

San José State University
College of Science, Computer Science Department CS 157A -06:
Introduction to Database Management Systems, Fall 2025

Course and Contact Information

Instructor: Professor Takoua El Bejaoui

Email: takoua.bejaoui@sjsu.edu

Office Hours: W (1pm - 2pm) (Virtual)

Class Times

and Locations: Lecture Section 06: Tuesday and Thursday 10:30 AM-11:45 AM (Eng 403)

Prerequisites: To take this class you must have taken: CS146 with a grade of C- or better.; or graduate standing or instructor consent.

Course Description

In this course, we will consider how databases are designed and deployed on Data Base Management Systems (DBMSs). We will learn about the three schema architectures used for databases, data independence, and client-server architectures. We will describe models for how data should be organized heuristically in a database using entity relationship (ER), extended entity relationship (EER), and UML diagrams. We will learn about what the relational model is and about relational database constraints. Then we will discuss how to translate EER diagrams into relations which could then be created as tables in a DBMS. We will see techniques to write relational algebra queries and to be able to predict given a database instance what such a query will return. SQL and enough real world DBMSs will be introduced to allow us to be able to create a database in such a system and modify/alter them. SQL operations for inserting rows and updating these rows will be described. We will learn the SQL need to cause knows to be changed on a triggering event. We will learn how to write simple transactions using JDBC. Finally, we will discuss how to analyse the relations we might get from ER modeling followed by conversion to the relational model with respect to various normal forms to be able to judge how good they are.

For the official catalog description, please visit the [online catalog](#).

Course Materials

Course materials such as the syllabus, assignments, lecture notes... will be available on our class Canvas site. Students will also use Canvas, coupled with zybooks and zylabs, to submit assignments and exams. Students are responsible for regularly checking Canvas to learn of any updates and announcements.

Planned Course Learning Outcomes (PCLO)

Upon successful completion of this course, students should be able to:

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.

Optional Textbook

- [Database Systems: The Complete Book](#). Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom

Course Mechanics

- **Laptops**
 - You will need a laptop/desktop with internet access (running OSX, Windows, or some version of UNIX) to all classes, labs, and exams.
 - You can borrow laptops through the [MLK Library](#) or through [ATE](#).
- **Online Discussion Board or Inbox (Canvas)**
 - You can ask and answer questions online via Canvas's discussion post or inbox/messaging app.
- **Required subscription to zybooks/zylabs** - which will be given through Canvas
 - **zyBook Pricing Information:**
 - zyBook subscriptions start at \$64 per student.
 - A student's subscription is made available two weeks before the term starts and expires two weeks after the term ends.
 - Students can extend their subscriptions for \$25 for one year. They cannot use the zyBook for another course - it's just for personal use.
 - Students can save a zyBook as a searchable PDF on their own devices (or print).

Full Refund/One Free Retake

- If a student has to retake the same course using the same topic zyBook, they can email support@zybooks.com and we will provide a one-time free subscription.
- If a student drops out of the class, they can find the *Request a refund* button on the *My subscription* tab in their zyBook (applies to direct purchases).

Student Can't Pay Right Away

- Students can subscribe to a zyBook and pay \$0. They will have access to Chapter 1. This is helpful if they are on a waitlist or they're not sure if they will stay in the class. The instructor will not see the student in the class zyBook roster until the subscription is purchased. But, all activity is recorded and time-stamped.
- Students can ask for a temporary subscription for up to 30 days if they need time to pay for their zyBook. On the Payment page, they would click *Have payment questions?* Then, *What if I can't pay right away?* See [Does zyBooks offer temporary subscriptions?](#)

Discounts/Bookstore

- If students need to use the same topic zyBook for another course (CS 1 uses the Java zyBook, CS 2 uses a combination of the Java and Data Structures zyBooks, for ex.), our system detects they are a repeat user of the same topic zyBook and give them an automatic 50% discount off of their subscription. This discount is available for up to one year after the previous zyBook expires (applies to direct purchases).
- If a student must purchase their zyBook through the bookstore (financial aid), we provide the bookstore access keys at a 10% discount and bill the bookstore after the add/drop date passes for the number of keys sold.

