Course Description and Learning Outcomes
A broad introduction to relational database systems, this course will provide students with a combination of conceptual understanding and technical practice. Students will learn about the relational model, which provides the logical framework for designing and querying relational databases. Students will also learn important technical and conceptual approaches to database design, including user-oriented design, requirements analysis and specification, entity relationship modeling, and normalization. Students will put these fundamentals into action by learning and using the Structured Query Language (SQL) and a database management system (DBMS) to build, populate, and query a working database.
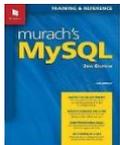
After successfully completing this course you will be able to:
- Create user-oriented database queries using the Structured Query Language (SQL);
- Described the relational model as a logical system for structuring data for retrieval;
- Translate user needs into functional database requirements by using entity-relationship models that conform to the relational model;
- Build a working relational database using a database management system (DBMS);
- Normalize and de-normalize a relational database to optimize performance;
- Identify security issues in databases and develop approaches to address them.

Required Resources
Course website: https://umd.instructure.com/courses/1252444
Textbook website: https://www.murach.com/shop/murach-s-mysql-2nd-edition-detail

Murach's MySQL
Murach, J.
Second edition (2015)
ISBN # 1890774820

Additional readings and resources may be assigned as needed. Extra material will be announced in class and via Canvas.

The following required software must be installed on your laptop:
dev.mysql.org/downloads
- MySQL Community Server 8
- MySQL Workbench 8

We will often work through SQL examples during lecture. Please bring your laptop to class, with sufficient charge. The number of outlets in the classroom is very limited.

Tammie Nelson
tnelson7@umd.edu

Class Meets
Tues & Thurs
2:00pm – 3:15pm
LEF 2166

Office Hours
HBK #4117M
Wednesday
noon-1:00pm
or by appointment

Prerequisites
Pre-requisite: INST126, CMSC122, or CMSC106
Pre- or co-requisite: INST201, INST301.

Course Communication
Slides, practice problems, assignments, quizzes, and other important information will be posted to Canvas. Important information will be communicated via the Inbox, Announcements, and Discussion areas. Customize your alerts to ensure that you receive notifications via your preferred email account.

Communicate with me via Canvas inbox or directly to tnelson7@umd.edu. Except for weekends and holidays, I will do my best to respond to you within 24 hours. Descriptive email subject headings will expedite my response. When corresponding about the group project, always include the group number in the email.

Campus Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics such as:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit www.ugst.umd.edu/courserelatedpolicies.html for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.

Course Policies

- Attend class and arrive on time
- Bring a charged laptop to class
- Participate in class
- Monitor Canvas daily; adjust settings as needed to ensure that you receive notifications
- Follow course calendar activities:
  - o Read chapters prior to lecture
  - o Complete quizzes as assigned
  - o Review practice problems prior to in-class labs
  - o Complete labs in class and submit via Canvas
  - o Submit all individual and group assignments via Canvas on time
- All group members must participate in group project

Office Hours, Topic Clinics, Group Project Support

If you need extra clarification of a lecture topic, lab exercise, or quiz; or if you need assistance with a homework assignment, please come to office hours. In addition to the instructor office hour, there will be peer mentor office hours which will be announced via Canvas.

Special clinics will be scheduled, centered around specific topics, homework assignments, and group project deliverables. These will be announced in class and via Canvas.

Once the group project work is underway, I will schedule special timeslots for group project support. You will need to reserve these timeslots ahead of time and it is preferable that at least two team members attend. This will be scheduled via Google sheets; details to be announced a few weeks into the semester.

Additional University Resources

You are expected to take personal responsibility for you own learning. This includes acknowledging when your performance does not match your goals and doing something about it. Everyone can benefit from some expert guidance on time management, note taking, and exam preparation, so I encourage you to consider visiting http://ter.ps/learn and schedule an appointment with an academic coach. Sharpen your communication skills by visiting http://ter.ps/writing and schedule an appointment with the campus Writing Center. Finally, if you just need someone to talk to, visit http://www.counseling.umd.edu.

Course Activities and Assessments

- **Lectures**
  It is expected that you will complete assigned chapter(s) of reading **prior** to class time. Lectures will be interactive; please arrive in class on time and prepared to participate. You may have your laptops open during lecture but only for class activities such as note-taking, referencing an e-copy of the book, or running class exercises in MySQL Workbench.

- **Guest Lectures**
  There will be guest lecturers during the semester. The topics will be selected to augment our class materials with current database developments. These lectures are not optional. Attendance will be taken and there may be quiz questions based on guest lecture topics. Please respect the guest lecturer's time.

- **Quizzes**
  Ten open-book quizzes will test your comprehension of class readings and lectures. Quizzes are individual work. Quizzes will become available immediately following Tuesday's class and will be due by 9pm on Wednesday. Most quizzes will have a 30 minute time limit from when you begin the quiz. Quizzes will be based on that week's readings.

- **Lab Exercises**
  There will be ten in-class lab exercises, usually on Thursdays. You will receive these practice problems ahead of time and should preview them before class, but you must execute them in class with instructor assistance as needed. You will submit your work via Canvas, and these will receive a pass/fail completion grade. Some lab exercises will be done with your project group.

