# San José State University Computer Science Department CS267 – Topics in Database Systems, Sec 2, Fall 2022

## Course and Contact Information

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| Instructor: | Fain (Frank) Butt |
| Office Location: | DH282, TBD |
| Telephone: | (408) 924-5060 |
| Email: | Frank.Butt@sjsu.edu |
| Office Hours: | MW 7:15 PM - 8:30 PM (by appointment) |
| Class Days/Time: | MW 6:00 - 7:15 PM |
| Classroom: | Science Building 311 |
| Prerequisites: | CS 157B and Graduate standing |

## Course Format

## This is an in-person class.

## All your HW assignments and programming projects must be able to compile and run before submission. Otherwise you will not earn many points if I can’t verify your results. You are expected to spend ~10-15 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. Make sure you use your preferred email address in Canvas.

**Course Description**

Computing topics of current interest in industrial practice.  This section focuses on query optimization and performance tuning techniques. We will use DB2 for z/OS as an example.  We will also cover internal implementation of a RDBMS and database application tuning.

The Query Optimization is divided into four parts:

* Fundamental Concepts for Query Optimization
* Understanding Access Path
* Optimizer Statistics and Access Path Selection
* Database Performance Tuning

## Course Learning Outcomes (CLO)

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

### CLO 1 - Understand the mechanism of query optimization and how the DB2 optimizer functions.

### CLO 2 - Understand access methods.

### CLO 3 - Understand optimizer statistics and how statistics affect access path.

### CLO 4 - Understand the performance issues and know how to manage them.

### CLO 5 - Tune application performance and SQL performance by various means.

### CLO 6 - Understand DBMS internals such as concurrency, scheduling, and distributed processing.

### Textbook

### *Optional* Database Systems - The Complete Book, 2nd Ed. (ISBN 0-13-187325-3)

### Other Readings

TBD

## 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, several programming assignments, several homework and quizzes. All the exams and quizzes will be open notes only. There will be no laptops, or any personal digital devices allowed. 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 labs, 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 programming assignments, we will compile and grade your programs using gcc and/or Java compiler for JDBC project. 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 Information

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. 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 some presentation PDFs given outside of the textbook. However there will be no textbook related lecture notes given out. It is your best interests to attend class and take good notes. You must turn off any cell phone ringer at the beginning of each class!

Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.

## 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/”

**CS267 – Topics in Database Systems, Sec 2, Fall 2022, Course Schedule (subject to change)**

| Event | Date | Class Time | Topics, Readings, Assignments, Deadlines |
| --- | --- | --- | --- |
| Week 1 | 08/22/2022 | Sec2: 6:00-7:15PM | Introduction and Overview, SQL Review Part 1; |
| Week 2 | 08/29/2022 | “ | SQL Review Part 2; Static vs Dynamic SQL; |
| Week 3 | 09/05/2022 | “ | Labor Day (no class on Mon); Application Interfaces; |
| Week 4 | 09/12/2022 | “ | Fundamental Concepts for Query Optimization (Start) |
| Week 5 | 09/19/2022 | “ | Fundamental Concepts for Query Optimization (End); |
| Week 6 | 09/26/2022 | “ | Quiz #1; Understanding Access Path (Start) |
| Week 7 | 10/03/2022 | “ | Understanding Access Path (End) |
| Week 8 | 10/03/2022 | “ | Optimizer Statistics and Access Path Selection (Start) |
| Week 9 | 10/03/2022 | “ | Optimizer Statistics and Access Path Selection (End) |
| Week 10 | 10/03/2022 | “ | Database Performance Tuning (Start) |
| Week 11 | 10/03/2022 | “ | Database Performance Tuning (End) |
| Week 12 | 11/07/2022 | “ | Application Performance Tuning (Start) |
| Week 13 | 11/14/2022 | “ | Application Performance Tuning (End) |
| Week 14 | 11/21/2022 | “ | Quiz #2; Thanksgivings (no class on Wed) |
| Week 15 | 11/28/2022 | “ | Advance Topics; |
| Last Day | 12/05/2022 | “ | Final Exam Review; |
| Final Exam | 12/12/2022 | Sec2: 5:15-7:30PM | Covers class content, textbook, handouts; Project related questions |