SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to Database Management Systems

CS 157A

Fall 2025 Section 01 In Person 3 Unit(s) 08/20/2025 to 12/08/2025 Modified 08/27/2025

Contact Information

Instructor: Ethel Tshukudu

- Class Time: Tuesday and Thursday, 16:30 - 17:45.
  - Lecture Room: Science Building 164
- Office Hours: Tuesday and Thursday, 3:00 p.m - 4:00 p.m at MH(MacQuarrie Hall) 211
- Email: ethel.tshukudu@sjsu.edu

Feel free to reach out to me via email or drop by during office hours if you need any help. I'm here to support you!

Course Description and Requisites

Relational data model. Relational algebra. Standard SQL. Design theory. Conceptual data modeling. Integrity constraints and triggers. Views and indexes. Transactions. Distributed data management. Interactive and programmatic interfaces to database systems. Application programming project using a prominent database system.

Prerequisite(s): CS 146 (with a grade of "C-" or better); Computer Science, Applied and Computational Math, Forensic Science: Digital Evidence, Software Engineering, or Data Science majors only; or instructor consent.

Letter Graded

Classroom Protocols

Commitment to Equity

Our classroom is a space where everyone is respected, regardless of background, identity, or experience level. Diversity in thought, culture, and perspective enriches our learning environment. Everyone's voice matters.

Actively listen to others, and contribute constructively. Encourage and support your peers, especially those who might need a little extra help or confidence to participate.

Academic Integrity

Your work must be your own. This means all code, assignments, and projects should be created and completed independently unless group or pair work is explicitly allowed.

While collaboration on concepts and discussions to support learning is encouraged, all individual assignments must represent your own work. Submitting solutions copied from another student, generated by AI, or taken from other sources without acknowledgment is considered plagiarism and a violation of SJSU's Academic Integrity Policy. In assignments where the use of AI tools is explicitly permitted, you must clearly cite them. Students may be asked to explain their work to demonstrate understanding. I recognize it may be tempting to rely on AI tools, but genuine learning, especially the development of higher-order thinking skills, is more important than ever in this era of AI. Unless otherwise specified, all work must be completed independently or within the boundaries of an assigned group project.

Failure to do so may result in a penalty, including a reduction in grade. If plagiarism is detected, you will receive a warning, and your grade for the assignment may be reduced or given a zero, depending on the severity. Continued plagiarism may result in more serious consequences, including failure of the course and reporting to university administration.

Exams and Assessments

All exams and assessments must be taken at the scheduled time. **Make-ups are granted only for documented, extenuating circumstances**, consistent with SJSU policy. If you know of a future conflict, notify me in writing within the first two weeks of the semester or as soon as you become aware. For unforeseen emergencies, notify me as soon as circumstances permit. More here: https://www.sjsu.edu/senate/docs/S22-2.pdf

Assignments(Homework and Project) submitted up to 48 hours late will receive a 10% deduction per day (maximum 20%); after 48 hours, submissions will not be accepted. This rule only applies only to Homework and Project Stages. Participation, Poll Everywhere, and Zybooks Exercises are time-sensitive activities that must be completed by the scheduled deadline and therefore do not allow late submissions, except in cases of documented emergencies. Exams (Midterm and Final) must be taken at the scheduled time, with makeup exams granted only through prior arrangement or in cases of documented emergencies.

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Goals

- **Explain** the purpose of database systems, user roles, and common applications.
- **Apply** the relational model and relational algebra to organize and manipulate data.
- **Analyze** functional dependencies and **apply** normalization algorithms to design efficient relational schemas.
- **Describe** database architectures, system components, and characteristics of prominent DBMSs such as Oracle, MySQL, and SQL Server.
- **Formulate** queries and data manipulation statements using Standard SQL.
- **Implement** database interaction through programming interfaces, integrity constraints, triggers, views, indexes, and transactions, culminating in an application project using a prominent DBMS.
- **Develop** a simple database application that demonstrates programmatic interaction between a relational database and an application environment

Course Learning Outcomes (CLOs)

Upon successful completion of this course, a student will be able to:

