DAMG 6210 – Data Management and Database Design – Fall 2024

Instructor: Yusuf Ozbek <y.ozbek@northeastern.edu>

Description:
This course is designed to teach the basics of databases, as well as techniques to design and build efficient databases and query them to extract useful information, and to teach the essentials of databases from ground up. Real life examples are provided to help students avoid common database design mistakes. Through the help of use cases and class diagrams modeled in the UML, students will learn how to discover and represent the details and scope of the problem in question.

Outcomes:
Students are expected to learn

- Basic concepts of relational database modeling
- The components of a relational database model
- Making normalization easier to use
- Describing tables during using analysis
- Refining tables and relationships using design
- How to identify database requirements that meet users' needs
- How to read and write data with SQL
- Create relational database models by applying business rules
- How to build data models using a variety of modeling techniques
- How to refine and tune the design to improve database performance
- Understand the relationship between good application design and database design
- Design flexible and robust databases that can adapt to business change and growth
- Ways to design for ease of maintenance and support
- How to avoid common database design mistakes

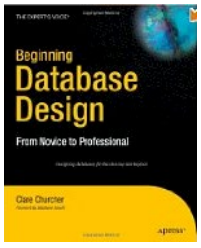
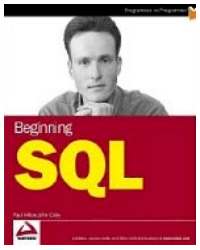
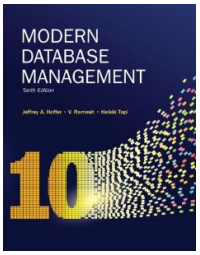
Prerequisites:

- No prior database experience is required
- Comfort with computers, desktop tools and general computing concepts are expected
- Prior programming while not required is helpful

Textbooks:

- There are no required textbooks for this course. All reading assignments will be provided through course notes, web articles, and a number of free online texts.
- Assigned and supplementary reading materials are freely available to NEU students via the Safari Books Online.

References:

Database Design ISBN: 1590597699	Database Design Sol. ISBN: 0470385499	Beginning SQL ISBN: 0764577328	High Performance MySQL ISBN: 1449314287	Modern Database Mgmnt ISBN: 0136088392
				

Grading Policy:
Assignments: 10%
Midterms (2 exams): 20-30%
Final Project: 20-30%
Final Exam: 20-30%

Exam and Project Dates: TBA

Attendance Policy:
Attendance is required. Students are responsible for any material covered in class. Lots of the materials covered in class will not be in the textbook. Announcements about homework, projects, programming assignments, etc. may be made in class or online or by emails.

Tools used:
- MySQL
- Microsoft SQL Server
- Oracle
- JDBC

Course Topics:
- Database Design
- Goals of Effective Database Design
- Relational Database Fundamentals
- Understanding User Needs, and Translating User Needs Into Data Models
- Extracting Business Rules
- Normalizing Data
- Designing Databases to Support Software Applications
- Common Design Patterns and Common Design Pitfalls
- SQL
- SQL Syntax and SELECT
- Creating and Modifying Databases and Tables
- Data Constraints
- Relating Tables
- Creating New Records, Deleting and Updating Records
- SQL Functions Date, Time, and Strings
- SQL Functions - Math and Data Type Conversion
- Grouping - Using Aggregate Functions
- Stored Procedures
- Views and Indexes

Case Studies:
- Creating a Database and its Schema
- Northwind Online Product Catalog

Policy on Academic Dishonesty:
Occurrences of academic dishonesty, such as copying and the submission of work that is not the student's own, will be dealt with according to the NEU's and COE's policies on academic dishonesty. In addition, students who allow their files or assignments to be copied are as guilty of academic dishonesty as those who copy and will be treated accordingly. Each student is responsible for taking reasonable precautions to ensure that his/her work is not available for unauthorized use. Students stealing or passing off class work as one's own will fail the class, and risk suspension from the MSIS program. Essential to the mission of Northeastern University is the commitment to the principles of intellectual honesty and integrity. Academic integrity is important for two reasons. First, independent and original school work ensures that students derive the most from their educational experience and the pursuit of knowledge. Second, academic dishonesty violates the most fundamental values of an intellectual community and depreciates the achievements of the entire University community. It is extremely important that the student understand that Northeastern University views academic dishonesty as one of the most serious offenses that a student can commit while in college. It is the student's responsibility to know and follow these standards/codes of ethics, which are part of the student's academic program.

Please take the time to read what constitutes dishonesty and what the University is willing to do to respond to such incidents: http://www.northeastern.edu/osccr/academichonesty.htm