Boston University Metropolitan College

Database Management

CS579
Learn from Anywhere Course Format, Offered Remotely
Wednesdays 6:00PM –9:30PM

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      Slack: You will be sent an invitation to join the class Slack channel

Course Description

This course provides a theoretical yet modern presentation of database topics ranging from Data and Object Modeling, relational algebra and normalization to advanced topics such as how to develop Web-based database applications. Other topics covered - relational data model, SQL and manipulating relational data; applications programming for relational databases; physical characteristics of databases; achieving performance and reliability with database systems; object- oriented database systems. Prereq: MET CS 231 or MET CS 232; or instructor's consent.

Course Objectives

The goal of this course is to study basic concepts of database systems with emphasis on relational databases. The topics include:

- Entity-relationship model
- Relational data model
- SQL DML and DDL
- Relational algebra
- Database design for relational databases
- Functional dependencies and normalization
- Indexes, stored procedures, and triggers
- Introductory topics:
    - Introduction to query processing and transaction management
    - Survey of NoSQL databases
- Other topics, if time allows

Books

Hoffer, Modern Database Management 13th Edition
Pearson 2019 ISBN: 9780134773650
Available for rent from the BU Bookstore

J. Russo, SQL By Example, 2018, Momentum Press
ISBN:9781945612626
Available from the BU Bookstore

Courseware
All course material will be on Blackboard. http://learn.bu.edu
We will use Lucidcharts (www.lucidchart.com) for drawing
An Oracle image will be available to run on Virtual Box (www.virtualbox.org)

Class Policies
1) **Recording Policy:** Since all classes will be conducted remotely via Zoom, they will be recorded and available only in Blackboard with a password.
2) **Attendance & Absences:** Attendance is not required but strongly encouraged. If a student misses a class it is his/her responsibility to catch up with the material discussed during the missed class.
3) **Assignment Completion & Late Work**
   Assignment Submission
     Homework and Exams
       All homework assignments as well as exams must be submitted via Blackboard. Please name the file with the assignment and your name. For example, homework1JaneDoe.pdf. You can submit a PDF or Word document. For SQL assignments, please do not submit screenshots of individual queries.
     Project Submissions
       All project deliverables must be submitted by only one member of the group. Once the groups are established in Blackboard, grading will be done once and the entire group will receive the grade. Please submit either a PDF or Word document, name it the deliverable and name of the team. For example: proposalTeam1.pdf

4) **Academic Conduct Code** –Cheating and plagiarism will not be tolerated in any Metropolitan College course. They will result in no credit for the assignment or examination and may lead to disciplinary actions. Please take the time to review the Student Academic Conduct Code:

   http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html.

   NOTE: [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 rather than the same mistakes.]

Bear in mind that project work can be done in teams. However, all other work (homework and exams) must be done individually. Turning an assignment in as a group will be considered cheating.

Grading Criteria

- Midterm: 25%, Final: 25%
- Homework: 15%
- Class Project: 35%

Letter Grade

$90 \leq G < 94$: A- $94 \leq G$:   A,
$80 \leq G < 83$: B- $83 \leq G < 87$: B $87 \leq G < 90$: B+
$70 \leq G < 73$: C- $73 \leq G < 77$: C $77 \leq G < 80$: C+
$60 \leq G < 70$: D $G <$
60: F

Assignment

- There will be five homework assignments (the number of assignments may vary according to the actual progress of the class).
- Solutions will be discussed in the class when graded papers are returned.

Class Project

This is a design and implementation of a database. The project follows a typical database design process and consists of four parts. Details will be discussed in the class. You will be expected to present your project to the entire class. You can work on a team of 2-3 students.

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Class Meetings, Lectures & Assignments

Week	Date	Lecture	Reading Assignment (book chapters)	Project Assignment
1	5/26	Basic Concepts, Conceptual Design with ERD	Hoffer Chapters 1 and 2	
2	6/2	EERD, Relational Data Model	Hoffer Chapters 3 and 4	Part 1
3	6/9	Logical Design	Hoffer Chapter 4	
4	6/16	Normalization, Relational Algebra	Handout, Hoffer Chapter 4	Part 2
5	6/23	Relational Algebra, SQL	Handout, Russo 1,2, Hoffer Chpt 6	
6	6/30	SQL	Russo 3,4, Hoffer Chpt 6	Part 3
7	7/7	SQL Wrap-up Physical Design	Russo 5-7, Hoffer Chpt 7	
8	7/14	Physical Design, Indexes Query Design	Hoffer Chpt 5	
9	7/21	Stored Procedures and Triggers	Handout	
10	7/28	Intro to query processing, Intro to transaction management Survey of NoSQL		Part 4
11	8/4	Data Warehousing Big Data	Handout, Hoffer Chpt 9	
12	8/11	Project Presentations		