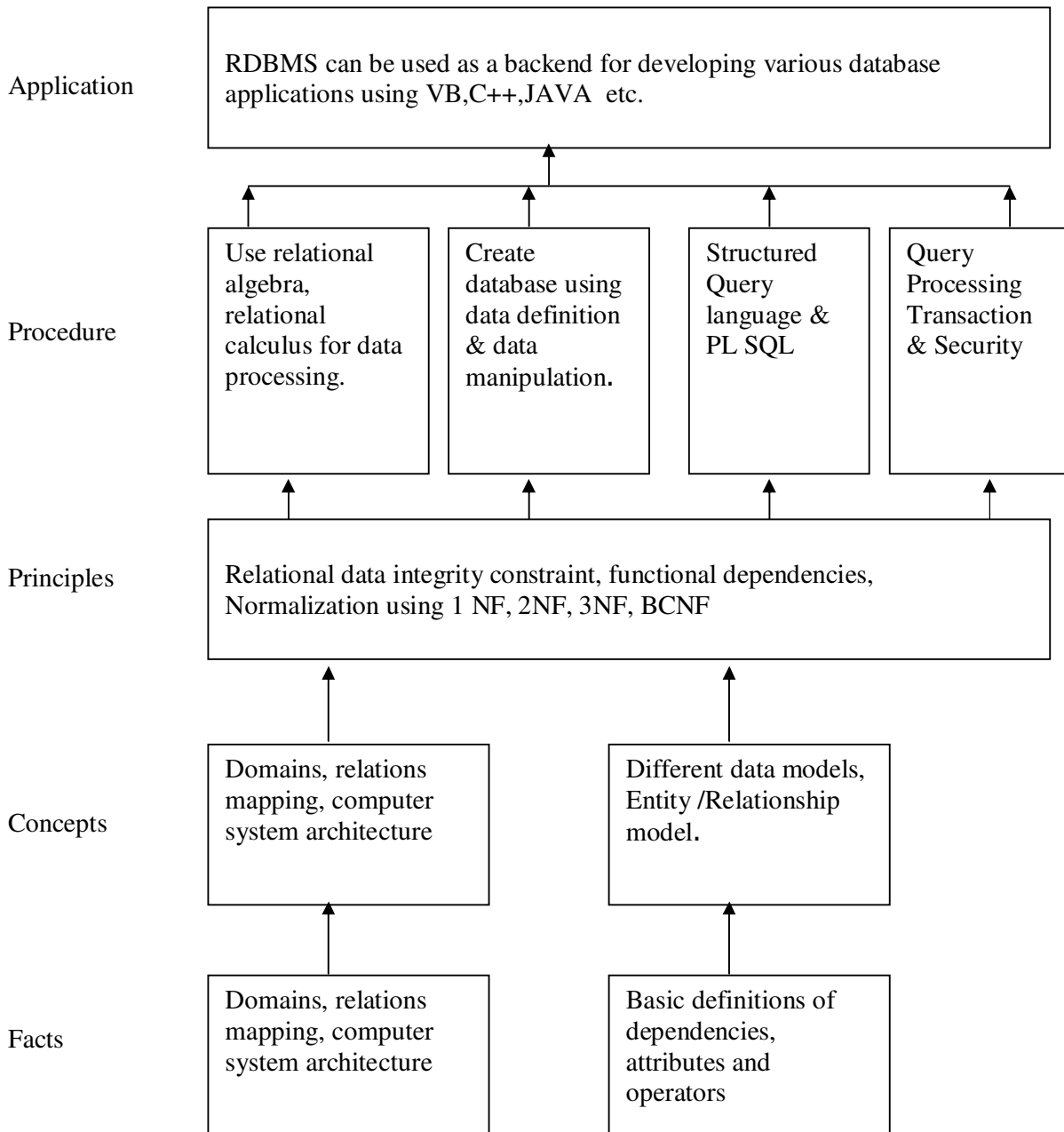
The primary resource that fuels knowledge power is the database. Organizations are employing mechanisms to effectively manage and utilize the data stored in the databases. Relational Database management system has been developed to harness the information stored in the database.

The database management system is a collection of programs that enables to store, modify and extract information from a database. After learning this subject, the students will be able to understand the designing of RDBMS and can use any RDBMS package as a backend for developing database applications.

Objectives: The student will be able to:

- 1) Understand the concept of Database system and Client Server Architecture
- 2) Understand and develop the concepts of Data Modeling, Security and Integrity.
- 3) Understand and execute different SQL queries and PL / SQL programs.
- 4) Normalize the database using normal forms.
- 5) Understand the concept of query processing and Transaction processing.

