Database Management
CS579
Learn from Anywhere Course Format, Offered Simultaneously On Campus and Remote
On Campus Meeting Location: CAS B27
Monday 6:00PM – 8:45PM

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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)

Spring 2020 COVID-19 Policies

Classroom Rotations: Classrooms on campus have new capacities that follow guidelines issued by state and local health and government authorities related to COVID-19 and physical distancing. Before the beginning of the class, and throughout the semester, I will be reaching out to students who have indicated that they want to attend the classroom in-person. Our classroom hold [] students, and therefore we will have [two] rotations of students that come to class on campus alternate weeks. You will be asked to attend remotely on the week that you have rotated out the classroom.

Compliance: All students returning to campus will be required, through a digital agreement, to commit to a set of Health Commitments and Expectations including face coverings, symptom attestation, testing, contact tracing, quarantine, and isolation. The agreement makes clear that compliance is a condition of being a member of our on-campus community.

You have a critical role to play in minimizing transmission of COVID-19 within the University community, so the University is requiring that you make your own health and safety commitments. Additionally, if you will be attending this class in person, you will be asked to show your Healthway badge on your mobile device to the instructor in the classroom prior to starting class, and wear your face mask over your mouth and nose at all times. If you do not comply with these rules you will be asked to leave the classroom. If you refuse to leave the class, the instructor will inform the class that they will not proceed with instruction until you leave the room. If you still refuse to leave the room, the instructor will dismiss the class and will contact the academic Dean's office for follow up.

Boston University is committed to offering the best learning environment for you, but to succeed, we need your help. We all must be responsible and respectful. If you do not want to follow these guidelines, you must participate in class remotely, so that you do not put your classmates or others at undue risk. We are counting on all members of our community to be

courteous and collegial, whether they are with classmates and colleagues on campus, in the classroom, or engaging with us remotely, as we work together this fall semester.

Class Policies

1) **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.

2) **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

3) **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.

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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	1/25	Basic concepts	Hoffer Chpt 1	
2	1/31	Conceptual design with ER	Hoffer Chpt 2	
3	2/8	EER, Relational data model	Hoffer Chpt 3	Part 1
4	2/16	Logical design *Note: Tuesday class in place of Monday due to holiday*	Hoffer Chpt 4	
5	2/22	Normalization	Hoffer Chpt 4	Part 2
6	3/1	SQL	Hoffer Chpt 6 Russo 3,4	
7	3/8	SQL	Hoffer Chpt 7 Russo 5	
8	3/15	Midterm (online), SQL	Hoffer Chpt 7 Russo 6,7	
9	3/22	Relational algebra, SQL		Part3
10	3/29	Physical Design	Hoffer Chpt 5	
11	4/5	Stored procedures and triggers	Handout	Part 4
12	4/12	Intro to query processing, Intro to transaction management Concurrency	Hoffer Chpt. 8	

13	4/21	Backup and Recovery. Database Administration NoSQL *Note: Wednesday class because of holiday*	Hoffer Chpt. 8	
14	4/26	Project Presentations		
15	5/3	Final Exam (online)		