San José State University
Computer Science Department
CS 157A, Introduction to Database Management Systems, Section 01, Fall 2022

Course and Contact Information

Instructor:	Jahan Ghofraniha
Office Location:	ENG 281
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Office Hours:	M-W 10:15 – 11:00 am or through zoom by appointments Zoom link: https://sjsu.zoom.us/j/6478341917
Class Days/Time:	M-W 9:00 – 10:15 am
Classroom:	WSQ 109
Prerequisites:	CS146 (with a grade of "C-" or better) or instructor consent. Computer Science and Software Engineering Majors only
Course Format	in-person

Course Description

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.

Course Overview

This course is an introduction to database design and implementation. Covers relational algebra, requirements, architecture, design, implementation, testing, and maintenance phase activities in a team based project.

This class will cover the key concepts and best practices of the software engineering discipline. Students will learn about the different phases of the classic software engineering lifecycle and the activities that software

engineers perform during each of these phases. This will include project management, software requirements specification, architecture, design, implementation best practices, software testing, and maintenance activities.

Students will also participate in a team-based software engineering project that will span the entire software lifecycle.

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.

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 Policy

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.

Classroom Protocol

All students are expected to be on time, each team will upload their weekly update in a written format on Canvas. The second lecture is used to teach content related to software engineering topics.

University 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/"

CS157 A-01 Software engineering, Fall 2022, Course Schedule

List the agenda for the semester including when and where the final exam will be held. Indicate the schedule is subject to change with fair notice and how the notice will be made available.

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
	Table Relationships, hw5
8	Design using Normalization
	Normalization, hw 6
9	Data and Process Modelling
	Data and Process Modelling
10	Midterm Review (final project announcement)
	Midterm exam (10/26/22)
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)
	Final project presentations

Week	Topics, Readings, Assignments, Deadlines
15	Final project presentations
16	Final project presentations
	Final project presentations
Final Project Report Final Exam	Tuesday Dec 13th, 2022, 7:15-9:30 AM