Northeastern
College of Engineering

DAMG 6210: Data Management and Database Design

Course Information
Course Title: Data Management and Database Design
Course Number:DAMG 6210
Term and Year: Fall 2024
Credit Hour: 4
CRN: 21531
Course Format: On-Ground

Instructor Information
Full Name: Dr. Rafiuzzaman Mohammad
Email Address: r.mohammad@northeastern.edu
Office Hours: To be provided during the course

Instructor Biography
Dr. Rafiuzzaman Mohammad is a seasoned professional with extensive experience in academia, research, and industry. He is a tenure-track faculty member at the British Columbia Institute of Technology (BCIT), specializing in software development, applied machine learning, system design, and IoT technologies. Dr. Rafiuzzaman holds a Ph.D. in Electrical and Computer Engineering from the University of British Columbia (UBC) under the prestigious International Doctoral Fellowship (IDF). In industry, he has led teams as a Project Manager and Lead Android Developer, developing innovative solutions in digital marketing, IoT, and enterprise resource planning systems.

Teaching Assistant Information
Full Name: Click or tap here to enter text.
Email Address:Click or tap here to enter text.
Office Hours:Click or tap here to enter text.

Course Prerequisites
No prerequisites are required for this course.

Course Description
This course covers relational and NoSQL database technologies, including basic concepts, relational algebra, enhanced entity-relationship and NoSQL data modeling, functional dependencies and normalization, design methodology, SQL query language (DDL and DML), views, security and transaction management.

Course Learning Outcomes

1) Understand Data Modeling Principles: Students will be proficient in data modeling techniques, including entity-relationship (E-R) and object-oriented approaches, to design effective information systems for engineering and business applications.
2) Master Relational Database Concepts: Students will gain a comprehensive understanding of fundamental concepts of relational database management systems (DBMS), relational algebra, SQL, and data normalization; and be able to apply these concepts to design and implement relational databases.
3) Design Data-Driven Applications: Students will be equipped with the skills to design data-driven applications tailored to various computing environments, including personal computer, server-based, and Internet databases.

Required Tools and Course Textbooks.
Textbook: DATABASE SYSTEMS DESIGN, IMPLEMENTATION, AND MANAGEMENT (13th Edition) by Carlos Coronel, Steven Morris, Cengage Learning, 2018.
ISBN-10: 1337627909
ISBN-13: 978-1337627900

Course Schedule/Topics Covered.

Week	Date	In Class Topic	Reading	Assignment Due
1	09/04	**Labour Day**		
2	09/11	**Introduction to Database Systems**	**Ch 1, 2**	**In class**
3	09/18	**Relational Model**	**Ch 2, 3**	**In class**
4	09/25	**Database Design – Conceptual Design 1**	**Ch 4, 9**	**In class**
5	10/2	**Database Design – Conceptual Design 2**	**Ch 5, 9**	**In class**
6	10/9	**Normalization**	**Ch 6, 9**	**In class**
7	10/16	**Logical & Physical Database Design (SQL) 1**	**Ch 7, 9**	**In class**
8	10/23	**Physical Database Design - Structure Query Language (SQL) 2**	**Ch 7**	**In class**
9	10/30	**Midterm Exam**		
10	11/6	**Physical Database Design - Structure Query Language (SQL) 3**	**Ch 7**	**In class**
11	11/13	**Tuning Physical Design - Advanced SQL**	**Ch 8, 11**	**In class**
12	11/20	**Tuning Physical Design - Embedding SQL in program code**	**Ch 8**	**In class**
13	11/27	**Databases for Business Intelligence**	**Ch 13**	**In class**
14	12/4	**Non-Relational Databases**	**Ch 14**	**In class**
15	12/11	**Revision**		

16	12/18	Final Exam		

Assignment Grading
- Labs – 20%
- Assignment 1 – 15%
- Assignment 2 – 15%
- Test 1 – 05%
- Test 2 – 05 %
- Midterm Exam – 20%
- Final Exam – 20%

