CSCI 297 – Database Systems
Fall 2014

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Office Hours: MWF 9:00 - 10:00
Thursday 1:00 - 3:00
or by appointment

Course Description

Databases are core components of many computing systems. This course introduces students to numerous theoretical and practical concepts surrounding database systems. We will focus on relational databases, relational algebra, SQL, and querying databases from within a programming environment.

Course Goals

Students who successfully complete this course will be able to:

- Construct database queries using SQL.
- Recognize the mathematical foundations of relational database systems.
- Write programs to interact with database systems.
- Interact with multiple different database systems.

Required Textbook

A First Course in Database Systems Third Edition by Jeffrey D. Ullman and Jennifer Widom.

Reading assignments will be given as we go. You are expected to complete the reading before class to facilitate class discussion.

Assignments, Quizzes, and Tests

Your grade will be calculated based on the following items:

- **Written Homework** – Written assignments will be given in order for you to explore the course content on your own in more detail. Generally assignments will be given during class and will be due at the beginning of the next class period.

- **Programming Assignments** – There will also be assignments through which you will explore how computer programs can interact with databases. These assignments should be turned in electronically through Google Drive. Please create a folder named with a string that contains your name and "CSCI 297" and share it with me. You may then make subfolders for assignments as they are assigned and upload files into the appropriate folders to turn them in.
- **Quizzes** – There will be a short quiz approximately every week. These quizzes will not be designed to be difficult, but rather to make sure the class is absorbing the key concepts.
- **Midterm Exam** – This will be an in class midterm exam.
- **Final Project** – There will be a final project in place of a final exam. This project will involve designing a database schema, populating the database with data from the real world, and creating an interface which presents the data in multiple ways. You are free to pick your own data source, but it must be approved by me. During our allotted final exam time period you will present your project to the class. More specific requirements for the project will be provided around the time of the midterm.

Grading

Grades will be weighted as follows:

25%	Written homework
25%	Programming assignments
5%	Quizzes
20%	Midterm exam
20%	Final project
5%	Final project presentation

I will use the standard 90, 80, 70, 60 grading scale with pluses and minuses. I may relax these standards as necessary but I will not raise them.

Course Policies

- **Late Policy** – Generally I expect assignments to be turned in on time. I understand that this is not always possible, so in most cases I will accept assignments one class session late without penalty. However, if this becomes a pattern it will start to affect your grade. To keep up the pace of the class, assignments will not be accepted after they are one session late unless there are special circumstances.
- **Extensions** – In certain circumstances granting an extension to an assignment's due date is perfectly reasonable. If you feel you need an extension, please contact me about it *before* the day it is due.
- **Absences** – You are expected to attend each class, but I understand that occasionally there will be exceptional circumstances. If you miss a class or know that you will miss an upcoming class, please contact me as soon as possible to explain the situation. You will still be expected to keep up with assignments and class content.

- **Academic Honesty** – You are encouraged to discuss and work with other students on homework assignments. However, the work you turn in should be your own. Help each other understand the concepts, but produce your own writing and code. See the Moravian College student handbook for more on the school-wide stance on academic honesty.
- **Disabilities** – Students who wish to request accommodations in this class for a disability should contact Elaine Mara, assistant director of learning services for academic and disability support in the lower level of Monocacy Hall, or by calling 610-861-1401. Accommodations cannot be provided until authorization is received from the Academic Support Center.

Communication

Always feel free to talk to me about any issues that may arise. Email is generally the fastest way to get in touch with me if you have a quick question. Though you are most likely to find me in my office during office hours, I will be around other times as well so don't be shy about stopping by.

Class-wide communication by email is important as well. I will set up a Google Group so that we can discuss things via email as a class.

Course Outline

- Introduction
- The Relational Model
  - Overview
  - A taste of SQL
  - Relational Algebra
- Design Theory for Relational Databases
  - Functional Dependencies
  - Schema Design
    - Decomposition
    - Normal Forms
- Query Languages
  - Datalog
  - SQL
- High-Level Database Models
  - Entity/Relationship Model
  - Unified Modeling Language
  - Object Definition Language
- Constraints

- Indexes
- Programming with SQL
- More topics as time permits

The details of this syllabus and schedule are subject to change based on our progress through the material.