DEVELOPING BUSINESS APPS WITH SQL

SPRING 2025 | ISBA 4715 | Tue/Thu 11:50 AM –1:30 PM | Hilton 115 | Zoom
Prof. Greg Lontok | gregory.lontok@lmu.edu | Office: Hilton 114 | MS Teams
Zoom Office Hours: By appointment – Wed 1:45 pm – 2:45 pm, Fri 8:00 am –1:00 pm
Syllabus Last Updated on 2025-01-09

SQL: One of the most valuable skills.

This course introduces the use of SQL for creating and interacting with relational databases as well as for developing applications using application program interfaces and query programming languages. Students will gain hands-on experience in server level database installation, use of query languages for database creation, manipulation and information retrievals, and web-based applications that would interact with back-end databases for data and information management.

Prerequisites: BCOR 2710 and ISBA 3710 with a grade of C- or higher

You will learn the course material "the hard way," by making mistakes and finding solutions through trial and error.

It is important you follow along with the lesson exercises to learn by doing.

By the end of the semester, you will have a portfolio to prove you are "proficient in SQL."

There are no textbooks.

You will receive links to O'Reilly resources and online material.

What does a typical class look like?

This class emphasizes a practical, hands-on approach to learning. You will actively build your SQL skills by creating code and solving problems during the course. Our goal is not only to enhance your technical proficiency but also to develop your business acumen and soft skills, ensuring your readiness for a successful career as a data professional in the business world. Expect highly interactive classes with in-class exercises designed to simulate the types of questions you might encounter in interviews for data analyst or data engineer roles.

Synchronous Lessons

We will meet synchronously to actively discuss, assess, and apply previously covered and new material. Sessions will be recorded on Zoom, but you must be physically present in the classroom. Attending class via Zoom is not permitted.

Grade Distribution

2 Assignments	20%
3 Quizzes	15%
10 Lesson Exercises	10%
Midterm Interview	14%
Project	27%
Final Interview	14%

Points	Grade
93 - 100	A
90 - 92	A-
88 - 89	B+
83 - 87	B
80 - 82	B-
78 - 79	C+
73 - 77	C
70 - 72	C-
60 - 69	D
< 60	F

How are you evaluated?

Assignments

20%

There are **2 assignments (10% each)**. Each assignment will focus on the most recently covered material.

You can replace Assignment 02 with full credit if you participate in the LMU Datathon on April 4-5.

Late assignment submissions are penalized 10% per day. Late submissions include any assignments turned in after 11:59 PM on the due date. Always talk to me *beforehand* if there are issues.

Lesson Exercises

10%

There are **10 lesson exercises (1% each)** to help you keep up with the material. They are graded on a credit/no-credit basis. Partial credit is not given. Late submissions are not accepted.

Project

27%

This project combines data engineering and data analytics to showcase your business, SQL, critical thinking, and presentation skills.

You will identify a company and industry of interest from a job posting and use an API to gather data relevant to the company or its industry. This dataset will be used to perform SQL queries and generate insights. By the end, you'll have a mini portfolio piece tailored to the job posting.

Along with a proposal, there will be four milestones to guide your progress and provide feedback at each stage.

Exams (Interviews)

28%

The **midterm and final exams (14 each%)** are cumulative and conducted as 1-on-1, in-person whiteboard interviews. This format provides you with an opportunity to practice for a real-world data analyst and data engineer interview. You will be evaluated not only on the correctness of your responses but also on your problem-solving approach, your ability to explain your thought process clearly, and your proficiency in using relevant tools and techniques.

Quizzes

15%

There are **3 quizzes (5% each)** to serve as regular assessments to gauge your understanding of the material and reinforce your learning in a low-stakes environment.

Participation/Attendance

Your participation offers an opportunity for us to learn from each other. Participation comes in two forms: 1) vocal in-class participation 2) contributions made in the Teams chat during our synchronous class sessions.

While participation is not a graded component, please be aware there will be a **1% deduction for each unreported absence or tardiness** from your overall grade.

