SYLLABUS

CSCI 3287-002: Design and Analysis of Data Systems

Course Information

Semester: Fall 2020
Credit: 3
Dates: Aug 24, 2020 – Dec 7, 2020
Class Meetings: Tue & Thu: 5:30 pm – 6:45 pm, Remote Zoom

Instructor Information

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Office Hours: By appointment only

Grader Information

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Course Information

This course introduces the fundamental concepts of database requirements analysis, database design, and database implementation with emphasis on **the relational model and the SQL programming language.**

Topics for the course include

- The Relational Model
- SQL (Structured Query Language)
- Database design using normalization with data modeling using entity relationship diagrams
- DBMS software fundamentals including security, logging, backup/recovery, transaction processing, concurrency & locking
- Business Intelligence (BI) and Data Warehousing
- The role of the DBA (database administrator) and careers in "data"
- Database server architecture and managing query and DBMS software performance
- Big data conceptual introduction

This is a **technical, "hands-on" course** in the design, creation and manipulation of relational databases using MySQL relational database management software. There are no separate recitations/labs, so the "hands on" work will be accomplished through homework assignments.

Textbooks and Materials

Reading Materials:

Database Systems: The Complete Book, 2nd Edition, Garcia-Molina, H., Ullman, J. D., and Widom, J. ISBN 978-0131873254.

The Data Warehouse Toolkit: The Complete Guide to Dimensional Modeling, 2nd Edition, Ralph Kimball and Margy Ross Wiley Computer Publishing ISBN 0-471-20024-7.

Lecture slides will be available in Canvas, as needed. Majority of slides are courtesy of **Mr. Alan Paradise**

Software Installations

You will need to install some software applications / tools for a technical, "hands-on" practice. Installation instructions and guidance will be provided during the course, as needed.

- MySQL workbench for Data Modelling and Query tools.
- QlikView for BI application software (this is windows based BI application, VM installation needed to run windows on Unix/Linux or Mac OS).

Course Outcomes

- Define, describe, and explain fundamental database concepts
- Demonstrate understanding of the relational model for database design
- Exhibit ability to document relational database requirements and design using data models depicted in entity relationship diagrams
- Design databases normalized to third normal form
- Create, query, and manipulate relational databases using SQL (structured query language)
- Understand and describe the concept of Business Intelligence
- Exhibit understanding of the Data Warehouse and how Data Warehouse design differs from transactional database systems.
- Comprehend and describe the role of the DBA (database administrator)

- Understand the fundamental processes of relational DBMS software in terms of transaction processing, logging, backup/recovery, concurrency & locking
- Grasp the concepts of BigData as recent industry trends in data systems

Course Website

We will be using **Canvas** for all necessary information and materials regarding each week's class:

- Lecture slides
- Reading assignments
- Homework assignments
- Project assignments
- Assignment submission
- Mid-term and Final Exam
- Grades

Grading

Component	% Points
Assignment 1 – Normalization	10
Assignment 2 – Data Modeling	10
Assignment 3 – DDL_DML	10
Assignment 4 – SQL Scripts	15
Assignment 5 – Data Warehouse	15
Assignment 6 - QV BI Dashboard	10
Exams	
Mid-Term Exam	15
Final Exam	15
TOTAL	**100**

Late Submissions

You will receive a **two days extension** on homework assignment for a **20% grade penalty**. After two days late submission extension, your assignment is considered past due and will not be accepted.

In the event of a documented personal, family, or medical emergency, consult your instructor about receiving a penalty free extension.

Attendance

In general, attendance at lectures is not graded per se, but is highly recommended. You are responsible for knowing the material presented during lectures, even if you are not in attendance when the material was presented.

Syllabus Changes

The instructor reserves the right to modify this syllabus as needed during the semester. Should any changes be necessary, the instructor will inform students of the change and post and updated copy of the syllabus into the Canvas.

Syllabus Statements

The current required syllabus statements found here:

https://www.colorado.edu/academicaffairs/policies-customs-guidelines/required-syllabus-statements