Grading Scale

	87-89.9% B+	77-79.9% C+	
	84-86.9% B	74-76.9% C	
95-100% A			
90-94.9% A-	80-83.9%B-	70-73.9% C-	
			69.9% or below F

Attendance/Late Work Policy

Attendance Policy

Students registered in MGEN courses (INFO, CSYE, and DAMG) are allowed **a maximum of 2 absences per course, with 3 or more absences resulting in an automatic 'F' for that course.** Students are expected to inform their instructors of any absences in advance of the class; if a student is sick long-term or experiences a medical issue that prevents class attendance, it is strongly encouraged that they speak with their Academic Advisor (coe-mgen-gradadvising@northeastern.edu) to learn more about the Medical Leave of Absence. Should a student anticipate being unable to attend 3 or more classes, they should discuss their situation with their Academic Advisor to explore other types of leave in accordance with the University's academic and global entry expectations. International students should review the Office of Global Services webpage to understand their visa compliance requirements.

Teaching Assistants (TAs) or Instructional Assistants (IAs) will be present at each class to collect student attendance.

Late Work Policy

Students must submit assignments by the deadline in the time zone noted in the syllabus. Students must communicate with the faculty prior to the deadline if they anticipate work will be submitted late. Work submitted late without prior communication with faculty will not be graded.

End-of-Course Evaluation Surveys
Your feedback regarding your educational experience in this class is particularly important to the College of Engineering. Your comments will make a difference in the future planning and presentation of our curriculum.

At the end of this course, please take the time to complete the evaluation survey at **https://neu.evaluationkit.com**. Your survey responses are **completely anonymous and confidential**. For courses 6 weeks in length or shorter, surveys will be open one week prior to the end of the courses; for courses greater than 6 weeks in length, surveys will be open for two weeks. An email will be sent to your Northeastern University Mail account notifying you when surveys are available.

Academic Integrity
A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

Go to http://www.northeastern.edu/osccr/academic-integrity-policy/ to access the full academic integrity policy.

MGEN Student Feedback
Students who would like to provide the MGEN unit with anonymous feedback on this particular course, Teaching Assistants, Instructional Assistants, professors, or to provide general feedback regarding their program, may do so using this survey: https://neu.co1.qualtrics.com/jfe/form/SV_cTlAbH7ZRaaw0Ki

University Health and Counseling Services
As a student enrolled in this course, you are fully responsible for assignments, work, and course materials as outlined in this syllabus and in the classroom. Over the course of the semester if you experience any health issues, please contact UHCS.

For more information, visit https://www.northeastern.edu/uhcs.

Student Accommodations
Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the activities of the university. To receive accommodations through the DRC, students must provide appropriate documentation that demonstrates a current substantially limiting disability.

For more information, visit https://drc.sites.northeastern.edu.

Library Services
The Northeastern University Library is at the hub of campus intellectual life. Resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.

For more information and for education specific resources, visit https://library.northeastern.edu
Network Campus Library Services: Northeastern University Library Global Campus Portals

24/7 Canvas Technical Help
For immediate technical support for Canvas, call 617-373-4357 or email help@northeastern.edu

Canvas Student Resources: https://canvas.northeastern.edu/student-resources/

For assistance with my Northeastern e-mail, and basic technical support:
Visit ITS at https://its.northeastern.edu
Email: help@northeastern.edu
ITS Customer Service Desk: 617-373-4357

Diversity and Inclusion
Northeastern University is committed to equal opportunity, affirmative action, diversity, and social justice while building a climate of inclusion on and beyond campus. In the classroom, members of the University community work to cultivate an inclusive environment that denounces discrimination through innovation, collaboration, and an awareness of global perspectives on social justice.

Please visit http://www.northeastern.edu/oidi/ for complete information on Diversity and Inclusion

Title IX
Title IX of the Education Amendments of 1972 protects individuals from sex or gender-based discrimination, including discrimination based on gender-identity, in educational programs and activities that receive federal financial assistance.

Northeastern's Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty, and staff.

In case of an emergency, please call 911.

*Please visit **https://www.northeastern.edu/ouec** for a complete list of reporting options and resources both on- and off-campus.*