Week	Date	Topic	Due
1	Tue, Jan 14	5-Step Analytics Framework Filtering	
1	Thu, Jan 16	Aggregations Grouping	
2	Tue, Jan 21	RFM (Recency, Frequency, Monetary) Analysis Relational Data Model JOINs	
2	Thu, Jan 23	Traffic Source Analytics	
3	Tue, Jan 28	Dates Strings	Lesson Exercises 01
3	Thu, Jan 30	Quiz 01	
4	Tue, Feb 4	UNION Conditional Logic with CASE	
4	Thu, Feb 6	VIEWs	
5	Tue, Feb 11	VIEWs	Lesson Exercises 02
5	Thu, Feb 13	Subqueries	
6	Tue, Feb 18	Common Table Expressions (CTE)	Lesson Exercises 03
6	Thu, Feb 20	Common Table Expressions (CTE) Window Functions	
7	Tue, Feb 25	Window Functions Presentation Skills	Lesson Exercises 04
7	Thu, Feb 27	Assignment 01 Presentations	Lesson Exercises 05 Assignment 01
8	Tue, Mar 4	**No Class - Spring Break**	
8	Thu, Mar 6	**No Class - Spring Break**	
9	Tue, Mar 11	Quiz 02 & Data Analyst Interview Prep	
9	Thu, Mar 13	Quiz 02	
10	Tue, Mar 18	Data Analyst Interview	
10	Thu, Mar 20	Data Engineering	
11	Tue, Mar 25	Cloud Relational Databases with AWS RDS Extract and Load with Airbyte	
11	Thu, Mar 27	APIs	Lesson Exercises 06
12	Tue, Apr 1	Web Scraping	
12	Thu, Apr 3	Data Lakes & Data Warehouses	Lesson Exercises 07
12	Sat, Apr 5	LMU Datathon	
13	Mon, Apr 7		Project Proposal
13	Tue, Apr 8	Assignment 02 Presentations Project Overview	Assignment 02 Lesson Exercises 08
13	Thu, Apr 10	Production Data Pipeline PostgreSQL, GitHub	

14	Tue, Apr 15	Production Data Pipeline Continued Environment Variables	
14	Thu, Apr 17	**No Class – Easter Holiday**	
15	Tue, Apr 22	Automation with GitHub Actions	Project Milestone 01 Lesson Exercises 09
15	Thu, Apr 24	Transformations with dbt Dimensional Modeling	
16	Tue, Apr 29	Visualization with Looker/Tableau/Power BI Optimizing Queries with Indexes	Lesson Exercises 10
16	Thu, May 1	Quiz 03	Project Milestone 02
17	Tue, May 6	Data Engineer and Data Analyst Interview Prep	Project Milestone 03
18	Sun, May 11		Project Milestone 04
18	Tue, May 13	Data Engineer and Data Analyst Interview	

Last day to withdraw: Friday, April 11
Tentative Nature of the Syllabus: If necessary, this syllabus and its contents are subject to revision; students are responsible for any changes or modifications announced or distributed in class or posted on Brightspace or Teams.

Optional Reference Text

Available through the library's O'Reilly subscription

- Beaulieu, A. "Learning SQL" 3rd Edition
- Reis, J., Housley, M. "Fundamentals of Data Engineering"

Course Policies

Citizenship. has to do with attendance as well as how you treat others. Most wars, fights, retaliations, & insults happen when people feel their dignity has been assaulted. So please, act with **professionalism** and **respect** each individual's opinions and beliefs--even if you disagree.

Cell phones. Please keep your cell phones **on silent** (or take it outside for emergencies) so that we can focus. Again, it's a dignity/respect thing. We all know that feeling when you're talking to a friend and his or her attention is on the phone...

Teams. For a faster response, use Teams instead of email to communicate with me. Before sending a message, please follow these recommendations:

1. Environment (Mac/Windows)
2. Steps to reproduce
3. Expected result
4. Actual result
5. Visual proof (screenshots, videos, text)

Academic Honesty. Loyola Marymount University is a community dedicated to academic excellence, student-centered education, and the Jesuit and Marymount traditions. As such, the University expects all members of its community to act with honesty and integrity at all times, especially in their academic work. Academic honesty requires that all members of the LMU community act with integrity, respect their own intellectual and creative work as well as that of others, acknowledge sources consistently and completely, act honestly during exams and on assignments, and report results accurately. As an LMU Lion, by the Lion's Code, you are pledged to join the discourse of the academy with honesty of voice and integrity of scholarship.