- Utilize theoretical and practical knowledge to create database applications through DBMS and the SQL programming language.
- Proficiently employ Entity Relationship Diagrams to represent conceptual schemas.
- Recognize functional dependencies and apply normalization algorithms.
- Implement Data Definition Language to outline database schemas.
- Construct procedures for data retrieval using the Data Manipulation Language, encompassing schema management, indexing, normalization, views, triggers, and constraints.
- Formulate SQL commands for tasks such as database and table creation, as well as the insertion, updating, deletion, and retrieval of data within a standard database management system.
- Develop data retrieval processes using Relational Algebra principles.
- Write simple transactions that integrate a relational database with an application programming language

Course Materials

Required Text Book:

In this course, we will use the following zybooks textbook:

1. Click any zyBooks assignment link in your CANVAS (Do not go to the zyBooks website and create a new account)
2. Subscribe

A subscription is **$89**. You may begin subscribing on Aug 07, 2025 and the cutoff to subscribe is Dec 02, 2025. Subscriptions will last until Dec 31, 2025.

Optional Text Book:

Textbook This course does not have a required textbook. The lecture notes contain all the required materials.

References

- Hector G Molina, Jeffrey D Ullman and Jennifer Widom, Database Systems – The complete Book, 2nd or 3rd edition, Pearson Education

Available Software and useful Links

- MySQL WorkBench at https://dev.mysql.com/downloads/
- MySQL server at https://dev.mysql.com/downloads/
- MySQL Connectors - JDBC Driver for MySQL (Connector/J) at http://www.mysql.com/products/connector/

Bringing a laptop is recommended for in-class participation exercises and Poll Everywhere activities.

✔ Grading Information

Category Weight Notes

Category	Weight	Notes
Participation Exercises	5%	class exercises during lecturers
Poll everywhere	5%	during lectures
Reading exercises and Labs	10%	Zybooks exercises and Labs
Homework	10%	Homework
Midterm term exam	20%	Covers first half of the course lecturers
Project	25%	Delivered in stages
Final Exam	25%	Covers all lectures

Grading Scale

Range	Grade
97-100	A+
93-96	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
63-66	D
60-62	D-
Below 60	F

University Policies

Per University Policy S16-9 (PDF) (http://www.sjsu.edu/senate/docs/S16-9.pdf), 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 the Syllabus Information (https://www.sjsu.edu/curriculum/courses/syllabus-info.php) web page. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

Tentative Schedule

The schedule outlined below is subject to change. Adjustments may be made to better align with class progress, project needs, or unforeseen circumstances.

Week	Topics
1(22 August)	Course Introduction, Syllabus, Introduction to Database
2(25-29 August)	Introduction to Database, DBMS installation MySQL server and Workbench, Introduction to the relational databases and relational model and SQL basics and programming
3(1-5 Sept)	Relational Databases, SQL Programming, more complex SQL queries, project team assignment and requirements
4(8-12 Sept)	Relational Database Design, Entity Relationship Model, MySQL Workbench
5(15-19 Sept)	Relational Model, SQL Data Definition, XML, Convert ERD to Schemas, SQL Programming
6(22-26 Sept)	Logical Database Model concepts (relations, schemas, keys, constraints, SQL DDL), projects part 1 submissions and updates
7(29 Sept-3 Oct)	Midterm Exam
8(6-10 Oct)	Schema Design, Normalization, functional dependencies
9(13-17 Oct)	SQL Programming, Relational Algebra
10(20-24 Oct)	JDBC, Views and Indexes ; Constraints & Triggers
11(27-31 Oct)	JDBC; NoSQL, Graph Dbs
12(3-7 Nov)	Database Achitecture, projects part 2 submissions and updates
13(10-14 Nov)	Vetans Day Holiday Tuesday, Distributed Data Management
14(17-21 Nov)	Final Project Presentations and Discussions
15(24-28 Nov)	Transactions, Concurrency, and Thanksgiving Holiday (Thursday)
16(1-5 Dec)	TBD
Exams	https://www.sjsu.edu/classes/final-exam-schedule/fall-2025.php