



Course Syllabus * FALL 2022

INST 123 – Databases for All

Sections 0101, 0102, 0103

Course Description and Learning Outcomes

INST 123 is a 3-credit Gen Ed Distributive Studies Scholarship in Practice course. It is an introduction to relational databases for students with no previous programming experience. This course provides a means for students of diverse backgrounds to successfully learn how to store, retrieve, and maintain data in relational databases. Students are not expected to have any computer programming experience prior to taking this course.

Topics include a brief comparison of database systems with an emphasis on relational databases, fundamental relational database concepts, and data types. It also includes technical approaches to accessing information stored in relational databases, including problem analysis, query creation, and execution, as well as debugging techniques. Students will implement solutions by learning and using the Structured Query Language (SQL) and a relational database management system (RDBMS) to populate and query a series of sample databases. This is a hands-on course; students will be writing, analyzing, and testing SQL queries. The overall objective of this course is to provide a foundational understanding of relational databases, the methods through which the information housed in such databases can be efficiently accessed and maintained, and the process of working with information professionals to design and implement relational databases to meet the information needs for a wide variety of subjects.

After successfully completing the course, you will be able to:

- Explain relational database principles, concepts, and holistic data-set oriented programming methods.
- Create user-oriented database queries using the Structured Query Language (SQL).
- Develop SQL views, functions, and stored procedures by applying SQL programming concepts.
- Test and assess the quality of SQL procedures.
- Write useful in-code comments and other documentation.
- Describe 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.
- Explain how the use and design of relational database systems reflect broader social and organizational structures and the related ethical and equity issues.

Instructors

C. Scott Dempwolf
(Dr. Dempwolf)
dempy@umd.edu

In-Class Meetings Lecture:

01xx: T/Th 12:30-1:20pm MMH 1400
<https://maps.umd.edu/map/>

Discussion/Lab

0101: F 10:00-10:50 am
0102: F 11:00-11:50 am
0103: F 12:00-12:50 am

Sessions:

HBK 0115
HBK 0115
HBK 0115

Office Hours – See ELMS

Teaching Assistants

Pranav Adiraju (GTA)
Asmita Samanta (GTA)
Bingqi Lian (Grader)
Sindhuja Sane (Grader)
Unisa Bangura (UTA)
Michaela James (UTA)
Bharat Choudhury (UTA)
Julietta Yuyun Cho

Academic Peer Mentors

See ELMS

Prerequisites: None

Course Communication

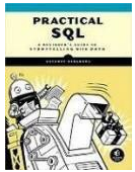
Use ELMS for messages to instructors, TA, and AMPs.

- Email subject headings should begin with “INST123 - ”.
- Messages about the project should include the team number in the heading.
- Slides, practice problems, assignments, quizzes, and other information will be posted on ELMS. 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.

Required Resources

Course ELMS Website: <https://umd.instructure.com/courses/1354121>

Textbook:



Practical SQL: A Beginner's Guide to Storytelling with Data (2018)
Anthony DeBarros, No Starch Press, ISBN: 9781593278274

Physical copies are available via the campus bookstore. Ebooks are available via multiple sources. Additional readings and resources may be assigned via ELMS.

We will often work through SQL examples during the lecture. Please have a computer available for course-related work.

Software:

- PostgreSQL (for information see <https://www.postgresql.org/>) and PgAdmin (for the installation package see <https://www.postgresql.org/download/>)
 - **Please check ELMS for download and installation instructions, videos and other resources. Feel free to seek help from the instruction team and the peer mentors (AMPs).**

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 us if you have questions.

Course Policies

- Stay engaged with the course and participate.
- There are many ways you can participate, including attending lecture and discussion sessions, pair or group work, and project teamwork.
- Have a computer available for course-related work.
- Monitor ELMS daily; adjust settings as needed to ensure receipt of all notifications.
- Follow course calendar activities:
 - Keep up with assigned readings and execute examples before the lecture.
 - Review practice problems before live lab sessions.
 - Complete worksheets, homework, and quizzes as assigned.
 - Complete labs during discussion session and submit via ELMS.
 - Submit all individual and team assignments via ELMS on time (Some assignments cannot be submitted late, and others have late penalties. If you have an excuse, contact the instructor or a TA before the deadline whenever possible!)
 - Do not wait until the deadline to make your ELMS submission! ELMS will mark submissions as "late" even if the submission is only late by 1 or 2 minutes! Technical issues at 10 pm on the due date are NOT our emergency!
- All team members must participate in the team project.
- If you are struggling with course content, course schedules, please reach out to the instructors and TAs.

