

California State University, Sacramento
College of Engineering and Computer Science
Department of Computer Science
Spring 2024

CSc 174 Advanced Database Management Systems

Instructor

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Course

Course Description

Extended Entity-Relationship modeling; Mapping from EER to relational model; SQL programming: procedures, Embedded SQL, SQLJ, JDBC; integrity constraints and triggers; query processing, query optimization; concurrency control, transaction, recovery; functional dependencies and normalization algorithms; Introduction to database security and authorization; Introduction to NoSQL

Course website

Canvas. PLEASE check the announcement on Canvas at least twice a day.

Email Communication

Please try to avoid sending long emails. It is more efficient to use office hours to solve your problem.

Office Hours

Monday: 2:00 pm – 3:00 pm Zoom only: <https://csus.zoom.us/j/84306903709>

Wednesday: 2:00 pm – 4:00 pm RVR 3018 (Department office) In person only.

Course Outcome

Students completing this course will be able to

1. Use Enhanced Entity-Relationship (EER) model for conceptual design
2. Design a relational database by EER-to-relational mapping
3. Design stored procedures and functions using SQL
4. Use SQL to specify constraints
5. Use logical query plan optimization heuristics for query optimization
6. Describe concurrency control and database recovery techniques

Textbook

Elmasri and Navathe, *Fundamentals of Database System*, 7th Edition, Addison-Wesley Publishing

Pre-Requisites

CSc 134 Database management
CSc 131 Computer software engineering

Major Topics Covered in the Course

1. Database system concepts and architecture
2. Enhanced entity-relationship
3. Relational database design by EER-to-Relational mapping
4. SQL: constraints, assertions, views
5. Integrity constraints and triggers.

6. SQL programming techniques
7. Functional dependencies and normalization
8. Query processing and optimization
9. Transaction processing concepts and theory
10. Concurrent control techniques
11. Database recovery techniques
12. Introduction to database security
13. Introduction to NoSQL

Grading

Assignment: 28% (A1: 5%, A2: 6%, A3: 10%, A4: 4%, A5: 3%)

Midterm Exam: 32%

Final Exam: 40%

Grading Scale:

93-100 A	80-83 B-	67-69 D+
90-92 A-	77-79 C+	64-66 D
87-89 B+	74-76 C	60-63 D-
84-86 B	70-73 C-	59 or less F

Coursework

❖ Lecture

Students are expected to attend all lectures. Students are responsible for planning to get notes from other students if they are absent. Students are responsible for getting information from other students about any announcement announced during class period, if they are absent.

❖ Exam

Exams are closed book and in the classroom. MAKE-UP EXMAS ARE NOT GIVEN.

In case of medical emergency, 1) the student must inform the instructor BEFORE the exam by email AND by phone call (916-2786250). Leave a message if the instructor is not in the office.

2) Bring a doctor's note that excuses the student from the activity of taking an exam in the given day.

3) the notes must be emailed to the instructor within the same week that the exam is scheduled.

❖ Assignments

- All assignment submissions must be typed.
- All assignments and homework must be submitted through Canvas. Other types of submission, such as by email, will not be graded and will get a zero.
- If the submitted files are not readable or cannot be opened, you will get a zero as the grade.
- If an assignment requires submitting a certain type of file, for example PDF, submitting any other types of files will get a zero as the grade and the submission will not be graded.
- If there is more than one submission for the same assignment, the last one will be graded, *even if it means the late penalty will be applied.*

View grading feedback:

To view the grading feedback, please check BOTH 1) and 2):

- 1) Comment section
- 2) Click "feedback" button/link to see the comments embedded in your files.

Late assignments:

Some assignments are built based on the previous assignments. The specification of an assignment may contain the solution to the previous assignments. Late assignment will be accepted, the penalties are:

- within 24 hours after the due time: 80% of your original score
- More than 24 hours after the due time: Zero. The assignment will not be graded. Canvas will stop accept submission when you are 24 hours and 1 minute late. Don't wait until the last minute.

❖ **Return of graded work**

Students can get graded work through Canvas. After the grading is posted on Canvas, students must contact the instructor within 5 working days, if there is any grading disagreement. **After 5 working days, the scores are final and your request to discuss your grading will not receive a response.** Students are required to keep backup copies of all submitted work, and also keep all graded work, until after final grades are posted and accepted without disagreement.

Campus Support:

(copied from the instructions from the university)

Services to Students with Disabilities (SSWD) (<https://www.csus.edu/student-affairs/centers-programs/services-students-disabilities/>) offers a wide range of accommodation services that ensure students with disabilities have equal access and opportunity to pursue their educational goals.

Student Health and Counseling Services (<https://www.csus.edu/student-life/health-counseling/>) staff are committed to continuing to provide exceptional service to our campus community. Though many students may be away from campus, most services are offered using secure remote technology.

If you are experiencing challenges with food, housing, financial or other unique circumstances that are impacting your education, help is just a phone call or email away! The CARES office provides case management support for any enrolled student. Email the CARES office at cares@csus.edu to speak with a case manager about the resources available to you. Check out the CARES website.

Course Outline (Tentative schedule)

Week 1	Syllabus Database system concepts and architecture Review of ER model
Week 2	EER model
Week 3	Relational database design by EER-to-Relational mapping
Week 4-6	Review of SQL-99 Table, constraints, and Queries Assertions, views, integrity constraints and triggers, SQL Programming techniques
Week 7	Normalization
Week 8	Midterm Exam (March 25, Monday, Class time)
Week 9	Spring break
Week 10	Normalization
Week 11	Algorithms for query processing and Optimization
Week 12	Transaction processing concepts and Theory
Week 13-14	Concurrency control techniques
Week 15	Database recovery techniques
Week 16	Introduction to database security, Introduction to NoSQL
Week 17	Final Exam