Relational Databases for IT

BT 333

Professor Winter Mason

Course Objectives:

To manage data in a business-critical way, it is important to understand the databases and the management systems, including appropriate design, implementation, and maintenance. Through this course, students will learn how to analyze an organization's data management needs and design, create, and manage a database to meet those needs.

List of Course Outcomes:

At the end of the course, students will be able to:

- Analyze a businesses data management needs
- Design a relational database to meet those needs
- Document the design with ER diagrams
- Use CASE tools for designing a database
- Understand Codd's rules for relational databases
- Correctly normalize a database
- Handle concurrent users of a database
- Create and use SQL databases

Prerequisites: Intro to programming (CS 105), IT & Communications (BT 121), and Applied Models and Simulation (BT 223)

Grading Percentages: HW: 50%; Class work: 25%; Final Project: 25%

Final project: Analyze a business's needs, determine requirements, define input & output, define entities and relationships, create ERD, write commands to create SQL dB, write queries for needed input & output.

Textbook(s) or References:

Relational Database Design and Implementation: Clearly Explained (3rd Ed.) by Jan L. Harrington

	Topic(s)	Reading(s)	HW
1/18	Introduction to the course & overview Obtaining MySQL		Obtain MySQL
1/23	Data Management Databases & DBMS	RDDI, Ch. 1	
1/25	Introduction to MySQL & YQL Importing & Exporting data	RDDI, Ch. 9	Create database, load data files, save as different formats
1/30	Data Types & Basic Functions	RDDI, Ch. 9	
2/1	Data Types & Basic Functions (cont.)		Write queries (no joins)
2/6	Entities and Relationships ER diagrams	RDDI, Ch. 3 & 4	
2/8	Entities and Relationships ER diagrams		Write ER diagram
2/13	Relational Data Model	RDDI, Ch. 5	
2/15	Relational Algebra		Relational Algebra
2/20	PRESIDENT'S DAY	NO CLASS	NO CLASS
2/22	Query logic & Joins		Write queries (joins)
2/27	Normalization	RDDI, Ch. 6	
2/29	Normal forms		Normalize a database
3/5	The importance of DB design DB structure & performance	RDDI, Ch. 7	
3/7	DB structure & performance Systems Analysis & Requirements	RDDI, Ch. 2	
3/12 **3/14**	SPRING BREAK SPRING BREAK	SPRING BREAK SPRING BREAK	SPRING BREAK SPRING BREAK
3/19	Review Systems Analysis & Requirements	RDDI, Ch. 2	
3/21	Case Study (Mighty mite)	RDDI, Ch. 11	FP: Find orgs to analyze
3/26	CASE tools	RDDI, Ch. 10	
3/28	CASE tools & Case study (SmartMart)	RDDI, Ch. 13	Generate docs with CASE
4/2	Codd's Rules	RDDI, Ch. 8	
4/4	Codd's Rules & SQL		Questions on Codd's Rules
4/9	Concurrency	RDDI, Ch. 14	
4/11	Concurrency		FP: Specify org's requirements
4/16	Database Security	RDDI, Ch. 15	
4/18	Database Security		FP: Create ERD
4/23	Generating reports & pivot tables		
4/25	Generating reports & pivot tables		Create reports for questions
4/30	Data Quality	RDDI, Ch. 17	
5/2	Review		Final Projects due