

K.R.K GOVERNMENT DEGREE COLLEGE
Department of Computer Science, Lesson Plan

Name of the Department : Computer Science	
Name of the Lecturer : D.SIVA PHANINDRA	
Group / Course : II B.Sc(comp)., Semester III	
Paper : Database Management Systems	
Name of the Topic	Overview of Database Management System
Hours Required	12
Learning Objectives	Understand the meaning of Data, Information, Database, Database management systems File-based system approach and Drawback of file-Based System database approach and advantages of database approach Classification of Database Management System Components of Database Management System Various Data Models Three schema architecture of data base.
Previous Knowledge to be reminded	Basic data and file structures, basic programming concepts
Topic Synopsis	Data means known facts that can be recorded and have an implicit meaning. Information is processed data. Information is used to reveal the meaning of data. Database is a collection of related data. Database Management System (DBMS): It is software to facilitate the creation and maintenance of a computerized database. Database System: Database system is the DBMS software together with the data itself. Sometimes, the applications are also included. The main objectives of Database Management System are Data Availability, Data Integrity, Data Security, Data Independence and Data Backup and recovery. File: A file is a collection of records. File system: A file system is a store organization computer files, which is better than manual file management. The drawbacks of File system are Structural Dependency, Data Dependency, Limited data Sharing, Data Redundancy, Data Inconsistency, Integrity Problems and Difficulty in Accessing Data. The database approach is an improvement on the shared file solution as the use of a database management system (DBMS) provides facilities for querying, data security and integrity, and allows simultaneous access to data by a number of different users. The DBMS provides several advantages when compared to File-Based system are : Improved Data Sharing, Minimized Data Redundancy, Minimized Data Inconsistency , Improved Data Access, Improved Decision-Making, Improved Data Quality, Improved Data Security, Increased End-user's Productivity, Multi

	user data access and Backup and recovery management The Databases are classified based on I. The no. of Users: Single-User Database or Multi-User Database. The Multi-User Database is divided into two types. They are 1) Work Group Database (≤ 50 users) and 2) Enterprise Database (> 50 users) II. The Database Locations: The Database locations determines, whether the database is Centralized Database or Distributed Database. III. The Use of Database: Today Databases are classified based on the Use of the Database. Those are Operational Database and Data Warehouse. Data models are collection of tools for describing the Data, Data relationships, Data semantics and Data constraints. DBMS's are categorized based on the data model, they are Relational, Object Oriented, Object-Relational, Hierarchical, Network, and other. The database system is composed of the five major parts : Hardware, Software, People, Procedures and Data. The different types of People are System Administrator, Database Administrator, System Developer and End-users etc. A database system has several subsystems: transaction manager subsystem, query processor and storage manager subsystem etc. The three schema architecture is also called ANSI/SPARC architecture or three-level architecture. The three schema architecture is also used to separate the user applications and physical database. The three schema architecture contains three-levels, physical or internal level, conceptual level and external level
Thrust Areas	
Skills to be learnt by Students	Database basics, DBMS types, architecture and levels of abstraction DBMS.
Examples / Illustrations	
Additional Inputs	
Teaching Aids Used	Yes
References Cited	DBMS by Korth, DBMS by Navathe, DBMS by Raghu Rama Krishnan
Student Activity Planned after Teaching	Group discussion
Any other Activities	Assignment

K.R.K GOVERNMENT DEGREE COLLEGE
Department of Computer Science, Lesson Plan

Name of the Department : Computer Science	
Name of the Lecturer : D.SIVA PHANINDRA	
Group / Course : II B.Sc(comp)., Semester III	
Paper : Database Management Systems	
Name of the Topic	Entity-Relationship Model
Hours Required	12
Learning Objectives	Understand the building blocks of an entity relationship diagram, Identify the classification of entity sets, attribute classification, relationship degree, relationship classification Explore the Reducing ER diagram to tables Explore the enhanced entity-relationship model (EER model), generalization and specialization, IS A relationship and attribute inheritance, constraint on specialization and generalization Explore the Advantages of ER modeling.
Previous Knowledge to be reminded	Basic data and file structures, basic mathematical concepts, DBMS basics
Topic Synopsis	An Entity-Relationship Model (ERM) is a detailed graphical representation of the data for an organization. An E-R model is normally expressed through E-R Diagrams (ERD). The basic components of an E-R model are: Entity, Attribute and Relationship. An Entity is a person, place, object, event, concept in the user environment, represented by rectangular box. Entity sets can be classified into three types. They are Strong Entity, Weak Entity and Associative Entity. Attributes are the properties or characteristics of an Entity. These attributes are classified based on value and structure. Based on value, the attributes can be classified into Single Valued, Multi Valued, Derived, and Identifier Attributes. Based on structure, the attributes can be classified into Simple and Composite Attributes. A Relationship is an association (connection) between the Entities. Relationships are represented by placing its name inside the diamond. The degree of relationship is the number of entities that are participate in that relationship. There are 3 most common relationship degrees. They are Unary Relationship, Binary Relationship and Ternary Relationship. Relations can be reduced into tables. EER is a high-level data model that incorporates the extensions to the original ER model. It is a diagrammatic technique for displaying the following concepts: Sub Class and Super Class, Specialization and Generalization, Union or Category, or Aggregation.

