



Course Syllabus * FALL 2018

INST 327 – Database Design and Modeling Section 0103

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.

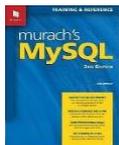
After successfully completing the course you will be able to:

- 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/1254427>

Textbook: <https://www.murach.com/shop/murach-s-mysql-2nd-edition-detail>



Murach's MySQL
Murach, J.
Second edition (2015)
ISBN: 9781890774820

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

Required Software can be installed on your laptop.

<http://dev.mysql.com/downloads/installer/>

- 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 minimal.

Pamela Duffy

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[pronouns: she/her/hers](#)

Class Meets

Mon, Wed, & Fri
1:00 PM – 1:50 PM
PHY #4221

Office Hours

As announced

Teaching Assistants

Itai Amon,

iamon@terpmail.umd.edu

Nick DeWitt,

nickdewitt115@gmail.com

Office Hours: as announced

Prerequisites

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

Course Communication

Slides, practice problems, assignments, quizzes, and other information will be posted on 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 pduffy@umd.edu.

Email subject headings should begin with "INST327: "".

When corresponding about the team project, always include the team 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 receipt of all notifications
- Follow course calendar activities:
 - Read chapters before the lecture
 - Complete quizzes as assigned
 - Review practice problems before in-class labs
 - Complete labs in class and submit via Canvas
 - Submit all individual and team assignments via Canvas on time
- All team members must participate in the team project

Additional University Resources

You are expected to take personal responsibility for your 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>.

Names/Pronouns and Self Identifications

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit trans.umd.edu to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all your fellow Terps.

Office Hours, Topic Clinics, Group Project Support

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

Once team project work is underway, a schedule will be posted with timeslots for project support. Details will be

announced a few weeks into the semester. Support appointments will be scheduled via Google sheets and timeslots must be reserved in advance. At least two team members should attend support appointments.

Course Activities and Assessments

- *Lectures:* You are expected to complete the reading of assigned chapter(s) 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.
- *Quizzes:* Ten open-book quizzes will test your comprehension of class readings and lectures. Quizzes are individual work. They will usually be administered on Wednesdays, covering the readings from Monday and Wednesday of that week. Most quizzes will become available following Wednesday's class and will be due by 11:59 PM on Thursday. Most quizzes will have a 30-minute time limit from when you begin the quiz.
- *Lab Exercises:* There will be ten in-class lab exercises, usually on Fridays. You will receive these practice problems ahead of time and should preview them before class, but you must execute them in class with instructor or peer mentor 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 team.
- *Homework Assignments:* There will be several assignments, each of which will include multiple questions. Most of the questions will be practical tasks, such as writing SQL queries, constructing a view, normalizing a table, or developing a stored procedure. The assignments are individual work. Although you may consult with your classmates, the peer mentors, 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 explicitly 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 that an alternate due date can be set for you.
- *Team Project:* Students will work in 4 to 5-person teams 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 teams by the instructor. Teams will choose their topics from a list of possible project topics.
- *Mid-term Exam:* A mid-term exam will be administered to test students' understanding of data modeling and relational database concepts, as well as their 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 team project.
- *Final Exam:* A final exam will be administered to test students' understanding of data modeling and relational database concepts, as well as their 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 team project.

Grades

Your course 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 schedule a time with the course TA. Grade disputes must be submitted in writing within one week of receiving the grade.

A few assignments will allow slightly late submission for a percent deduction on the score. In such cases, the cut-off times and associated penalties will be indicated in the assignment. 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%
<i>Project Team Report</i>	3%
<i>Project Proposal</i>	5%
<i>Proposal Review</i>	2%
<i>Progress Report</i>	5%
<i>Final Project</i>	20%
<i>Peer Review</i>	5%
Mid-term Exam	15%
Final Exam	15%

Letter grades will be assigned using the following scale.

Grading Scale								
A+	≥ 97%	B+	≥ 87.00%	C+	≥ 77.00%	D+	≥ 67.00%	
A	≥ 93.00%	B	≥ 83.00%	C	≥ 73.00%	D	≥ 63.00%	F <60.0%
A-	≥ 90.00%	B-	≥ 80.00%	C-	≥ 70.00%	D-	≥ 60.00%	

Note: There is no automatic rounding: for example, an A- is at least 90.00, 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 (This schedule is for planning purposes and may change. See Canvas (ELMS) for current information and deadlines.)

