

Programme/Class: Certificate	Year: First	Semester: Second
Subject: Computer Science		
Course Code: B070201T	Course Title: Database Management System	
Course outcomes: After the completion of the course the students will be able to: 1. Understands the basic concepts of data base management systems. 2. Design E-R diagrams for real world applications. 3. Formulate relational algebraic expressions using relational data models and languages. 4. Apply normalization transaction properties and concurrency control to design database. 5. Analyze the security algorithms for database protection.		
Credits: 4		Core Compulsory
Max. Marks: 25+75		Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0		
Unit	Topic	No. of Lectures
I	Introduction: Database System Concepts, File system vs. database system, Database system architecture, Data models and their types, Data base scheme and instances, Data independence, Database Languages and Interfaces.	7
II	Data Modeling Concepts ER model concepts: Notations for ER diagram, Extended E-R diagram, Extended E-R model, E-R model design issues, constraints, and keys: Weak entity set strong entity set, Relationships of higher degree.	8
III	Relational model concepts: code rules, constraints, Relational Algebra operations, Extended relational algebra operations, Relational Calculus, Tuple and Domain relational calculus.	7
IV	Database Design Functional dependencies, Normal forms, First, second, and third normal forms, BCNF, Multi-valued dependencies and Fourth Normal form, Join Dependencies and Fifth Normal form.	8
V	Transaction, Query Processing Transaction and system concepts: transaction states, ACID properties of transactions, concurrent execution schedules and Recoverability, Serializability of schedules. Query Processing and Optimization: Measures of Query cost, Cost, Evaluation of expression. Optimization: Transformation of relational expression, Choice of evaluation plan.	7
VI	Concurrency Control: Concurrency Control Techniques: Two phase Locking Techniques for Concurrency Control; Time stamping in Concurrency control.	8
VII	Introduction to SQL Basic Structure of SQL Query, Set operators, SELECT, UNION, INTERSECT, and EXCEPT, Nested queries, Aggregate function, Null values, Derived Relations, Modification of the Database, Joined relations and up-dates in SQL.	8
VIII	Database Security	

	Importance of data, Threats and risks, Users and database privileges, Access Control, Security for Internet Applications, Role of Database Administrator.	7
Suggested Readings: <ol style="list-style-type: none"> 1. Henry F. Korth and Abraham Silberschatz, "Database System Concepts," Second Edition, McGraw Hill, 1991. 2. AtulKahate, "Introduction to Database Management Systems," Pearson India, 2004. 3. Raghu Ramakrishnan and Johannes Gehrike, "Database Management Systems," Third McGraw Hill, Edition, 2003. 4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and application Programming, 6 Edition, Pearson Education, 2013. 5. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010. 6. C.J Date " An Introduction to Database Systems", Addison Wesley 		
This course can be opted as an elective by the students of following subjects: B. Sc in Engineering and BCA		
Suggested Continuous Evaluation Methods:		

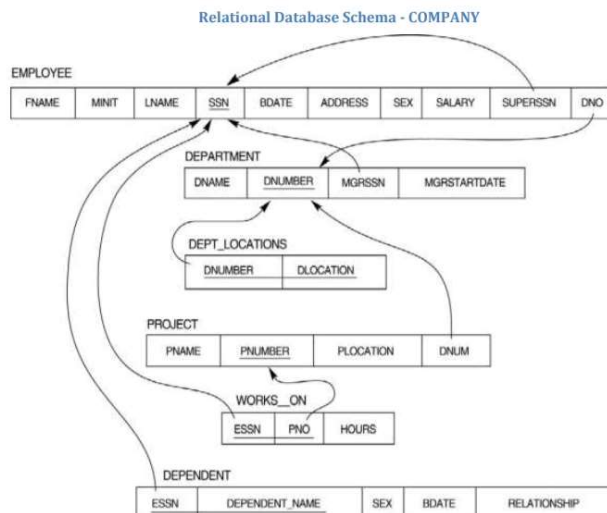
Programme/Class: Certificate	Year: First	Semester: Second
Subject: Computer Science		
Course Code: B070202P	Course Title: Database Management Systems Lab	
Course outcomes:		
Ability to:		
1. Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations.		
2. Design and implement a database schema for a given problem.		
3. Do connectivity of PHP and MySQL to develop applications.		
Credits: 2	Max. Marks: 25+75	Min. Passing Marks:
Total No. of Lectures-Tutorials-Practical (in hours per week): 0-0-4		
Suggested Readings:		
1. Paul DuBois, "MySQL Cookbook: Solutions for Database Developers and Administrators," Third Edition, O'Reilly Media, 2014.		
2. Frank M. Kromann, "Beginning PHP and MySQL: From Novice to Professional," Fifth Edition, Apress, 2018.		
3. Joel Murach and Ray Harris, "Murach's PHP and MySQL," First Edition, Mike Murach & Associates, 2010.		
4. Luke Welling, Laura Thomson, "PHP and MySQL Web Development," Fourth Edition, Addison-Wesley, 2008.		

Software Lab based on Database Management Systems

Note: PHP/MySQL may be used

List of Experiments

1. Creation of databases and execution of SQL queries.
2. Creation of Tables using MySQL: Data types, Creating Tables (along with Primary and Foreign keys), Altering Tables and Dropping Tables.
3. Practicing DML commands- Insert, Select, Update, Delete.
4. Practicing Queries using ANY, ALL, IN, EXISTS, NOT, EXISTS, UNION, INTERSECT, and CONSTRAINTS, etc.
5. Practice Queries using COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING, VIEWS Creation and Dropping.
6. Use of COMMIT, ROLLBACK and SAVEPOINT.
7. Practicing on Triggers - creation of trigger, Insertion using trigger, Deletion using trigger, Updating using trigger.
8. To remove the redundancies and anomalies in the above relational tables, Normalize up to Third Normal Form.



Questions to be performed on above schema

1. Create tables with relevant foreign key constraints
2. Populate the tables with data
3. Perform the following queries on the database :
 1. Display all the details of all employees working in the company.
 2. Display ssn, lname, fname, address of employees who work in department no 7.
 3. Retrieve the birthdate and address of the employee whose name is 'Franklin T. Wong'
 4. Retrieve the name and salary of every employee
 5. Retrieve all distinct salary values
 6. Retrieve all employee names whose address is in 'Bellaire'