Fall 9-1-2018

CSCI 240.01: Databases and SQL

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CSCI 240-Databases and SQL
T-Th 4:00-5:20, MC 026

Instructor: Daniel Lande
Office hours: By appointment
Email: daniel.lande@umontana.edu
Website: Moodle (http://umonline.umt.edu) & Piazza (https://piazza.com)

Textbook:

- Kroenke, D. and Auer, D. (2015). *Database Concepts (7th Edition)*. Pearson.

You may also find the following Web resources useful:

- http://dev.mysql.com/doc/refman/5.7/en/
- http://www.pearsonhighered.com/kroenke/

Course Description

Relational database design including: requirements analysis, data structure, entity relationships, normalization, relational algebra and integrity. Physical implementation focusing on data storage; retrieval and modification; concurrency; optimization; security; SQL; and XML.

Course Outcomes

Upon completing this course, a student will be able to:

- Design and create tables based on rules of normalization
- Create Entity Relationship Diagrams
- Utilize SQL effectively to create, query, and change a relational database
- Explain primary, secondary, and foreign keys
- Utilize the SQL join statement

Course Overview

Databases are an essential and ubiquitous part of everyday life, and many of our day-to-day tasks involve the use of an underlying database in some form or another. As future workers in the IT industry, it is critical that you understand fundamental concepts of databases and database management systems (DBMS), including how they are designed, implemented, queried, and maintained. Individuals with skills working with databases are in high-demand. This class is your chance to gain these skills.

In industry, there has been a movement towards the use of virtualized servers and cloud-based environments. In this class, you will work in a similar environment through an online platform called Cloud9. Cloud9 uses Docker (https://www.docker.com/) to virtualize an instance of the Linux Ubuntu operating system on which we will run MySQL to explore the outcomes listed above. Through a final project developed using MySQL and a programming environment TBD, we will explore how databases work in conjunction with web-based applications to provide the online experience that is ubiquitous in today's world. Students will design a database from the conceptual phase, create an ER diagram to model their system, perform normalization, create the database in MySQL, build necessary SQL queries,

and finally use a server-side language to bring everything together through simple web-pages that allow interaction with the created database.

Prerequisites

The prerequisites for this class are CSCI 172 or consent of instructor.

Software

We will work with the cloud-based IDE Cloud9, the open-source database MySQL, and the server-side programming language TBD. MySQL and the server-side language will be setup on Cloud9, so no software will be required to be installed on your machine. Details will follow for how to setup your Cloud9 account.

Evaluation & Grading

Your grade for the course will be based on:

40%	Homework Assignments
40%	Quizzes and Exams
20%	Final Project

Final Exam

The scheduled final exam is Thursday, December 13, 2018, 3:20 pm – 5:20 pm. I am unable to offer alternate dates for the final exam, so please mark your calendar now!

Late Assignment Policy

- All quizzes, exams, and programming assignment are to be completed on the assigned date and time. Late assignments will be NOT be accepted without appropriate justification and only at the discretion of the instructor. Rescheduling of a quiz or exam will be approved at the discretion of the instructor and only in extraordinary situations.

Additional class policies and information:

- If you miss a class, you and you alone are responsible for the material covered. This includes handouts, schedule changes, and lecture notes. Do not expect me to reiterate a class period that you missed. I'll try to keep Moodle updated with PowerPoint slides and materials from class.
- All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://www.umt.edu/vpesa/Dean%20of%20Students/default.php.
- Key dates for various autumn term activities/deadlines, including adding and dropping a course, can be accessed at: http://www.umt.edu/provost/academiccalendar/

- University Policy for dropping courses or requesting grading/credit status changes can be found in the catalog: https://www.umt.edu/registrar/students/dropadd.php. Students should become familiar with all academic policies
- Students with disabilities will receive reasonable modifications in this course. Your responsibilities are to request them from me with sufficient advance notice and to be prepared to provide verification of disability and its impact from Disability Services for Students. Please speak with me after class or during my office hours to discuss the details. For more information, visit the Disability Services for Students website at http://www.umt.edu/dss/.
- Note: Instructor reserves the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances. If changes are made to the syllabus, amended copies will be dated and made available to the class.

Questions? Email daniel.lande@umontana.edu

The following schedule is subject to change!

Week #	Text Reading	Tuesday	Thursday
1	Ch. 1	*8/28* Getting started with Databases	*8/30* Getting started with Databases
2	Ch. 2	*9/4* The Relational Model	*9/6* The Relational Model
3	Ch. 2	*9/11* The Relational Model	*9/13* The Relational Model
4	Ch. 3	*9/18* Structured Query Language	*9/20* Structured Query Language
5	Ch. 3	*9/25* SQL & Database Design	*9/27* SQL & Database Design
6	Ch. 4	*10/2* **Exam 1**	*10/4* Data Modeling and ER Model
7	Ch. 4	*10/9* Data Modeling and ER Model	*10/11* Data Modeling and ER Model
8	Ch. 5	*10/16* Database Design	*10/18* Database Design
9	Ch. 5	*10/23* Database Design	*10/25* Database Design

10	Ch. 5	*10/30* More SQL	*11/1* **Exam 2**
11	TBA	*11/6* No Class! Election Day	*11/8* Server-Side Programming
12	TBA	*11/13* Server-Side Programming	*11/15* Project
13	TBA	*11/20* Project	*11/22* No class! Thanksgiving
14	TBA	*11/27* Additional Topics	*11/29* Additional Topics
15	Ch. 6 & 8	*12/4* Chapter 6 Highlights	*12/6* Chapter 8 Highlights
16	Finals Week	Finals Week	*12/6* Final Exam 3:20 pm – 5:20 pm

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