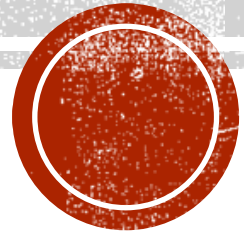
NMK20303 - DATABASE MANAGEMENT SYSTEM

Mohamed Elshaikh



SYNOPSIS

- This subject focuses on the concept of database system and architecture. This includes data models, schemas and instances, and system environment. Students will be exposed to data modeling by using high-level conceptual data models for relational database design that includes Entity Relationship Diagram(ERD), Structured Query Language(SQL) and normalization and also covers database storage and management.

CORSE OUTCOMES

1. Ability to EXPLAIN concepts of database system, database storage and management
2. Ability to WRITE and ANALYZE SQL statements
3. Ability to NORMALIZE and EVALUATE a relational database
4. Ability to DESIGN a relational database using Entity Relational Diagram.

TOPICS 1

#	Topics		Chapter
1	**Introduction To Database**	Database, database system, database storage Database approach, actor of the scene:- database administrators; database designers; end users; system analysts and apps programmers (software engineers), workers behind the scene. DBMS approach, databases. Database applications	CH 1
2	**Overview of Database Languages and Architectures**	Data models, schemas, and instances. Dbase schema architecture:- Internal level Conceptual level External/view level data independence: logical; physical Database languages and interfaces Database system environment: Centralized and client/server architectures for DBMS Classification of DBMS.	CH 2

TOPICS II

#	Topics		Chapter
3	**The Database Relational Model**	Relational model concepts: domain; entities; attributes; tuples; relations, relational model notation, relational model constraints, relational keys:- candidate key, foreign key, primary key, null values. Unary, binary, and ternary relationships. Data Types and Declaration Type	CH 5
4	**Standard Query Languages**	SQL commands for data manipulation: Simple queries, row selection, sorting results, the SQL aggregate functions, grouping results, sub-queries, multi-table queries, insert-update-delete statements. SQL commands for data definition: Creating table, creating view, drop table.	CH 6, 7

TOPICS III

#	Topics		Chapter
5	**The Normalization of Relational Model**	Relations, data redundancy and update anomalies, first normal form (1NF) second normal form (2NF) third normal form (3NF) Functional dependencies, transitive dependencies. Normalization, relationship of normal forms, normal form 1NF-2NF-3NF-BCNF	CH 14, 15
6	**Logical Database Design using Entity Relationship Diagram (ERD)**	Database design methodology, logical database design, physical database design. Entity types, relationship types, Relationship of degree: binary; ternary; quaternary, recursive attributes: simple; composite; single-value; multi-value; derive, keys: candidate; primary; composite; strong entity, weak entity, structural constraints: one-to-one; one-to-many; many-to-many. IDENTIFY and SOLVE problem with ER models: Fan trap; chasm trap.	CH 3, 4, 9

LABS

Lab 1 : Software Installation and Configuration
Lab 2 : The Relational Database Model
Lab 3 : SQL Commands for Data Definition
Lab 4 : SQL Commands for Data Manipulation 1
Lab 5 : SQL Commands for Data Manipulation 2
Lab 6 : Entity Relationship Diagram (ERD)

ASSESSMENT CONTRIBUTION

Assessment	Contribution
1 x **Final Exam – Indv**	40
1 x **Test – Indv**	10
2 x **Quiz – Indv**	10
Mini Project – Group: Proposal, Demo	20
Lab Demo – Indv	10

BOOK

1***	**Ramez Elmasri & Shamkant B. Narathe, 'Fundamentals of Database Systems', 7th Ed., Pearson Education, 2016**
2	Ramez Elmasri & Shamkant B. Narathe, 'Database Systems: Models, Languages, Design, and Application Programming', 6th Ed., Pearson Education, 2011
3	Thomas Connolly & Carolyn Begg, 'Database Systems: A Practical Approach to Design, Implementation, and Management', 5th Ed., Pearson Education, 2010
4	Jeffry A. Hoffer, V.Ramesh, Heikki Topi, 'Modern Database Management', 11th Ed., Pearson Education, 2013
5	Silberschatz, Korth & Sudarshan, 'Database System Concepts', 6th Ed., Addison-Wesley, 2010

CONTACT

- Mohamed Elshaikh
- Bumita Block C,
  - To be relocated at UniCiti
- 01344160069
- elsaikh@unimap.edu.my
- https://elshaikh.unimap.edu.my