

Computer Science 3311 – Database Management

Student Learning Outcomes

1. Fundamentals

Students will be introduced to fundamental concepts and techniques of relational database management. Database technology, why databases are used, and the components of a database system will be introduced.

2. The Relational Model

The relational model and key relational terminology will be presented as well as basic relational design principles.

3. Structured Query Language.

Structured Query Language, an international standard for creating and processing relational databases, will also be introduced.

4. Data Modeling and the Entity-Relationship Model

Students will become familiar with the database design process and will be introduced to the Entity-Relationship Model.

5. Database Design

Students will be able to transform a data model into a relational database design.

6. Database Administration

Students will learn about database management, and they will be introduced to many of the problems that occur when a database is concurrently processed by more than one user.

7. Database Processing Applications and Business Intelligence

Students will survey important advanced database concepts, including the use of databases to support web sites. Of particular interest will be an introduction to Geographical Information Systems using a spatial database software suite.

Course Content

Textbook: *Database Concepts*, 3rd 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