- **Homework Assignments**
  There will be four required assignments plus one optional assignment which can be submitted in an attempt to increase the average assignment score. Most of the questions will be practical tasks, such writing SQL queries, constructing a view, completing or correcting a stored procedure, normalizing a database. The assignments are individual work. Although you may consult with your classmates and the instructor to develop general approaches to solving questions, you must work individually while you build, type, test and debug your answers. Assignment questions will be available on Canvas. Completed assignments will be submitted via Canvas. Timely submission of the completed assignments is essential. The due date of each assignment will be stated clearly in the assignment description. If an assignment due date is a religious holiday for you, please let the instructor know as soon as the assignment is announced, so an alternate due date can be set for you.

- **Group Project**
  Students will work in teams of five students to design and build a non-trivial relational database. Project-related work is central to this course: the project accounts for 40% of graded work. The project will involve identifying an end-user need for a relational database, determining the requirements for the database, developing a deadline-oriented plan for building the database, designing the logical specifications, building and populating the database, and developing queries/views that will showcase the capabilities of the database for fulfilling the identified user needs. Students will be assigned to groups by the instructor.

- **Mid-term Exam**
  A mid-term exam will be administered to test your understanding of data modeling and relational database concepts, as well as your SQL skills. The mid-term exam may include textual questions such as those that

ask for definitions of and comparisons between data modeling and relational database concepts, as well as query challenges. Some of the questions may be related to students' work on the group project.

- **Final Exam**
  A final exam will be administered to test your understanding of data modeling and relational database concepts, as well as your SQL skills. The final exam may include textual questions such as those that ask for definitions of and comparisons between data modeling and relational database concepts, as well as query challenges. Some of the questions may be related to students' work on the group project.

Grades

Grades are not given, but earned. Your grade is determined by your performance on the learning assessments in the course. All assessment scores will be posted on Canvas. If you would like to discuss your grade, or have questions about how something was scored, please email me to schedule a time for us to meet. Grade disputes must be submitted in writing within one week of receiving the grade.

A few individual and group assignments will allow slightly late submission for a deduction; in these cases, the penalties will be clearly indicated within the assignment. Obviously, it is much better to submit on time! Assignments submitted beyond the final due date will not be accepted and you will receive a zero. Not all assignments will allow for late submission; please read all submission instructions carefully.

This table illustrates the percentage weight of each assessment towards your final grade.

Component		Percentage
Lab Exercises		5%
Quizzes		5%
Assignments		20%
Group Project		40%
Project Team Report	*3%*	
Project Proposal	*5%*	
Proposal Review	*2%*	
Progress Report	*5%*	
Final Project	*20%*	
Peer Review	*5%*	
Mid-term Exam		15%
Final Exam		15%

Final letter grade cutoffs are illustrated in the following table:

Final Grade Cutoffs									
+	97.00%	+	87.00%	+	77.00%	+	67.00%		
A	93.00%	B	83.00%	C	73.00%	D	63.00%	F	<60.0%
-	90.00%	-	80.00%	-	70.00%	-	60.00%		

Note: There is no automatic rounding: for example, an A- is 90.0, not 89.5 or 89.9. However, I may choose to round up, taking attendance, class participation, and group contributions into account. There will be no rounding up if you have missing or late assignments.

Course Schedule (v1 - subject to change)

Date	Description	Reading	Quiz	Lab	Assignment	Project Deliverable
8/28/18	Course Introduction					
8/30/18	Relational Database Concepts	Chapter 1	1			
9/4/18	SELECT from single table Installation Checkpoint	Chapter 3				
9/6/18	Lab day: Workbench and SELECT	Chapter 2	2	1		
9/11/18	Relationship types / Joins	Chapter 4				
9/13/18	Lab day: Multiple table SELECTs		3	2		
9/18/18	Group project overview INSERT / UPDATE / DELETE	Chapter 5			Assignment 1 due 9/17	
9/20/18	Lab day: Group project introduction; INSERT/UPDATE/DELETE		4	3(g)		
9/25/18	Aggregate functions Summary queries	Chapter 6 Chapter 7				
9/27/18	Subqueries		5	4		
10/2/18	Normalization overview	Chapter 10			Assignment 2 due 10/1	
10/4/18	Normalization class exercise Lab day: evaluate a database			5 (g)		Project Team Report due 10/3
10/9/18	Data Types / Functions	Chapter 8 Chapter 9				
10/11/18	ERDs / Forward Engineering / Midterm Review	Chapter 11	6		Assignment 3 due 10/12	
10/16/18	Midterm Exam					
10/18/18	Lab day: Design a database and forward engineer			6 (g)		Project Proposal due 10/17
10/23/18	Indexes / Views	Chapter 12				
10/25/18	Transactions and Locking	Chapter 14	7			Peer Review due 10/29
10/30/18	Stored Procedures / Triggers	Chapter 15 Chapter 16				
11/1/18	Lab day: stored procedures	Chapter 13	8	7		

Date	Description	Reading	Quiz	Lab	Assignment	Project Deliverable
11/6/18	Database Admin and Security	Chapter 17 Chapter 18			Assignment 4 due 11/5	
11/8/18	Lab day: Group project work		9	8 (g)		
11/13/18	ETL / Sample Data Strategies / Workbench Data Import					
11/15/18	Lab day: import data into a database			9 (g)		
11/20/18	Guest Lecture - TBD					Progress Report due 11/19
11/22/18	Thanksgiving!					
11/27/18	Database Backup / Restore & Reverse Engineering	Chapter 19				
11/29/18	Lab day: backup/restore/reverse engineer			10 (g)	Assignment 5 due 11/28 (optional)	
12/4/18	Non-relational databases					
12/6/18	Lab day: Non-relational databases		10			Final Project due 12/5
12/15/18	Final Exam					

(g) in lab column means it will be a group lab