

INF 385M: Database Management (28267)

Fall 2017
UTA 1.210B
Thursdays 6 pm – 9 pm

Instructor: Jennifer Allen
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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 four 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

This schedule is flexible and subject to revision.

Week	Lecture Topic	Assignment Due
Aug 31	Introduction/discussion of syllabus and class structure	Create an iSchool account and send the name to instructor (we will do this in class)

Sept 7	Linux, working at the command line Coding in PHP – Variables, creating forms	Read “Why the GUI Will Never Kill the Sacred Command Line?”, “PCs Before Windows: What Using MS-DOS Was Actually Like”, and “What is the Command Line?” Optional: In the Beginning was the Command Line
Sept 14	Coding in PHP – Math and control structures	PHP Assignment #1
Sept 21	Coding in PHP - Arrays	PHP Assignment #2
Sept 28	Coding in PHP – File Access Sorting data	PHP Assignment #3
Oct 5	Databases – Normalization Databases – Tables and relationships	PHP Assignment #4
Oct 12	Introduction to MySQL/MariaDB Databases – SELECT Statements	PHP Assignment #5
Oct 19	Putting PHP and SQL together	
Oct 25	Searching Databases	
Nov 2	JOIN types	Class tutorial
Nov 9	Refining searches	
Nov 16	Securing your database applications	
Nov 23	**Thanksgiving**	
Nov 30	OPEN (undecided)	
Dec 7	Final Presentations	

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

“Why the GUI Will Never Kill the Sacred Command Line?”

Caleb Garling

<https://www.wired.com/2012/07/command-line/>

“PCs Before Windows: What Using MS-DOS Was Actually Like”

Chris Hoffman

<https://www.howtogeek.com/188980/pcs-before-windows-what-using-ms-dos-was-actually-like/>

“What is the Command Line?”

(Sections: Overview, Ancient History, and What’s a Terminal?)

<https://learn.adafruit.com/what-is-the-command-line/ancient-history>

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`