

**San José State University**  
**Computer Science Department**  
**CS257, Database Systems Principles, Section 1, Fall 2021**

**Course and Contact Information**

<b>Instructor:</b>	Fain (Frank) Butt
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<b>Office Hours:</b>	<b>MW 8:45 PM - 10:00 PM (by appointment)</b>
<b>Class Days/Time:</b>	MW 6:00 - 7:15 PM
<b>Classroom:</b>	Zoom
<b>Prerequisites:</b>	CS157B or previous RDBMS + SQL knowledge

**Course Format**

All your homework assignments and programming projects must be able to compile and run before submission. Otherwise you will not earn many points if we can't verify your results. You are expected to spend 15-20 hours a week on homework or programming assignment.

**Faculty Web Page and MYSJSU Messaging**

Course syllabus and the rest of the course information will be published via Canvas. You are responsible for regularly checking with the messaging system through MySJSU and Canvas to learn of any updates.

**Course Description**

This is an advanced database class. This class will cover a broad range of topics "inside" the database system. Topics include data storage & representation, index structures, query execution, query compiler, system recovery techniques, concurrency control, and transaction management. There will be an extensive programming project using C/C++.

This class focuses specifically on database implementation and DBMS application processing.

The DBMS application processing section is divided into 2 parts:

- Part 1 Programming Interfaces for a commercial DBMS
- Part 2 Exploitation of SQL Functions

## Course Learning Outcomes (CLO)

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

1. CLO 1 – Use several programming interfaces such as Embedded SQL and JDBC.
2. CLO 2 – Understand the main differences between dynamic and static SQL.
3. CLO 3 – Understand how the data is formatted and stored on the disk.
4. CLO 4 – Understand how an SQL statement is being processed inside the database.
5. CLO 5 – Understand different indexing schemes and their storage implementation.
6. CLO 6 – Understand how current transactions are being processed and synchronized.
7. CLO 7 – Understand how to backup and recover data using different logging methods.
8. CLO 8 – Learn to implement a light-weight relational database with above concepts.

## Textbook

Database Systems - The Complete Book, 2<sup>nd</sup> Ed. (ISBN 0-13-187325-3)

## Other Readings [Optional]

None

## Other equipment / material requirements (include if applicable)

Additional Lecture Slides and class material will be provided

## Course Requirements and Assignments

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](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

There will be one exam, one project, and several homework and quizzes. All the exams and quizzes will be close book unless noted. There will be no personal digital devices allowed during the quizzes and exam besides the device connected to Canvas. I strongly suggest that you attend each class and take good notes during the semester. There will be **NO** make-up exams and quizzes.

All the homework, programming assignments, and related documentations must be handed in electronically. Programs that are handed in after the due date will not be accepted. Additional information about each project will be given in separate handouts. For your project, we will compile and grade your programs using the gcc compiler on Windows and on Mac. Your program needs to be able to compile and execute before you turned it in.

NOTE that [University policy F69-24](http://www.sjsu.edu/senate/docs/F69-24.pdf) at <http://www.sjsu.edu/senate/docs/F69-24.pdf> states that “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

### Grading Policy

Final Exam	400 points	40%
HW & Quizzes	350 points	35%
Project	250 points	25%
Total	1000 points	100%

We do not use the traditional grading scale for grade assignment in this class. The final "letter" grade will be determined from a curve at the end of the semester.

Note that “All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades.” See [University Policy F13-1](http://www.sjsu.edu/senate/docs/F13-1.pdf) at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

### Classroom Protocol

There will be no specific lecture notes given out. Therefore, it is to your best interests to attend class and take good notes. You must turn off any cell phone ringer at the beginning of each class when your mic is on.

### University Policies

#### 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](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>”

### CS257, Database Systems Principles, Section 1, Fall 2021, Course Schedule (subject to change)

Event	Date	Time	Topics, Readings, Assignments, Deadlines
Week 1	08/23/2021	Sec 1: 6:00–7:15PM	Introduction and Overview, Chapter 1; Chapter 5; HW#1 assigned
Week 2	08/30/2021	“	Review SQL1, SQL2;
Week 3	09/06/2021	“	Labor Day; SQL Journey; HW#2 assigned (Embedded static SQL)
Week 4	09/13/2021	“	Chapter 13;
Week 5	09/20/2021	“	Chapter 13, Project Part 1 Kickoff;
Week 6	09/27/2021	“	Quiz #1; Chapter 14;
Week 7	10/04/2021	“	Chapter 14;
Week 8	10/11/2021	“	Chapter 15;
Week 9	10/18/2021	“	Chapter 15; Project Part 2 Kickoff;
Week 10	10/25/2021	“	Chapter 16; Query Optimization;

<b>Event</b>	<b>Date</b>	<b>Time</b>	<b>Topics, Readings, Assignments, Deadlines</b>
Week 11	11/01/2021	“	Quiz Review; Chapter 16;
Week 12	11/08/2021	“	Chapter 17;
Week 13	11/15/2021	“	Chapter 17, Project Part 3 Kickoff;
Week 14	11/22/2021	“	Quiz #2; Thanksgiving
Week 15	11/29/2021	“	Quiz and Final Exam Review; Chapter 18;
Last Day	12/06/2021	“	Chapter 18;
Final Exam	12/08/2021	Sec 1: 5:15–7:30PM	Covers review materials, Chapter 13-18 of textbook, and assignments