Learning Structure:



Contents : Theory

Chapter	Name of the Topic	Hours	Marks
01	Database System Concept & Data Modeling	12	20
	1.1 Basic concepts, Disadvantages of file processing system, Advantages of a DBMS over file processing system, Data Abstraction, Database Languages, Instance and Schema, Data Independence-Logical and Physical data Independence. 1.2 Database Users, Functions of Database Administrator Components of a DBMS and overall structure of a DBMS- Query Processor and Storage Manager. 1.3 Data Models: <ul style="list-style-type: none"> • Network Model • Hierarchical Model • E-R Model-Entity Sets, Mapping Cardinalities. • Comparison of all models 1.4 Introduction to Client Server Architecture.		
02	Relational Data Model and Security and Integrity Specification	10	16
	2.1 Relational Model: Basic concepts, attributes and domains, Keys concept: Candidate and primary Key, Integrity constraints: Domain, Entity Integrity constraints, Referential constraints and On delete Cascade. 2.2 Security and Authorization, Data Control language 2.3 Query Languages: <ul style="list-style-type: none"> • Relational Algebra • Relational Calculus-Domain and Tuple Calculus. 2.4 Creating Views and all options of views.		
03	SQL and PL-SQL	18	24
	3.1 Introduction to SQL queries, <ul style="list-style-type: none"> • Creating, Inserting, Updating and deleting tables (DDL), DML Statements. • Using constraints. • Renaming attributes, logical, relational, Set operators, In and NOT In ,Is NULL and Is NOT NULL, Aggregate functions, group by and having clause ,string functions ,date and time functions, Nested sub queries, Join concepts-Equi Join,Self Join,Non Equi Join,Outer joins. 3.2 PL/SQL Introduction, PL/SQL block structure, variables, SQL statements in PL/SQL, PL/SQL control Structures 3.3 Cursors, Triggers, Functions		
04	Relational Database Design, Storage and File systems.	12	20
	4.1 Purpose of Normalization, Data redundancy and updating anomalies, Functional Dependencies and Decomposition, Process of Normalization using 1NF, 2NF, 3NF, multivalued dependencies and BCNF. 4.2 E-R Model details-Types of attributes ,Role Indicator, Weak		

	4.3 and Strong entity sets, Specialisation and Generalisation. File Organization, Organization of records in files, Basic concept of Indexing-Order Indices, Primary and Secondary Indices ,Dense and Sparse Index, Sequential Indexing ,Multilevel Indexing and Hashing.		
05	Query Processing and Transaction Processing	12	20
	5.1 General strategies for query processing, Laws of Equivalence Expressions. 5.2 Concept of transaction, States of transactions, Serial Execution, Concurrent Execution, Serializability Recoverability, Transaction Definition in SQL. 5.3 Lock based protocols: share & exclusive mode, Protocols: <ul style="list-style-type: none"> • 2 phase locking • Time-Stamp based • Validation based 5.4 Deadlock handling, Wait for graph <ul style="list-style-type: none"> • Deadlock prevention Scheme, • Deadlock Detection Scheme & recovery scheme 		
Total		64	100

Practical:

Skills to be developed:

Intellectual skills:

1. Develop the fields of data base
2. Decide proper specifications
3. Query Processing and transaction processing

Motor skills:

1. Prepare appropriate data tables
2. Sequential writing of steps

List of Practical:

- 1) Creating & Executing DDL in SQL.
- 2) Creating & Executing Integrity constraints in SQL.
- 3) Creating & Executing DML in SQL.
- 4) Executing relational, logical and mathematical set operators using SQL.
- 5) Executing group functions
- 6) Executing string operators & string functions.
- 7) Executing Date & Time functions.
- 8) Executing Data Conversion functions.

- 9) Executing DCL in SQL.
- 10) Executing Sequences and synonyms in SQL.
- 11) Execute 50 SQL queries (operators, functions, clauses, join concepts)
- 12) Program for declaring and using variables and constant using PL/SQL.
- 13) Program using if then else in PL/SQL
- 14) Program using for loop & while loop in PL/SQL.
- 15) Program using nested loop in PL/SQL.

Learning Resources:

Books:

Sr .No.	Author	Title	Publisher
01	Korth	Database System Concepts	Sudarshan
02	2006 ISRD Group	Introduction to Database Management Systems	Tata McGrawHill.
03	Bipin Desai	An Introduction to Database System	Galgotia Publication
04	C.J Date	An Introduction to Database System	--
05	Allen	Introduction to Relational Databases and SQL programming	Tata McgrawHill