

Computer Science 3311 – Database Management

Student Learning Outcomes

1. Students will be able to identify fundamental concepts and techniques of related database management, database technology, why databases are used, and the basic components of a database.
2. Students will be able to recognize the relational model and define key relational terminology and principles.
3. Students will be able to demonstrate the use of Structured Query Language, an international standard for creating and processing relational databases.
4. Students will be able to describe Data Modeling and the Entity-Relationship Model and demonstrate their understanding of these two types of models through successful completion of the practical lab exercises involving each type of model.
5. Students will be able to discuss the database design process and the Entity-Relationship Model.
6. Students will be able to transform a data model into a relational database design.
7. Students will be able to recognize and discuss the components and responsibilities of database management.
8. Students will be able to identify problems that occur when a database is concurrently processed by more than one user.
9. Students will be able to survey and discuss important advanced database concepts, including the use of databases to support web sites and Geographical Information Systems using spatial database software.

Course Content

Textbook: *Database Concepts*, 4th Edition, by David M. Kroenke and David J. Auer.

The following chapters including the particular sections listed are covered. (See textbook “Contents”)

1. Getting Started

- Why Use a Database?
- What is a Database System?
- Getting Started with Microsoft Access

2. The Relational Model

- Relations
- Types of Keys
- The Problem of Null Values
- Functional Dependencies and Normalization
- Working With Multiple Tables in Microsoft Access

3. Structured Query Language

- Getting Started with Microsoft SQL Server
- SQL for Data Definition
- SQL for Inserting Relational Data
- SQL for Relational Query

SQL for Relational Modification and Deletion
SQL for Table and Constraint Modification and Deletion
SQL Views

Working with Queries in Microsoft SQL Server

4. Data Modeling and the Entity-Relationship Model

The Requirements Stage

The Entity-Relationship Data Model

Entity-Relationship Diagrams

Developing and Example E-R Diagram

Prototyping using Microsoft Access

5. Database Design

Transforming a Data Model into a Database Design

Representing Entities with the Relational Model

Normal Forms

Representing Relationships

Database Design at an Imaginary Business Operation

Relationships in Microsoft Access

6. Database Administration

Continued Study of an Imaginary Business Operation

Concurrency Control

Cursor Types

Database Security

Database Backup and Recovery

Distributed Database Processing

Object-Relational Databases

Database Administration in Microsoft Access

7. Database Processing Applications and Business Intelligence

The Database Processing Environment

Web Database Processing

Database Processing and XML

Business Intelligence Systems

Web Database Processing Using Microsoft Access

Special Project – Introduction to Geographical Information Systems