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 we encourage you to consider visiting <https://counseling.umd.edu/cs/commonconcerns> and schedule an appointment with an academic coach. Sharpen your communication skills by visiting <https://english.umd.edu/writing-programs/writing-center> and schedule an appointment with the campus Writing Center. Finally, if you 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 an equitable classroom environment. We 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 <https://lgbtq.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. We will do our best to address and refer to all students accordingly, and we 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 attend online office hours. In addition to the instruction team's office hours, there will be peer mentor (AMP) office hours which will be announced via ELMS.

Course Activities and Assessments

This course involves formative and summative assessment components, as well as an applied team project, which serves as the Scholarship in Practice component for the course. Many of the activities and assessments are designed to support the semester-long Team Database Design and Optimization project. Activities gauge your understanding and expertise of the SQL skillset and readiness to perform the related project work.

- *Lectures*: You are expected to complete the assigned reading before class time. Lectures will be interactive. Participation is necessary in order to excel at this course. If you anticipate missing a session, email the instructors and TA ahead of time, or contact us soon afterwards. At least three "participation instances" per week is advised and encouraged.
- *Discussions (5% of final grade)*: Biweekly, asynchronous online discussions will test your understanding of the concepts and skills covered in the course. Students will be expected to post a main contribution, responses to other students, and a final contribution summarizing their take-aways from the exchange. [F/I]
- *Muddiest Point Clarifications (10% of final grade)*: Every other week, students will be asked to suggest a concept or skill covered in the previous week and they did not understand well. An integrated list will be compiled based on individually suggested topics. Each project team will then prepare a video, slideshow, or similar artifact to clarify the topic/point of their choice. [F/T]
- *Lab Exercises (15% of final grade)*: Lab exercises provide practice of the skills necessary for a comprehensive understanding of SQL and the successful completion of the team project. You will receive these practice problems ahead of time and should preview them before class, but you must execute them during class with the instructor's or peer mentor's assistance as needed. You will submit your work individually via ELMS and will receive a completion grade. Most lab exercises will take place on Thursdays and many

will be done with your project team to foster team cohesion. On discussion/lab days, attendance is required for full credit on the lab exercise. Sign-in logs will be used to track attendance. [F/I]

- *Quizzes (5% of final grade):* Quizzes will test your comprehension of concepts and skills covered in the given week. Quizzes are individual work. Most quizzes will become available during the week and will be due the following Monday. Quizzes will have a 30-minute time limit from when you begin the quiz. [S/I]
- *Homework Assignments(25%offinalgrade):* There will be several assignments, each of which will include multiple questions. Most of the questions will be practical tasks, such as debugging SQL queries, writing SQL queries, inserting or updating data, or constructing a view. The assignments are individual work. Although you may consult with your teammates, 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 ELMS, and completed assignments will be submitted via ELMS. 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 possible, so that an alternate due date can be set for you. (See course schedule below for due dates). [S/I]
- *Team Database Design and Optimization Project (35%of final grade):* Students will work in teams to design a database to address a particular information need. As a Scholarship in Practice course, project-related work is central to this class. The project will involve defining the team structure and responsibilities for individual team members, identifying the chosen information need, determining the requirements for the database, developing a deadline-oriented plan and schedule for building the database, designing the logical specifications, creating and populating the database, and developing queries/views that will showcase the capabilities of the database for fulfilling the identified user needs. Students will choose their teams or be assigned to teams by the instructors. Teams will choose their topics from a list of possible project topics. Central to this project will be team management and team interaction. Project deliverables throughout the semester will include assessment of team function as well as the software development process. Academic Peer Mentors (AMPs) will act as team mentors throughout the life cycle of the project. [A/T+I]
- *Team Standups (5% of final grade):* Project teams will provide periodic updates about their progress on the project. The updates may be asked to be presented as write-ups, slideshows, or brief recorded videos. Details will be made available during the semester. [A/T]

[F: Formative (30%) - S: Summative (30%) - A: Applied (40%) /I: Individual (56%) - T: Team (44%)]

Grades

Your course grade is determined by your performance on the learning assessments in the course. Assessment scores will be posted on ELMS. 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 a late submission. Please read all submission instructions carefully!

