SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to Database Management Systems Section 01

CS 157A

Spring 2023   3 Unit(s)   01/25/2023 to 05/15/2023   Modified 01/24/2023

👤 Contact Information

Instructor:	Jahan Ghofraniha
Office Location:	ENG 281
Email:	jahan.ghofraniha@sjsu.edu
Office Hours:	M-W 9:30 – 10:15 am or through zoom by appointments Zoom link: https://sjsu.zoom.us/j/6478341917
Class Days/Time:	M-W 1:30 – 2:45 pm
Classroom:	BBC 204
Prerequisites:	CS146 (with a grade of "C-" or better) or instructor consent. Computer Science and Software Engineering Majors only
Format	in-person

🖥 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

- Students are encouraged to ask questions in the class.
- Each student is required to engage in classroom activities, submit assignments and reports on time, and take exams and tests on time.
- Major exams in this class may be video recorded to ensure academic integrity. The recordings will only be viewed if there is an issue to be addressed. Under no circumstances will the recordings be publicly released.

▤ 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 Learning Outcomes (CLOs)

Course Learning Outcomes (CLO)

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

- Apply theoretical knowledge and practical skills to develop database applications using DBMS and SQL language
- Effectively use the Entity Relationship Diagram for the representation of conceptual schemas.
- Identify functional dependencies and apply normalization algorithms.
- Use Data Definition Language to define database schemas.
- Construct data retrieval procedures using the Data Manipulation Language (schema, index, normalization, view, trigger, constraints).
- Write SQL commands to create databases, create tables, insert/update/delete/retrieve rows in a common database management system.
- Develop data retrieval procedures using Relational Algebra.

📘 Course Materials

Required Texts/Readings
Textbooks:

Databases A Beginner's Guide 1st Edition

by Andy Oppel (Author)

ISBN-13: 978-0071608466

ISBN-10: 007160846X

References:

Database System Concepts 7th Edition

by Abraham Silberschatz (Author), Henry Korth (Author), S. Sudarshan (Author)

ISBN-13: 978-1260084504
ISBN-10: 1260084507

Other Readings

Other readings will be occasionally assigned from articles and journals. The links will be provided on Canvas.

☰ Course Requirements and Assignments

All students who need to add this class are required to bring the evidence for the pre-requisites in the first week of class.

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf. Note that University policy F15-12 at http://www.sjsu.edu/senate/docs/F15-12.pdf states that "Attendance shall not be used as a criterion for grading."…

"Students are expected to attend all meetings for the courses in which they are enrolled as they are responsible for material discussed therein, and active participation is frequently essential to ensure maximum benefit to all class members. In some cases, attendance is fundamental to course objectives; for example, students may be required to interact with others in the class. Attendance is the responsibility of the student."… "Participation may be used as a criterion for grading when the parameters and their evaluation are clearly defined in the course syllabus and the percentage of the overall grade is stated."

Assignments:

The assignments are to be submitted on time. No late assignments will be accepted after the due date.

Exams:

- The exams are based on lectures, homework/lab assignments, and reading materials covered before the exam's date.
- Absolutely NO items may be shared during the exams, including books, notes, and calculators.
- Absolutely NO usage of cell phones during exams. Cell Phones must be off or in silent mode and not within your reach.

Makeup exams will only be granted in case of documented medical emergency with an advanced notice to the instructor. If a student misses an exam without a legitimate excuse, a grade of zero will be recorded.

✔ Grading Information

Your individual grade will be weighted as follows:

- Quiz   15%
- Weekly homework   20%
- Midterm exam   25%
- Final project   15%
- Final Exam   25%

Total   100%

A= 100-93; A- = 90-92.99; B+ = 88-89.99; B= 83-87.99; B- = 80-82.99; C+ = 78-79.99; C= 73-77.99; C- = 70-72.99; D+ = 68-69.99; D = 63-67.99; D- = 60-62.99; F= <60.

Passage of the Writing Skills Test (WST) or ENGL/LLD 100A with a C or better (C- not accepted), and completion of Core General Education are prerequisite to all SJSU Studies courses. Completion of, or co-registration in, 100W is strongly recommended. A minimum aggregate GPA of 2.0 in GE Areas R, S, & V shall be required of all students.

🏛 University Policies

Per University Policy S16-9 (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 Syllabus Information web page (https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (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.

📅 Course Schedule

The schedule is subject to change with fair notice in class and through Canvas announcement.

Week	Topics, Readings, Assignments, Deadlines
1	Introduction, class policy and syllabus
2	Introduction to databases
	Relational Database, hw1
3	Design objectives
	Terminology, hw2
4	Design Process (conceptual review/database life cycle)
	Case study, hw3
5	Looking at business process/business rules (Intro to SQL)
	Analyzing current database (SQL implementation), hw4
6	Table structures-SQL implementation
	Table structures-SQL implementation
7	Keys

Week	Topics, Readings, Assignments, Deadlines
	Table Relationships, hw5
8	Design using Normalization
	Normalization, hw 6
9	Midterm Review (final project announcement)
	Midterm exam (03/22/2023)
10	Spring Break (3/27-3/31)
	Spring Break (3/27-3/31)
11	Physical Database design
	Physical Database design, hw 7
12	Database security
	Database security
13	Deploying databases
	Deploying databases
14	No SQL databases (Mongo DB implementation)
	No SQL databases (Mongo DB implementation)
15	Final project presentations/Final Review
	Final project presentations/Final Review
16	Final project presentations/Final Review
	Final project presentations/Final Review- Final Project Report due

Week	Topics, Readings, Assignments, Deadlines
Final Exam	**Tuesday May 23, 2023, 12:15-2:30 PM**

Week	Topics, Readings, Assignments, Deadlines