CS157a Fall 2025 section 02 Home Page/Syllabus

Introduction to Database Management Systems

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Office Hours: TuTh 5:00PM - 6:00PM
Class Meets:
Sec TuTh 6:00PM - 7:15PM, MacQuarrie Hall 225

Prerequisites

To take this class you must have taken:
CS146
with a grade of C- or better.

Texts and Links

Required Texts:	Database Systems: The Complete Book. Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom
Online References and Other Links:	MySQL. Postgres. Sqlite. Oracle. DB2. MySQL online. DBeaver.

Tools Needed:

Install MySQL and DBeaver
Follow these steps to install and verify both tools on your system:

- **MySQL:**
  - Download MySQL Community Server from dev.mysql.com/downloads/mysql/ (Pick up your platform file)
  - Run the installer, choose “Developer Default,” set root password (e.g., `cs157apass`).
  - Verify: Open Command Prompt, run `mysql -u root -p`, enter password, see `mysql>` prompt.
- **DBeaver:**
  - Download DBeaver Community Edition from dbeaver.io/download/ (Pick up your platform file).
  - Run the installer, accept defaults.
  - Connect to MySQL: Open DBeaver, add new connection (MySQL), use root/`cs157apass`, test connection.

Description

From the Catalog: Current, classical database systems. Entity-relationship and enhanced entity models.
Relational model, algebra, calculus. Current, emerging SQL standard. Embedded,
Dynamic SQL. Application perspective on transactions and security.
Interactive and programmatic interfaces to database systems. Application programming project using commercial database system. .

Course Learning Outcomes (CLOs)

By the end of this course, a student should be able to:

CLO1 -- Explain basic database concepts, including the structure and operations of the relational data model

CLO2 -- Identify key components of database management systems and their functions at a high level

CLO3 -- Conduct normalization to decompose relations into 3NF or BCNF when that removes anomalies

CLO4 -- Use SQL as a data definition language (DDL) to create and alter databases, tables, views, and indexes

CLO5 -- Use SQL as a data manipulation language (DML) for querying and modifying databases

CLO6 -- Define and use constraints and triggers in SQL

CLO7 -- Describe the concept of transactions

CLO8 -- Build a simple database application in a high-level programming language (e.g., Java and Python) that interacts with a relational database system at the back-end

CLO9 -- Describe one of the well-known data distribution technologies such as replication and partitioning

Course Schedule

Below is a tentative time table for what we'll do things this quarter:

Week 1:	Introduction of databases, Relational model
Week 2:	query-relational DB, Relational Algebra
Week 3:	Introduction to SQL, Subqueries
Week 4:	Data-modification, Relation design, Function depends
Week 5:	Function depends, BCNF
Week 6:	Multivalued dependence, BCNF and 4NF
Week 7:	UML data modeling, UML to relations
Week 8:	Review, Midterm
Week 9:	Index, Constraints
Week 10:	Triggers, Transactions
Week 11:	Views,Materialized-view
Week 12:	Authorization
Week 13:	Basic recursive

Week 14:	Nonlinear mutual recursion
Week 15:	JDBC
Week 16:	Semi-structured databases, XML, Review
	The final will be Tue, December 16 5:30-7:30 PM

Grading

HWs and Quizzes	50%
Midterm	20%
Final	30%
Total	100%

Grades will be calculated in the following manner: The person or persons with the highest aggregate score will receive an A+. All scores will be scaled with A+, for example, highest score is 85, then it will be scalled by 1.17647 (85*1.17647 = 99.99995).for all scores. See detail:

Grade	Range
A+	96+
A	93 to 95.99%
A-	90 to 92.99%
B+	87 to 89.99%
B	83 to 86.99%
B-	80 to 82.99%
C+	77 to 79.99%
C	73 to 76.99%
C-	70 to 72.99%
D	60 to 69.99%
F	Below 60

If you do better than an A- in this class and want me to write you a letter of recommendation, I will generally be willing provided you ask me within two years of taking my course. Be advised that I write better letters if I know you to some degree.

Course Requirements, Homework, Quiz Info, and In-class exercises

This semester we will have homeworks, weekly quizzes, and weekly in-class exercises.

Classroom Protocol

I will start lecturing close to the official start time for this class modulo getting tangled up in any audio/visual presentation tools I am using. Once I start lecturing, please refrain from talking to each other, answering your cell phone, etc. If something I am talking about is unclear to you, feel free to ask a question about it. Typically, on practice tests days, you will get to work in groups, and in so doing, turn your desks facing each other, etc. Please return your desks back to the way they were at the end of class. This class has an online class discussion board which can be used to post questions relating to the homework and tests. Please keep discussions on this board

civil. This board will be moderated. Class and discussion board participation, although not a component of your grade, will be considered if you ask me to write you a letter of recommendation.

Exams

The midterm will be during class time on: Oct 15.

The final will be: Wed, December 10 3:15-5:15 PM

All exams are closed book, closed notes and in this classroom. You will be allowed only the test and your pen or pencil on your desk during these exams. The final will cover material from the whole semester although there will be an emphasis on material after the last midterm. No make ups will be given. The final exam may be scaled to replace a midterm grade if it was missed under provably legitimate circumstances. These exams will test whether or not you have mastered the material both presented in class or assigned as homework during the quarter. My exams usually consist of a series of essay style questions. I try to avoid making tricky problems. The week before each exam I will give out a list of problems representative of the level of difficulty of problems the student will be expected to answer on the exam. Any disputes concerning grades on exams should be directed to me, Professor Pollett.

Regrades

If you believe an error was made in the grading of your program or exam, you may request **in person** a regrade from me, during my office hours. **I do not accept e-mail requests for regrades.** A request for a regrade must be made no more than a week after the homework or a midterm is returned. If you cannot find me before the end of the semester and you would like to request a regrade of your final, you may see me **in person** at the start of the immediately following semester.

University Policies and Procedures

SJSU adheres to required safety measures from the California Department of Public Health and the Santa Clara County Public Health Department. Please refer to our SJSU Health Advisories website for the latest information and updates.

Per University Policy S16-9, relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on Syllabus Information web page (https://www.sjsu.edu/curriculum/courses/syllabus-info.php). Make sure to visit this page to review and be aware of these university policies and resources. Below are some brief comments on some of these policies as they pertain to this class.

Academic Integrity

For this class, you should obviously not cheat on tests. For homeworks, you should not discuss or share code or problem solutions between groups! At a minimum a 0 on the assignment or test will be given. Faculty members are required to report all infractions to the Office of Student Conduct and Ethical Development.

Accommodations

If you need a classroom accommodation for this class, and have registered with the Accessible Education Center, please come see me earlier rather than later in the semester to give me a heads up on how to be of assistance.