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

Component	Percentage
Discussions	5%
Muddiest Point Surveys and Clarifications	10%
Lab Exercises	15%
Quizzes	5%
Homework Assignments	25%
Team Project	35%
<i>Team Contract (T)</i>	2%
<i>Project Proposal (T)</i>	6%
<i>Progress Report (T)</i>	6%
<i>Peer Evaluations (I)</i>	4%
<i>Final Deliverable & Report (T)</i>	15%
<i>Project Reflection (I)</i>	2%
Project Stand-ups	5%

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%
A-	≥ 90.00%	B-	≥ 80.00%	C-	≥ 70.00%	D-	≥ 60.00%
						F	<60.0%

Course Schedule (This schedule is for planning purposes and may change. See ELMS for current information and deadlines.)

Week	Lecture	Date	Topics and Classwork	Readings	Homework	Team Project Assignments
1	1	8/29, T	Introduction, Syllabus, Course Expectations	Syllabus & ELMS Site		
	2	8/31, TH	PostgreSQL and PgAdmin Installation	See ELMS	PostgreSQL Setup	
2	3	9/5, T	Creating Your First Database	Chapter 1		Introduction of Team Project Process
	4	9/7, TH	LAB 1: PostgreSQL Setup & Creating a DB		PostgreSQL Setup,	Team Formation Survey
3	5	9/12, T	Exploring Data with SELECT	Chapter 2		
	6	9/14, TH	LAB 2: Creating Queries (SELECT)			Form teams; Students without a team will be assigned to a team
4	7	9/29, T	Data Types	Chapter 3		Work with team to assign roles and responsibilities
	8	9/21, TH	LAB 3: Using Data Types			
5	9	9/26, T	Importing and Exporting Data	Chapter 4	Assignment 1: Basic Queries	Submit Team Contract Monday, 9/26, 11:59 PM
	10	9/28, TH	LAB 4: Data Import and Export			Project Standup #1 [Meet an AMP]
6	11	10/3, T	Math and Statistics with SQL	Chapter 5		
	12	10/5, TH	LAB 5: Using Math to Understand Data			
7	13	10/10, T	Joining Tables	Chapter 6	Assignment 2: Data Import/Export	
	14	10/12, TH	LAB 6: Multi-Table Queries			Project Proposal due Friday, 10/14, 11:59 PM (Detailed project plan and proposal)
8	15	10/17, T	Designing Tables	Chapter 7		
	16	10/19, TH	LAB 7: Designing Tables			
9	17	10/24, T	Grouping and Summarizing	Chapter 8		
	18	10/26, TH	LAB 8: Grouping & Summarizing			Project Standup #2 [Meet with AMP Team Mentor to discuss Proposal and clarify next steps]
10	19	10/31, T	Modifying Data: The CUD in CRUD	Chapter 9	Assignment 3: Multi-Table and Aggregate Queries	
	20	11/2, TH	LAB 9: C*UD – Modifying Data			

Week	Lecture	Date	Topics and Classwork	Readings	Homework	Team Project Assignments
11	21	11/7, T	Statistics in SQL Working with Dates & Times	Chapters 10-11		
	22	11/9, TH	LAB 10: Statistics in Data Dates & Times			Project Standup #3 [Meet with AMP Team Mentor to discuss progress and clarify next steps]
12	23	11/14, T	Advanced Queries	Chapter 12		
	24	11/16, TH	LAB 11: Advanced Queries			Project Progress Report due Friday, 11/18, 11:59 PM (Report project progress)
13	25	11/21, T	Mining Text to Find Meaningful Data	Chapter 13	Assignment 4: Modifying Data Working with Dates and Times	
	26	11/23	Thanksgiving Break		No Work Due	No Work Due
14	26	11/28, T	Views Maintaining the database Telling the Story Behind Your Data	Chapters 15, 17, 18		
	27	11/30, TH	Work on Project			Final Project Standups Due by Friday 12/2, 11:59PM
15	26	12/5, T	Final work on Project Course Wrap-up	Chapters 6-13, 15-18	LAST DAY OF CLASSES	- Project Report due Monday, 12/12, 11:59 PM (Report project work) - Project Reflection due Wednesday, 12/14, 11:59 PM (Reflect on your Project experience)

All sections meet together on Tuesdays and Thursdays a week for 50-minute lectures. Each section meets separately on Fridays for 50-minute discussions / recitations.