Title: Database Management System

Course Synopsis: It introduces the fundamentals of database technology. Topics covered include: database concepts, Database System Architecture, E-R model, relational model, database design theory, database languages, transaction management, concurrency control and database recovery.

Goal: There are two principle objectives for this course.

- To introduce the fundamental concepts and methods necessary for the design and use of a database system.
- To provide practical experience in applying these concepts and methods using commercial database management systems.

Unit	Topic	Lecture	Assignment	Presentation	Lab
1	**Introduction to the Database Systems**	4			4
	Importance of Data & Data Management				
	How Data are stored in Database				
	Different Database Systems				
	Physical & Logical Structure of Database				
	Database Management Systems and Database Systems				
	Database Architecture				
	Difference Between Distributed Database & Relational Database				
	History				
2	**The Relational Data Models**	2			2
	Entity Relationship and Object		Asssignment on DB design	Group Presentation on Relational Model	
	ER Diagram				
	Importance of ER Diagram				
	Relational Model				
	Advantages and Disadvantages of E-R Data Model				
3	**Relational Algebra & Calculas**	2			2
	The fundamental operations of relational algebra Operators: Select, Project, Rename, Union, Intersection, Minus, Cartesian Product, Theta Join, Equijoin, Natural Join, Division				
	Unary & Binary Operator				
	Project				
	Union(Union, Union All,Intersect)				
	Set different(Minus Operation)				
	Cartesian product				

4	**SQL**	2			10
	Sql Introduction		Assignment covering CRUD operations		
	Types of Sql(DDL, DML, DCL)				
	Execution Process of Sql				
	Sql Fundamentals: Multi table Queries (Joins) Duplicate Rows Row Selection Search Conditions The Comparison Test (=, <,>, <=, >=) The Range Test (BETWEEN) The Set Membership Test (IN) The Pattern Matching Test (LIKE) The Null Value Test (IS NULL) Compound Search Conditions (AND, OR and NOT) Sorting Query Results (ORDER BY Clause) Developing Sub Queries				
5	**Conceptual Design**	2			4
	Conceptual Design Process				
	Requirement Analysis				
	Identify the Relation				
6	**Logical Design**	2			4
	Logical Design Process				
	Design Entity Relation Diagram				
	Create Tables and Constraint				
	Create Referential Keys				
7	**Normalization**	2			2
	Use of Normalization		Assignment on Normalization		
	Different form of Normalization				
8	**Database Technology**	2			N/A
	Different Database Technologies				
	Database Client & Server Processing				
	OLAP & OLTP Database Techniques				
9	**Distributed Architecture**	2			N/A
	Distributed Database Architecture				
	Advantages and Disadvantage of Distributed Database				
10	**Database Evaluation and Transaction**	4			N/A
	Transaction Management				
	ACID Properties				
	Database Evaluation Process				
12	**Data Analysis**	2			4
	Data Analysis process				
	Types of Data Analysis				
	Data Analysis Steps				

13	**Database and the World Wide Web**	2			1
	Web Data Management				
	Web Search				
	Web Crawling				