Academic dishonesty will be treated as an extremely serious matter, with serious consequences that can range from receiving no credit for assignments/tests to expulsion. It is never permissible to turn in any work that has been copied from another student or copied from a source (including Internet) without properly acknowledging/citing the source. It is never permissible to work on an assignment, exam, quiz or any project with another person unless your instructor has indicated so in the written instructions/guidelines. It is your responsibility to make sure that your work meets the standard of academic honesty set forth in the "Academic Honesty Policy" found at: https://academics.lmu.edu/honesty/
For an additional resource, see and the "LMU Honor Code and Process" found at:
https://bulletin.lmu.edu/content.php?catoid=1&navoid=18#LMU_Honor_Code_and_Process

Special Accommodations. The DSS Office offers resources to enable students with physical, learning, ADD/ADHD, psychiatric disabilities, and those on the autism spectrum to achieve maximum independence while pursuing their educational goals. Staff specialists interact with all areas of the University to eliminate physical and attitudinal

barriers. Students must provide documentation for their disability from an appropriate licensed professional. Services are offered to students who have established disabilities under state and federal laws. We also advise students, faculty, and staff regarding disability issues. Students who need reasonable modifications, special assistance, academic accommodations, or housing accommodations should direct their request to the DSS Office as soon as possible. All discussions will remain confidential. The DSS Office is located on the 2nd floor of Daum Hall and may be reached by email at dsslmu@lmu.edu or phone at (310) 338-4216. Please visit http://www.lmu.edu/dss for additional information.

5 Tips for Succeeding in Class

Don't Disappear
My mission is to help you succeed. It's hard to do that if you don't ask for help. If you're not sure about something, post in Teams to the entire channel or DM (direct message) me. Email me. With so many students every year, I can only remember those who are "present." Think of me as a coach who's there to get the best out of you, rather than some cold, inaccessible professor. I'll do my best. Start by "showing up" everywhere.

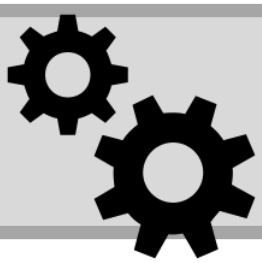
If You Have a Problem, Come to Me with a Solution
We all have issues that come up: you may have difficulties with an assignment or a group member, you may be absent due to something that comes up and an assignment is due, etc. Tell me the problem and follow it by saying, **"I intend to…"** (and then give me an attempt at a solution that might work for both you and me). Communication is key.

Cultivate a Professional Relationship
Students don't always think this way - that professors can be awesome connections to opportunities like jobs and more - so they unintentionally burn bridges. When you talk with me, ask questions before class starts, Teams DM/email me for advice, etc., guess who I'll think of when something good comes up? (Caveat: you must do well academically, of course, not just talk a good game!) Let's connect: https://www.linkedin.com/in/lontok/

Present Yourself Professionally at All Times
Continuation of Tip 3. How you dress, how you talk, how you approach feedback, how you submit assignments, etc. tells me everything about whether you have a good chance at succeeding - in this class or in a career.

If You're Shy, Teams Message More
Not everyone wants to raise their hands or speak up. You can participate through the Teams chat during class. My point is to find a way to *show* me you're learning. Be creative. Just don't disappear - that's the death of success.

The Technical Stuff...



Course Outcomes

1. Become a data analyst: use SQL for data exploration and analysis.
2. Become a data engineer: use modern technologies to extract, transform, and load data.
3. Become a data professional: communicate data findings to both technical and non-technical audiences.

Emergency Preparedness

To report an emergency or suspicious activity, contact the LMU Department of Public Safety by phone (x222 or 310-338-2893) or at the nearest emergency call box. In the event of an evacuation, follow the evacuation signage throughout the building to the designated safe refuge area where you will receive further instruction from Public Safety or a Building Captain.
http://www.lmu.edu/emergency

CBA Mission
Advance knowledge and develop business leaders with moral courage and creative confidence to be a force for good in the global community.

ISBA Major Learning Outcomes
1. Utilize competencies gained from hands-on experience in core information technologies including programming languages, database management systems and other software used to create and store data, interact with databases in a SQL environment and develop database applications through web and mobile interfaces
2. Apply critical thinking and problem-solving skills when analyzing business problems
3. Identify problems, structure problems, propose an IT solution, and solve the problem
6. Develop proficiency in one or more mainstream programming language, such as SQL, PHP, JavaScript, and Python
7. Effectively communicate complex technological concepts including oral communications and written communications