	The property of inheritance enables (allow) an entity subtype to inherit the attributes and relationships of the super type. A super type contains those attributes that are common to all of its subtype. In contrast, subtypes contain only the attributes that are unique to the subtype. One important inheritance characteristic is that all entity subtype inherits their primary key attribute from their super type. Aggregation is a process that represents a relationship between a whole object and its component parts. It abstracts a relationship between objects and viewing the relationship as an object. IS A relationship supports attribute inheritance and relationship participation. In the EER diagram, the subclass relationship is represented by ISA relationship. Attribute inheritance is the property by which subclass entities inherit values for all attributes of the super class. There are three constraints that may apply to a specialization/generalization: membership constraints, disjoint constraints and completeness constraints. Relationships among relationships are not supported by the ER model. Groups of entities and relationships can be abstracted into higher level entities using aggregation. Aggregation represents a "HAS-A" or "IS-PART-OF" relationship between entity types. Advantages of ER Diagram: The ER modeling provides an easily understood pictorial map for the database design. It is possible to represent the real world problems in a better manner in ER modeling. The conversion of ER model to relational model is straightforward. The enhanced ER model provides more flexibility in modeling real world problems. The symbols used to represent entity and relationships between entities are simple and easy to follow.
Thrust Areas	
Skills to be learnt by Students	Database design through ER-model and reducing the ER diagram into tables
Examples / Illustrations	Few the ER diagram into tables
Additional Inputs	
Teaching Aids Used	Yes
References Cited	DBMS by Korth, DBMS by Navathe, DBMS by Raghu Rama Krishnan
Student Activity Planned after Teaching	Group discussion
Any other Activities	Assignment

K.R.K GOVERNMENT DEGREE COLLEGE
Department of Computer Science, Lesson Plan

Name of the Department : Computer Science	
Name of the Lecturer : D.SIVA PHANINDRA	
Group / Course : II B.Sc(comp)., Semester III	
Paper : Database Management Systems	
Name of the Topic	Relational Model
Hours Required	12
Learning Objectives	CODD Rules, relational data model, concept of key, relational Integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form
Previous Knowledge to be reminded	Basic data and file structures, basic database concepts, mathematical knowledge
Topic Synopsis	Relational Model represents how data is stored in Relational Databases. A relational database stores data in the form of relations (tables). Dr Edgar F. Codd, after his extensive research on the Relational Model of database systems, came up with twelve rules of his own, which according to him, a database must obey in order to be regarded as a true relational database. Keys are also used to establish relationships between the different tables and columns of a relational database. Referential integrity refers to the relationship between tables. Because each table in a database must have a primary key, this primary key can appear in other tables because of its relationship to data within those tables. Relational algebra is a procedural query language. It gives a step by step process to obtain the result of the query. It uses operators to perform queries. Five basic operations in relational algebra: Selection, Projection, Cartesian product, Union, and Set Difference. The usage of relational algebra and relational calculus in the manipulation of the relations between the tables ensures that there is no ambiguity Relational algebra cannot perform arithmetic operations. It is unable to do aggregation operations even it cannot compute transitive closure. It cannot modify the data present in the database. Relational Algebra specifies the order in which operations are to be performed. Relational Calculus (non-procedural) specifies no such order of executions for its operations. Relational Calculus exists in two forms: Tuple Relational Calculus (TRC)

	Domain Relational Calculus (DRC) In relational database theory, a functional dependency is a constraint between two sets of attributes in a relation from a database. Normalization is the process of minimizing redundancy from a relation or set of relations. First normal form A table is in the first normal form if it contains no repeating columns. Second normal form A table is in the second normal form if it is in the first normal form and contains only columns that are dependent on the whole (primary) key. Third normal form A table is in the third normal form if it is in the second normal form and contains only columns that are non-transitively dependent on the primary key.
Thrust Areas	
Skills to be learnt by Students	Relational model concepts and normalize the database design
Examples / Illustrations	
Additional Inputs	
Teaching Aids Used	Yes
References Cited	DBMS by Korth, DBMS by Navathe, DBMS by Raghu Rama Krishnan
Student Activity Planned after Teaching	Group discussion
Any other Activities	Assignment