Help/FAQ article: [Payment: Cost, financial aid, refunds, discounts, and more](#)

For students: [Can I get a refund if I drop my class, or I'm waitlisted and don't get in?](#)

How to request a temporary subscription to a zyBook

How long do subscriptions last? / Can I extend? / Can I save or print?

Grading Information

1. All examinations must be taken in order to receive a passing grade.
2. No make-up examinations will be granted without a valid reason and proof.
3. One week grace period after assignment submissions' deadlines will be accepted.
4. Homework assignments will be posted to Canvas and due on Canvas (using Canvas assignment submission) by the announced due dates on Canvas. Please remember to check Canvas regularly.
5. Homework assignments are individual and group effort assignments. Students are encouraged to have intellectual discussions about the homework problems. However, all students must prepare and submit their own solutions to the homework problems which reflect their understanding and problem-solving methodologies. Any form of cheating or plagiarism such as copied/shared solutions or code will not be tolerated. For a team-effort assignment, all members of a team will share the same score. Therefore, please make sure to be professional, work effectively, and contribute equally to the team-effort assignments so that every team member has the opportunity to learn and improve themselves.

Grading

Homework Assignments:	30 %
Midterm Exam 1:	20 %
Quizzes:	20%
Final Exam:	30 %

Total:	100 %
--------	-------

Letter Grade Determination

Total $\geq 97\%$	A+
Total $\geq 93\%$	A
Total $\geq 90\%$	A-
Total $\geq 87\%$	B+
Total $\geq 83\%$	B
Total $\geq 80\%$	B-
Total $\geq 77\%$	C+
Total $\geq 73\%$	C
Total $\geq 70\%$	C-
Total $\geq 67\%$	D+
Total $\geq 63\%$	D
Total $\geq 60\%$	D-
Total $< 60\%$	F

- All scores are listed in Canvas after grading completed and you should check your scores after they are posted.
- See [University Policy F13-1](#) for more details.
- You must earn at least a C- (70%) to be eligible to take CS 157B.

SJSU & CS Department Policies

- Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at <<http://www.sjsu.edu/gup/syllabusinfo/>>.
- CS Department and SJSU policies are also posted at <<https://www.sjsu.edu/cs/programs/mscs/policies.php>>.

BSCS Program Outcomes Supported by this Course

- (a) An ability to apply knowledge of computing and mathematics to solve problems
- (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- (c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- (d) An ability to use current techniques, skills, and tools necessary for computing practice
- (e) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices

Additional Information

- **General Tutoring**
 - <https://www.sjsu.edu/science-ssc/student-resources/tutoring/>

CS 157A-06: Introduction to Database Management Systems, Fall 2025
Approximate Course Schedule

Week/Dates	Discussions Topics/Activities
Week 1 Th 08/21	Welcome to CS157A-06! Class Orientation, Syllabus Discussion
Week 2 T 08/26 & Th 08/28	Introduction to Database Management Systems
Week 3 T 09/02 & Th 09/04	Relational Model SQL
Week 4 T 09/09 & Th 09/11	Algebraic query languages, relational constraints
Week 5 T 09/16 & Th 09/18	Design of Databases, Functional Dependencies
Week 6 T 09/23 & Th 09/25	Decompositions, 3NF
Week 7 T 09/30 & Th 10/02	ER model, Weak Entity Sets
Week 8 T 10/07 & Th 10/09	Review and Exam 1
Week 9 T 10/14 & Th 10/16	ER to Relational Mapping, UML and ODL modeling and Mapping
Week 10 T 10/21 & Th 10/23	Relational Algebra and its extensions, Datalog
Week 11 T 10/28 & Th 10/30	Writing Queries in SQL, Constraints and triggers, Views and Indexes
Week 12 T 11/04 & Th 11/06	Indexes and SQL in a Server Environment
Week 13 T 11/11 & Th 11/13	SQL Examples, JDBC
Week 14 T 11/18 & Th 11/20	Semi-Structured Databases, XML
Week 15 T 11/25 & Th 11/27	SQL Examples (Thanksgiving)
Week 16 T 12/02 & Th 12/04	TBA Lecturer Visit, Review
Final Exam Days December 10-12 and December 15-16, 2025	Final exam will be held on Th 12/11/25 at 10:45AM - 12:45PM.