Database Design and Implementation for Business
CS669
Thursday 6:00pm -8:45pm CAS 226

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     Slack: You will receive an invitation to join.

Course Description

Students learn the latest relational and object-relational tools and techniques for persistent data and object modeling and management. Students gain extensive hands-on experience using Oracle or Microsoft SQL Server as they learn the Structured Query Language (SQL) and design and implement databases. Students design and implement a database system as a term project. Restrictions: This course may not be taken in conjunction with MET CS 469 (undergraduate) or MET CS 579. Only one of these courses can be counted towards degree requirements.

Course Objectives

- Introduce students to relational database management systems and design
- Discuss SQL, how to create and query tables
- Introduce stored procedures, stored functions and triggers
- Discuss concurrency and transaction management
- Explain how queries are processed and can be optimized

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Books

Coronel, C.M., Morris, S. <u>Database Systems Design 13th Edition</u> Cengage.
ISBN: 978-1337627900   You can also use the 12th edition

J. Russo, SQL By Example, 2018, Momentum Press
ISBN: 9781945612626

Courseware
All course material will be on Blackboard. http://onlinecampus.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)
You can also use Visio.

BU Community COVID-19 Public Health Policies

All students returning to campus will be required to be vaccinated against COVID-19, and upload information about their status (including applications for a medical or religious exemption or an extension) to the Patient Connect portal. In addition to the vaccine requirement, students must follow all other safety protocols, including the face covering policy, and screening, contact tracing, and testing requirements. At the beginning of each class you will be asked to show a green Healthway compliance badge on your mobile device to the instructor, and wear your face mask over your mouth and nose at all times.

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 Project Submissions
   All homework assignments as well as quizzes. Exams and project deliverables must be submitted via Blackboard. In the case of an assignment or project deliverable, 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.

   Policy on Late Homework and Project Deliverables
   Turning homework in late does not help either of us. It has been my experience that students get further behind when trying to catchup. Therefore, my policy is to

deduct 10 points as a penalty for each week that an assignment or project deliverable is late up to three weeks. After three weeks, the assignment or deliverable cannot be submitted.

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.

Grading Criteria

Weekly Quizzes	25%
Graded Homework	15%
Final Exam	20%
Term Project	30%
Class Participation	10%

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 are graded homework assignments, again usually one every two weeks or so. These reinforce the concepts of the lecture on database concepts. These also should be submitted on Blackboard. I have scheduled these so that they you can work on the homework during the week, bring your questions to ask before or after class and then submit the following weekend.

Class Project

There is a required project. The deliverables for the project are designed to dovetail with what you have learned in class. There will be a final project report due during the last week of class.

Quizzes

There are a series of quizzes, usually every other week. These will be due during the following week. You will have a week to complete the quiz. It will always be on the prior two weeks' material.

Participation
I would like everyone in class to participate in discussions and activities. We will have breakout activities during class time to work on these.

Mapping to Modules on Blackboard Site
The course follows the same format as the E-Live course which is conducted over six weeks. I've stretched the modules out a bit more and of course added lectures and activities in class. You should submit all assignments in the Blackboard site referenced above. Feel free to utilize lectures and videos that have been provided within the Blackboard site. They are there for your benefit.

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Meetings, Lectures & Assignments

Class Date	Topic	Reading	Assignment	Project	Quiz
9/2	Data Modeling	Chpts 1 and 2			
9/9	Intro to SQL	*12th Edition:* Coronel & Morris, sections 7.1 through 7.4 of chapter 7 *13th Edition:* Coronel & Morris, sections 7.1 through 7.3 of chapter 7, sections 8.1 and 8.2 in chapter 8	SQL Lab1 Due 9/16	Iteration 1- Concept Due 9/18	1 Due 9/19
9/16	Relational Model and ERD	Chpts 3 & 4			
9/23	ERD Continued and Interconnecting Data with SQL	*12th Edition:* Coronel & Morris, sections 7.5 through 7.7 of chapter 7, section 8.1 of chapter 8 *13th Edition:* Coronel & Morris, sections 7.4 through 7.6 of chapter 7, sections 8.3 and 8.4 in chapter 8 (note	SQL Lab 2 Due 9/30		2 Due 10/3

		that 8.4b, subqueries, will be covered in more detail later			
9/30	Advanced data modeling	Chpt 5		Iteration 2 – Business Rules Due 10/9	
10/7	Normalization	Chpt 6			
10/14	Aggregating Data	*12th Edition:* Coronel & Morris, section 8.3 and 8.4 of chapter 8. Note that section 8.2 will be read later *13th Edition:* Coronel & Morris, sections 7.7, 7.9, 7.10, and 7.11 of chapter 7 (note that section 7.8 regarding subqueries will be later). Section 8.5 of chapter 8.	SQL Lab 3 Due 10/21	Iteration 3 – Conceptual Design Due 10/23	3 Due 10/24
10/21	Database Design, Transaction Management and Concurrency Control	*Chpts 9 and 10*			
10/28	Database Programming	*Chpt 8*	SQL Lab 4 Due 11/4	Iteration 4 – Logical Design	4

Class Date	Topic	Reading	Assignment	Project	Quiz
11/4	Performance tuning and query optimization	sections 11.1 to 11.7 of chapter 11,		Due 11/6	Due 11/7
11/11	Distributed DBMS and Subqueries	*Chapter 12 12th Edition:* Coronel & Morris, section 8.2 of chapter 8 *13th Edition:* Coronel & Morris, section 7.8 of chapter 7	SQL Lab 5 Due 11/18	Iteration 5 - Submit SQL for use cases 2a, 2b, 3a, and 3b, and define your own use cases for 5a and 5b, for your Term Project in Iteration 5 Due 11/20.	5 Due 11/21
11/18	Advanced Topics – Data Warehouses	*handout*			
11/25	No class	*Thanksgiving*			
12/2	Advanced SQL	*handout*			6 Due 12/12
12/9	Project Presentations			Final Project Report Due	
12/16	Final Exam				