K.R.K GOVERNMENT DEGREE COLLEGE
Department of Computer Science, Lesson Plan

Name of the Department : Computer Science	
Name of the Lecturer : D.SIVA PHANINDRA	
Group / Course : II B.Sc(comp)., Semester III	
Paper : Database Management Systems	
Name of the Topic	Overview of Database Management System
Hours Required	12
Learning Objectives	Commands in SQL, Data Types in SQL, Data Definition language, Selection Operation, Projection Operation, Aggregate functions Data Manipulation Language, Table modification Commands, Join Operation, Set Operations. View, sub Query
Previous Knowledge to be reminded	Database concepts, relational model concepts
Topic Synopsis	SQL is Structured Query Language, which is a computer language for storing, manipulating and retrieving data stored in a relational database. The standard SQL commands to interact with relational databases are CREATE, SELECT, INSERT, UPDATE, DELETE and DROP. In these, create, alter, drop, truncate are ddl commands, select, insert, delete, update are dml commands, grant and revoke are dcl commands. In relational terminology, selection is defined as taking the horizontal subset of rows of a single table that satisfies a particular condition and projection is defined as taking a vertical subset from the columns of a single table that retains the unique rows. SQL aggregation function is used to perform the calculations on multiple rows of a single column of a table. It returns a single value. It is also used to summarize the data. Example: count, sum, avg, max, min.. Etc In SQL JOIN, A JOIN clause is used to combine rows from two or more tables, based on a related column between them. Different types of joins: left, right, full, and outer. The SQL Set operation is used to combine the two or more SQL SELECT statements. Types of Set Operation: Union, UnionAll, Intersect And Minus In SQL, a view is a virtual table based on the result-set of an SQL statement. A Subquery or Inner query or a Nested query is a query within another SQL query and embedded within the WHERE clause. A subquery is used to return data that will be used in the main query as a condition to further restrict the data to be retrieved.
Thrust Areas	Programming Design

Skills to be learnt by Students	SQL Commands
Examples / Illustrations	SQL Queries on Company and banking database
Additional Inputs	
Teaching Aids Used	Yes
References Cited	DBMS by Korth, DBMS by Navathe, DBMS by Raghu Rama Krishnan
Student Activity Planned after Teaching	Group discussion
Any other Activities	Assignment

K.R.K GOVERNMENT DEGREE COLLEGE
Department of Computer Science, Lesson Plan

Name of the Department : Computer Science	
Name of the Lecturer : D.SIVA PHANINDRA	
Group / Course : II B.Sc(comp)., Semester III	
Paper : Database Management Systems	
Name of the Topic	Overview of Database Management System
Hours Required	12
Learning Objectives	Shortcomings of SQL, Structure of PL/SQL , PL/SQL Language Elements, Data Types, Operators Precedence. Control Structure, Steps to Create a PL/SQL, Program, iterative, Control, Procedure. Function, Database Triggers, Types of Triggers.
Previous Knowledge to be reminded	Database concepts, programming skills and sql commands
Topic Synopsis	PL/SQL is a block structured language that enables developers to combine the power of SQL with procedural statements. A PL/SQL block consists of three sections: declaration, executable, and exception-handling sections. PL/SQL has two kinds of data types: scalar and composite. The scalar types are types that store single values such as number, Boolean, character, and date and time whereas the composite types are types that store multiple values, for example, record and collection. PL/SQL language is rich in built-in operators and provides the following types of operators - Arithmetic operators, Relational operators, Comparison operators, Logical operators and String operators. PL/SQL Control Structures are used to control flow of execution. The flow of control statements can be classified into the following categories: Conditional Control, Iterative Control and Sequential Control. PL/SQL allows the use of an IF statement to control the execution of a block of code. In PL/SQL, the IF -THEN - ELSIF - ELSE - END IF construct in code blocks allow specifying certain conditions under which a specific block of code should be executed. PL/SQL supports the following structures for iterative control: Simple loop : In simple loop, the key word loop should be placed before the first statement in the sequence and the keyword end loop should be written at the end of the sequence to end the loop. The create function statement lets you create a udf. For example, you can code a SQL expression to compute a scalar value inside the create function statement. TRIGGERS are stored programs that are fired by Oracle engine automatically when DML Statements like insert, update, delete are executed on the table or some events occur.

	Triggers can be classified based on the following parameters. Classification based on the timing BEFORE Trigger: It fires before the specified event has occurred. AFTER Trigger: It fires after the specified event has occurred. INSTEAD OF Trigger: A special type. You will learn more about the further topics. (only for DML) Classification based on the level STATEMENT level Trigger: It fires one time for the specified event statement. ROW level Trigger: It fires for each record that got affected in the specified event. (only for DML).
Thrust Areas	
Skills to be learnt by Students	Programming with PL/SQL
Examples / Illustrations	Basic programs like interest calculation, class marks percentage and ranks
Additional Inputs	
Teaching Aids Used	Yes
References Cited	DBMS by Korth, DBMS by Navathe, DBMS by Raghu Rama Krishnan
Student Activity Planned after Teaching	Group discussion
Any other Activities	Assignment