

Course Outline

Instructor: Umar Shafi

Class: MCS 1st Eve-A

Class Days: Mon-Tue

Course Name: Data Base Systems

Class Room: Room No 12

Class Timing: 05:00-06:30

Course Description:

This course will illustrate the important role that database systems play in an organization and provide you with a background to understand the subject, and a foundation upon which to build your management decisions. This course is designed to investigate how database management system techniques are used to design, develop, implement and maintain modern database applications in organizations.

Course Objectives:

This course will illustrate the important role that database systems play in an organization and provide you with a background to understand the subject, and a foundation upon which to build your management decisions. This course is designed to investigate how database management system techniques are used to design, develop, implement and maintain modern database applications in organizations.

Books Prescribed:

1. Database systems: principles, design, and implementation, Catherine M. Ricardo, Macmillan, 1990. ISBN: 9780023996658

2. Database Systems, C.J. Date, Addison Wesley Pub. Co. (2004)

3. Fundamentals of Database Systems by R. Elmasri and S. Navathe. 6th Edition, Addison-Wesley (2010). ISBN-10: 0136086209.

4. Modern Database Management by Fred McFadden, Jeffrey Hoofer, Mary Prescott, Prentice Hall; 11th Edition (July 26, 2012). ISBN-10: 0132662256

Testing and Grading:

Students will be assessed through term exams, assignments, quizzes, lab-work and presentation. Following will be the evaluation criteria:

Evaluation Type	Marks
Mid Term Examination	30
Final Term Examination	50
Session Evaluation	
Attendance	5
Behavior	5
Assignments, quizzes	10
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Total	20
Total	100

Course Lectures Breakup:

Week No.	Contents
01	Introduction, Advantages of DBMS and its User Database, Database management System (DBMS), Example of popular DBMS, Traditional File Processing System, Advantages and Disadvantages of Database Approach, Database Administrator: Functions of DBA, End Users
02	Detailed Diagrams and Database Design, Detailed DFD Diagrams Database design Life Cycle, Traditional System Analysis Approach, Staged Database Design Approach, Context DFD, Diagram 0, Detailed DFD, Data Dictionary with types and uses
03	Database Architecture Three Level Architecture, External/Conceptual Mapping, Conceptual/Internal Mapping, Logical and Physical Data Independence, Brief introduction of Database Models,
04	Entity-Relationship Data Model Introduction and Purpose of E-R Model, Entity and its Types, Attributes and its Types, Domain of Attribute, Relationship and its Types, Cardinality of Relationship
05	E-R Diagrams: Symbols with representation, Different ways to show cardinalities of relationship in E-R Diagrams, Working Example of E-R Model: Scenario Based Examples to explain how to identify Entities, Attributes and Relationship among different entities and how to draw a complete E-R Diagram
06	Key and its different types Super Keys, Candidate Keys, Primary Keys, Alternate / Secondary Keys, Foreign Keys Dependencies: Existence Dependency, Identifier Dependency, Referential Dependency
07	Logical Database Design, Relation Data Model Relational Model: Introduction, Uses and Advantages of Relational Model, Database Relations, Properties of Relations, Degree and Cardinality of a Relation, Integrity constraints: Entity Integrity, Referential Integrity
08	Relational Algebra SELECT Operator, PROJECT Operator, Product, Theta Join, Equijoin, Natural Join, Semi Join, Outer Join, Set Operations (Union, Difference, Intersection) Mapping an E-R Model to Relational Model (Basic Concepts)
	Mid Term Exam
09	Normalization Functional Dependency with examples, First Normal Form with examples, Full Functional Dependency with examples, Second Normal Form with examples, Transitive Dependency with examples, Third Normal Form with examples
10	Normalization Normalization Process with different examples to explain how to normalize an un-normalized data
11	Structured Query Language (SQL) Data Definition Language (DDL), Data Manipulation Language (DML), Different commands of SQL with different examples, SELECT Statement, Where Clause and Operators (Not, Between, IN, Like), Order By Clause, Having Clause, Functions
12	Structured Query Language (SQL) CREAT Statement, INSERT INTO Statement, DELETE Statement, UPDATE Statement
13	Views Introduction and Types of Views,

14	Transaction Transaction Management, Concept of a Transaction, Transactions and Schedules, Concurrent Execution of Transactions
15	Database Recovery Recovery Sequence, Check Points, Updates
16	Concurrency Control, Locking Concurrency control problems, Serial and interleaved schedules, Serializability theory, Introduction to locking
	Final Term Exam

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