

Database Design & Implementation for Business

MET CS 669 / MET CS 469

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Office Hours: Available by appointment and as needed.

Course Description

Students explore the latest relational and object-relational tools and techniques for managing persistent data and object modeling. They gain extensive hands-on experience with leading database systems such as Oracle, SQL Server, or PostgreSQL while mastering Structured Query Language (SQL). As part of their learning journey, students will design and implement a comprehensive database system for their term project.

Course Objectives

- Introduce students to relational database management systems and design principles.
- Understand the role of Structured Query Language (SQL) in interacting with relational databases.
- Discuss essential database design considerations, including concurrency and transaction management.
- Explore the processing of database queries and strategies for optimization.
- Examine how databases are evolving to address modern technical challenges, such as advanced analytics.

Books: *Recommended, not required*

Coronel, C.M., Morris, S. Database Systems Design 14th Edition Cengage.

ISBN: 978-0357673034

Courseware

Course Site on Blackboard

- <https://onlinecampus.bu.edu> or <https://learn.bu.edu>

Software

- DBMS (Free version of Oracle, SQL Server, or PostgreSQL)
- DB Client (DBeaver, and other open source tool)
- ERD Modeling (LucidChart, or any other modeling tool)

Class Policies

- 1) **Attendance & Absences** – Attendance is not required but strongly encouraged, especially since class participation is part of the course grading criteria. If a student misses a class, it is their responsibility to catch up with the material discussed during the missed class.
- 2) **Assignment Completion & Late Work** – Assignments to be submitted in Blackboard as a .doc file with the following naming convention: *LastnameFirstName_Assignment1.docx*.
- 3) **Gen AI Tools Usage:** The use of ChatGPT and other generative AI tools is strictly prohibited. Engaging with such tools may result in severe consequences.
- 4) **Penalties for Late Work** - Please make all efforts to turn in assignments in a timely manner. See the following penalties for late submissions.

Homework Assignments -

- 10% deduction if submitted within 5 days after assignment deadline
- 50% deduction if submitted within 6 to 14 days after assignment deadline
- No assignments accepted after 14 days of assignment deadline

Term Project -

- 10% deduction **per day** submitted after project deadline
- 100% deduction if submitted 7 days after project deadline

We recognize that emergencies occur in professional and personal lives. If one occurs that prevents your completion of work by a deadline, please work with your professor via email as soon as possible. This must be done in advance of the deadline unless the emergency makes this impossible and should be accompanied by particulars that back it up. Additional documentation may be requested.

- 5) **Academic Conduct Code** - Cheating and plagiarism are strictly prohibited. Engaging in such activities will result in a loss of credit for the affected assignment or examination and may lead to disciplinary actions. We encourage you to take the time to review the Student Academic Conduct Code for further details:

http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html. This should not be understood as a discouragement for discussing the material or your particular approach to a problem with other students in the class. On the contrary – you should share your thoughts, questions and solutions. Naturally, if you choose to work in a group, you will be expected to come up with more than one and highly original solutions.

Grading Criteria

Category	Final Grade Weight (%)
Class Participation & Attendance	10%
Assignment / Lab	25%
Term Project	25%
Midterm Exam	20%
Final Exam	20%

Grade Numeric	Grade Range	Grade Points
A	≥ 95	4.0
A-	$\geq 90 < 95$	3.7
B+	$\geq 87 < 90$	3.3
B	$\geq 83 < 87$	3.0
B-	$\geq 80 < 83$	2.7
C+	$\geq 77 < 80$	2.3
C	$\geq 73 < 77$	2.0
C-	$\geq 70 < 73$	1.7
D	$\geq 60 < 70$	1.0
F	< 60	0

Lectures, Readings, and Assignments/Labs:

Lectures, Readings, and Assignments (Lab and Project) are subject to change, and will be announced in class as applicable within a reasonable time frame.

Date	Lecture Topic	Assignments / Labs Due	Term Project Due
May 20	Intro to Databases and SQL		
May 27	Data Modeling	Assignment Lab 1	
Jun 3	Relational Model & ERD Part I		Term Project Update #1
Jun 10	ERD Part II	Assignment Lab 2	
Jun 17	Normalization Part I		Term Project Update #2
Jun 24	Aggregating Data	Assignment Lab 3	
Jul 1	Midterm Exam		
Jul 1	Normalization Part II		Term Project Update #3
Jul 8	Database Programming	Assignment Lab 4	
Jul 15	Transaction Management		Term Project Update #4
Jul 22	Performance Tuning	Assignment Lab 5	
Jul 29	Distributed Databases		Term Project Update #5
Jul 29	Advanced Database Topics Part I		Term Project Update #6
Jul 29	Advanced Database Topics Part II		Final Term Project Due
Aug 5	Final Exam		