ISTM6202: Relational Databases
Weekly Topics and Homework Assignments

Weekly Topics

Most weeks will have readings from the text book, a lecture and a quiz. You should read the assigned readings and look over the lecture notes prior to class. Otherwise, the lecture might be difficult to keep up with. After the lecture, you will have until the beginning of the following week to take the quiz. The lecture notes and quiz are available on Blackboard.

**Topic 1: Introduction to Databases and Data Models: Relational and Dimensional**

Lecture: This lecture will provide an introduction to database concepts. It will show how database management systems evolved and where they are going. In addition, it will address the major distinctions between relational databases and data warehouses.

The syllabus and course requirements will also be covered.

Read Connolly and Begg Chapters 1 & 2

**Topic 2: The Relational Data Model**

Lecture: The concepts and terminology of the relational data model will be introduced. Integrity rules and their purpose will be explained.

Groups for the project will be formed.

Read Connolly and Begg Chapter 4

Demo: Creating Tables and Integrity Constraints

**Topic 3: Relational Languages**

Lecture: Relational Algebra operations will be discussed as a basis for SQL.

The group project will be introduced.

Read Connolly and Begg Chapter 5. You may skip the relational calculus.

**Topic 4: Introduction to SQL**

Lecture: Structured Query Language will be introduced and compared with traditional programming languages. Other query languages such as QBE will also be discussed.
Demo: Importing Data in MS Access; some simple SQL & QBE

Read Connolly and Begg Chapter 6 & 7

**Topic 5: Advanced SQL**

Lecture: Advanced features of SQL will be introduced. Missing information will be discussed.

Demo: Using Views and Advanced SQL for Data Analysis

Read Connolly and Begg Chapter 8

**Topic 6: Database Development Lifecycle**

Lecture: This lecture will discuss the database development lifecycle. Some heuristics and models for database design will be provided, and a case study will be presented. The group projects will also be discussed in more detail.

Read Connolly and Begg Chapter 10 & 16

**Topic 7: Midterm Examination**

Note: No make ups will be allowed unless approved two weeks in advance.

**Topic 8: E/R Modeling**

Lecture: The process of identifying, modeling and describing the information objects of interest will be discussed.

Read Connolly and Begg Chapters 12 & 13

**Topic 9: Normalization Theory**

Lecture: Normalization via Decomposition, Normalization via Synthesis and Armstrong’s Axioms will be discussed.

Read Connolly and Begg Chapters 14, 15 & 17

**Topic 10: Physical Design and Indexing**

Lecture: Access Methods, Indexing, and Storage Estimation will be discussed.

Read Connolly and Begg Chapter 18 and Appendix F
**Topic 11: Transaction Processing**

Lecture: The Database Transaction Model and problems in multi-user update management will be discussed along with record locking solutions.

See Connolly and Begg Chapter 22

**Topic 12: Data Warehousing and Big Data**

Lecture: The evolution of data warehousing concepts will be explored along with the controversy over data driven versus metric driven data warehouse design.

See Connolly and Begg Chapters 32, 33, & 34

**Topic 13: Group Dynamics in Database Design**

Lecture: We will discuss some of the dynamics that arose out of the group design project and will consider the impact of personality and values on the group experience.

**Topic 14: Group Project Presentations**

Students will present their group design projects. Evaluation criteria are posted on Blackboard.

**Topic 15: Final Examination**

* Note: The Final Examination will be given on the assigned date with no exceptions.


**Weekly Quizzes:** There will be 12 weekly quizzes on Blackboard. Each quiz will consist of five questions drawn from a pool derived from the lecture and chapter assignments for that week. You will have two opportunities to take the quiz, but, keep in mind that only your last attempt counts. The quizzes will be available from the end of class until the beginning of class the next week. You must take the quiz during those times. No exceptions will be made. Further, you will have 10 minutes to take the quiz so if you take it right before class, make sure you allow 10 minutes or Blackboard will not allow you start. For more details please read the Quiz Notes posted in Week 1 on Blackboard.

**Examinations:** There will be a midterm and a final examination. Each will have an objective component and a conceptual component. The objective component will be delivered by Blackboard similar to the quizzes. The quiz pools will be merged and 20 questions will be selected at random. You will have one hour to take each objective exam.
The same rules apply as for the quizzes. There will also be an in-class conceptual component given during the regular class time.

Note: If you have questions based on the quizzes, please ask them in class and I will be happy to answer them unless it does not appear that you have made any attempt to answer them yourselves. I cannot answer questions via email.

**Grading:** I always grade on a curve. Roughly half the class will receive A’s and half will receive B’s depending on the distribution and clustering of total scores for the semester which are computed according to the following weights.

- **Midterm:** 30% (Objective 10 points and Conceptual 20 points)
- **Final:** 30% (Objective 10 points and Conceptual 20 points)
- **Quizzes:** 20%
- **Project:** 20%