CS 4620: DATABASE MANAGEMENT SYSTEMS

Semester Hours:	3.0	*Contact Hours:* 3
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Text:	Database Management Systems. 3rd Edition	
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Year:	2002	

SPECIFIC COURSE INFORMATION

Catalog Description:

Semantic models for conceptual and logical design of databases. Detailed study of relational systems: design, dependency and normal forms. Use of interactive and embedded query language. Overview of topics such as database connectivity, security and object-oriented systems. Prerequisite: Grade of C or better in CS 2020.

Course type: **ELECTIVE**

SPECIFIC COURSE GOALS

- I can describe the functions and advantages of a DBMS.
- I can classify the three popular data models by level of abstraction.
- I can explain 1NF, 2NF, 3NF, BCNF, and 4NF.
- I can apply the normalization process to create tables.
- I can use SQL effectively to create queries, views, and subqueries.
- I can use SQL commands in C++.
- I can use JDBC and SQL commands in Java.
- I can describe the type of relationships between entities.
- I can design entity-relationship diagrams to represent simple database application scenarios.
- I can use transactions, locks, and simple recovery schemes.
- I can form simple queries in relational algebra and calculus.

SOFTWARE ENGINEERING STUDENT OUTCOMES ADDRESSED BY THIS COURSE

- SE 1 An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- SE 2 An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

LIST OF TOPICS COVERED

- Background (*)
  - File processing vs DBMS
  - Model overview
  - Storage techniques
- Relational DBMS (*)
  - Dependency and Normal forms
  - SQL - Oracle
  - Embedded SQL - Oracle
  - Performance tradeoffs
- Database design (*)
  - Design goals
  - User views
  - Entity relationship model
  - Design examples
- Conventional models
  - Network model & CODASYL DBTG submodel
  - Hierarchical model
- Microcomputer dbms
- Object oriented database (*)
  - Multimedia
  - Managing objects
  - Postgres - free object database

- Advanced topics
  - Multidatabase systems
    - Context of corporate systems
    - Cooperative computing
    - Local & global schema
    - Schema integration
  - Security and recovery (*)
  - Enhanced ER models
    - EER to relational mapping
    - Knowledge representation
  - Client server architectures (*)
    - Query processing
    - Data replication
    - Update control

(*) This topic is core material to be covered every time the course is taught.