

INF 385M: Database Management (27595)

Spring 2020
UTA 1.210A
Wednesday 9 am – 12 pm

Instructor: Jennifer Allen
jennifer.allen@utexas.edu

Office Hours: As requested. I work off-campus during the day but I will meet with students at any time that's convenient with 24 hours notice.

Course Description

The primary goal of this class is to learn principles and practices of database management and database design. Over the course of the semester we will discuss relational database design, normalization, SQL queries, reports and writing code to interface with databases. Additional lectures will cover ethical and privacy issues associated with database systems, as well as database security. In-class instruction and exercises will focus on the fundamentals for building and normalizing database structures, as well as creating sophisticated, interactive, and secure database applications. For the first weeks of lecture we will spend part of each evening studying the PHP programming language in order to better understand how data structures are stored and retrieved on computer systems, as well as laying the groundwork for a robust interface to accessing databases via the Web. We will then learn the fundamentals of database design using a variant of MySQL called MariaDB. MySQL and MariaDB are powerful relational database management systems used at companies such as Google and Facebook. We use PHP and MySQL as tools because they are commonly (and freely) available and provide substantially the same set of tools as commercial databases such as Microsoft SQL Server and Oracle. Although there will be a substantial programming (PHP) component to this course, previous programming experience is not required.

Course Objective

- Understand the fundamentals of how data is stored in computer systems.
- Know the fundamentals of Structured Query Language (SQL) and how it can be used to store and retrieve data from a relational database.
- Be able to apply the principles used in class to build a web-based database application from the ground up.

Course Schedule

Assignments

This schedule is flexible and subject to revision at any time.

Week	Assignment Due
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Jan 22	Create an iSchool account and send the name to instructor (we will do this in class)
Jan 29	Optional: In the Beginning was the Command Line
Feb 5	PHP Assignment #1
Feb 12	PHP Assignment #2
Feb 26	PHP Assignment #3
Mar 4	PHP Assignment #4
Mar 11	PHP Assignment #5
Apr 1 ????	Group Assignment ????
May 6	Final Project Presentations
May 13	Final Project Due

Lecture Order

This is general schedule of lecture topic order. *Because of the nature of this course most days there will be more than two topics covered and it will be subject to how quickly we move as a class; therefore this order is subject to revision.*

Course intro.

Linux, working at the command line

Securing your applications

Coding in PHP – Variables, creating forms

Coding in PHP – Math and control structures

Coding in PHP – Arrays

Coding in PHP – File Access

Sorting data

Databases – Normalization

Databases – Tables and relationships

Introduction to MySQL/MariaDB

Databases – SELECT Statements

Putting PHP and SQL together

Searching Databases

Refining searches

Course Requirements

Programming assignments (50% of final grade)

A series of short programming and database exercises designed to complement the hands-on work done in class. These exercises must be completed each week before the start of class. They will represent not only a demonstration of the students' grasp of concepts covered in the course, they will also provide a convenient code base from

which students can draw when designing their own projects. There will be 5 assignments worth 10 points each that will represent 50% of the final grade.

Group tutorial (10 % of final grade)

As an initial collaboration effort, each group of (3-5) students will develop and present an in-class tutorial on a database subject that will be assigned in class. Grades will be based on both the content of the tutorial and the presentation.

Final Project (40% of final grade)

The final project will also be done in groups of 3-5. For the final project, the groups will select or be presented with a real-world scenario for which a web application must be built. The project will incorporate database and programming concepts covered in class. Up to 20 points will be awarded based on the content and construction of the final project, 5 points will be awarded based on the in-class presentation, and 5 points will be based on group participants' member evaluations.

Required Course Readings

PHP for the Web (4th Edition)

Larry Ullman

Optional Course Reading

In the Beginning was the Command Line

Neal Stephenson

1999

This book is available as a paperback or can be downloaded from the files page as `command.txt`