CSC-252: Database Management System

General Information

Course Number	CSC-252
Credit Hours	3+1 (Theory Credit Hour = 3, Lab Credit Hours = 1)
Course Coordinator	Not Specified

Course Objectives

The aim of this course is to build the foundation of database design, implementation and management from theory and practical perspectives. The focus of this course would be on design and development of relational model and relational query languages associated with such model. It will also introduce some recent developments in databases such as semi-structured data and the relationship between databases. The basic concepts of concurrency control, Normalization, ER Model and transaction processing will also be covered. In addition to the theoretical concepts, the course through the lab section, and programming assignments and projects, will require students to use the Oracle and optionally MySQL database systems and develop term projects.

Catalog Description

CSC-252

Course Content

Session No.	Week No.	Topics	Suggested Readings (Chapters)
01-05	1-2	Introduction to DBMS • Database-System Applications • Views of Data • Database Languages • Relational Databases • Database Design • Data Storage and Querying • Transaction Management • Database Architecture • Database Users and Administrators	1
06-10	2-3	Introduction to the Relational Model • Structure of Relational Databases • Database Schema • Keys • Schema Diagrams • Relational Query Languages • Relational Operations	2
11-14	4-5	Relational Model • Relational Operations • Formal Relational Query Language • Relational Algebra	6

14-18	5-6	An algebraic Query Language o Natural Joins o Theta- Joins o Combining operations to form queries o Naming and renaming o Relationships among operations	6
First Mid Exams			
18-23	7 & 8	Functional-Dependency Theory Functional Dependencies (FDs) o Definition of FD o Keys of relations o Super Keys Rules about FDs o Reasoning about FDs o Armstrong's Axiom and inferencing Rule o Computing the closure of Attributes	8
24-26	9	Design of relational database schema o Anomalies o Decomposing Relations using FDs o Third Normal Form (3NF) and Boyce-Codd Normal Form (BCNF)	8
27-29	**10**	Overview of the Design Process The Entity-Relationship Model Constraints Removing Redundant Attributes in Entity Sets Entity-Relationship Diagrams Reduction to Relational Schemas Entity-Relationship Design Issues Extended E-R Features	7
30-33	11	Enhanced ER design From ERD to Relational Designs (translation) o From Entity sets to relations o From ER Relationships to Relations o Combining relations	
Second Mid Exams			
40-42	14	Transaction Management • Concurrency Control • Concurrency Control with locking methods • 2PL • Deadlock	14-15
43-45	15	Project Presentations and Revision	
Final Exams			

Text Book

Avi Silberschatz, Henry F. Korth, S. Sudarshan: "Database System Concepts", 6th Edition, McGraw-Hill

Reference Material

Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom:, "Database Systems: The Complete Book ", 3rd edition, Pearson Prentice Hall

Thomas Connolly, Carolyn Begg:, "Database Systems: A practical approach to design, implementation and Management ", 5th edition, Addison Wesley

Course Learning Outcomes

	Course Learning Outcomes (CLO)
1	Demonstrate core database concepts and explain database management system software components.
2	Apply normalization process to develop database design
3	Use database tools to design and develop abstract models in ERD.
4	Use SQL queries in Oracle DBMS using various IDEs for the development of application programs.
5	Express relational queries using Relational Algebra.
6	Understand XML technologies.

CLO-SO Map

	SO IDs											
CLO ID	**GA1**	**GA2**	**GA3**	**GA4**	**GA5**	**GA6**	**GA7**	**GA8**	**GA9**	**GA10**	**GA11**	**GA12**
CLO 1	1	0	0	0	0	0	0	0	0	0	0	0
CLO 2	1	0	0	0	0	0	0	0	0	0	0	0
CLO 3	0	0	1	0	0	0	0	0	0	0	0	0
CLO 4	0	0	1	0	0	0	0	0	0	0	0	0
CLO 5	0	0	0	0	1	0	0	0	0	0	0	0
CLO 6	0	0	0	0	1	0	0	0	0	0	0	0

Approvals

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Approved By	Not Specified
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