

## CS 5620: DATABASE MANAGEMENT SYSTEMS

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<i>Semester Hours:</i>	3.0	<i>Contact Hours:</i> 3
<i>Coordinator:</i>	Abbas Heydarnoori	
<i>Text:</i>	Database Management Systems. 3rd Edition	
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<i>Year:</i>	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: Admission to MS in CS program, or consent of department.

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.
- I can analyze relevant research and communicate my findings.

## 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.