

COURSE DESCRIPTION

Dept., Number	CS 4342	Course Title	Database Management
Semester hours	45 hours	Course Coordinator	Natalia Villanueva Rosales

Current Catalog Description

Introduction to database fundamentals, modeling, the use of database management systems for applications, and current trends for data management including: relational algebra, entity-relationship models, relational data models, semi-structured data models, schema design, query processing, data integrity, privacy, security and data analytics.

Level 1: Knowledge and Comprehension.

Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. The material has been presented only at a superficial level.

Upon successful completion of the course, students will be able to:

- 1a. Describe and compare data models (e.g., Entity-Relationship model, relational model, semi-structured model), how they have been used in the past, and how they are currently used for data management.
- 1b. Describe the components of a database system, the most common designs for core database system components including the query optimizer query executor, storage manager, access methods, and transaction processor their most common design, and give examples of their use.
- 1c. Cite the basic goals, functions, and models of database systems.
- 1d. Identify database languages and interfaces for data management.
- 1e. Critique an information application with regard to satisfying user information needs.
- 1f. Explain uses of declarative queries.
- 1g. Identify database architectures (e.g., centralized, distributed, web-based).
- 1h. Identify current trends of data management paradigms.
- 1i. Describe technical solutions to the challenges in information privacy, integrity, security, and preservation.
- 1j. Identify major database management systems functions and describe their role in a database system.
- 1k. Identify the careers/roles associated with information management

Level 2: Application and Analysis.

Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details.

Upon successful completion of the course, students will be able to:

- 2a. Demonstrate uses of explicitly stored metadata/schema associated with data.
- 2b. Use relational algebra and set theory that are supported in the relational model.
- 2c. Use a relational query language (e.g. SQL) to elicit information from a database.
- 2d. Normalize a database using the 1st, 2nd, and 3rd normal forms.

2e. Justify the use of relational or non-relational data management systems based on the requirements of an applications.

2f. Demonstrate the ability to work in teams.

Level 3: Synthesis and Evaluation.

Level 3 outcomes are those in which the student can apply the material in new situations. This is the highest level of mastery.

Upon successful completion of the course, students will be able to:

3a. Design a database system from a problem statement to a conceptual, high-level data model (e.g., Entity-Relationship) using standard notation and modeling principles.

3b. Design a relational data model from a conceptual data model.

3c. Design and implement a relational data model in a relational database schema using a database management system.

3d. Design and implement an interface for a database system applying best practices for usability, privacy and security.

Course Outcomes:

Textbook:

Elmasri, R. and S. Navathe (2017). *Fundamentals of Database Systems*. Seventh Edition. Ed. Pearson Education Limited. ISBN10: 0136086209.

Student Outcomes:

Not applicable

Prerequisites by Topic:

CS 2302 with a grade of “C” or better