Session	Date	Topics	Reading	Non-Project Work	Project Work
1	8/27, M	<ul style="list-style-type: none"> Introduction, course goals, class policies, textbook, software, participation, review syllabus, review Canvas Software installation 	Appendix A Appendix B	Download MySQL Server and MySQL Workbench	
2	8/29, W	Relational Database Concepts	Chapter 1		
3	8/31, F	SELECT from Single Table (NO LAB)	Chapter 3		
4	9/5, W	<ul style="list-style-type: none"> SELECT from a single table Installation Checkpoint 	Chapter 3	Software installed, configured, & tested	Introduction of Team Project Process
5	9/7, F	LAB: Workbench & SELECT	Chapter 2		
6	9/10, M	Relationship types / Joins	Chapter 4		
7	9/12, W	Joins / UNION	Chapter 4		
8	9/14, F	LAB: Multiple table SELECTs			
9	9/17, M	Team project overview INSERT / UPDATE / DELETE	Chapter 5		
10	9/19, W	INSERT / UPDATE / DELETE	Chapter 5	Assignment 1 due	
11	9/21, F	LAB: INSERT / UPDATE / DELETE			
12	9/24, M	Aggregate functions Summary queries	Chapter 6		
13	9/26, W	Subqueries	Chapter 7	Assignment 2 due	
14	9/28, F	LAB: Summary / Subqueries			
15	10/1, M	Data Types	Chapter 8		Project Plan due Monday, 10/1, 11:59 PM (Develop preliminary project plan)
16	10/3, W	Functions	Chapter 9		
17	10/5, F	LAB: Subqueries & Functions			

18	10/8, M	Normalization, Dependencies, Relationships	Chapter 10		
19	10/10, W	Dependencies & Relationships Normalization Class Exercise	Chapter 10	Assignment 3 due	
20	10/12, F	LAB: Normalization; DB Evaluation			
21	10/15, M	Lab Review Midterm Exam Review			
22	10/17, W	Midterm Exam			
23	10/19, F	LAB: In-class Group work on Team Project			Project Proposal due Friday, 10/19, 11:59 PM (Propose detailed project plan)
24	10/22, M	Entity-Relationship Diagrams	Chapter 10 (re-read) Chapter 11		
25	10/24, W	Database Creation	Chapter 11		
26	10/26, F	LAB: ERD & forward engineering; Creating/altering DBs & tables			
27	10/29, M	Views	Chapter 12		Peer Review of Proposal due Monday, 10/29, 11:59 PM (Assess another team's proposal)
28	10/31, W	Stored Procedure Development	Chapter 13		
29	11/2, F	LAB: In-class Group work on Team Project: ERD			
30	11/5, M	Transactions, Concurrency, & Locking	Chapter 14		
31	11/7, W	Stored Procedures	Chapter 15		
32	11/9, F	LAB: Indexes, Views, & Stored Procedures			

33	11/12, M	Functions, Triggers, Events in depth	Chapter 16		Project Progress Report due Monday, 11/12, 11:59 PM (Report project progress)
34	11/14, W	Database Admin	Chapter 17	Assignment 4 due	
35	11/16, F	LAB: Data import/export; Backup/Restore; Reverse Engineering			
36	11/19, M	Database Security, Backup, & Restore	Chapter 18 Chapter 19		
--	11/21, W	THANKSGIVING BREAK - NO CLASS			
--	11/23, F				
37	11/26, M	ETL / Sample Data Strategies / Workbench Data Import			
38	11/28, W	In-class Group work on Team Project: Forward Engineering			
39	11/30, F	LAB: In-class Group work on Team Project: Sample Data / Queries		Assignment 5 due (optional)	
40	12/3, M	In-class Group work on Team Project			Project DB and Report due Monday, 12/3, 11:59 PM (Report project work and DB)
41	12/5, W	Non-relational databases			
42	12/7, F	In-class Group work on Team Project: Project Report / Wrap-Up			
43	12/10, M	Review for final			