University of Texas at Tyler
Soules College of Business
Department of Computer Science
COSC 3385 – Database Design

Subject to Change

Course Information

COSC 3385 – Database Design Spring 2026
Class Meetings will be in-person on Tuesdays and Thursdays 12:30- 1:50, COB 255

Instructor Contact

Instructor: Sara Memarian Esfahani
Office location: COB 315.04
Zoom Meeting ID: https://uttyler.zoom.us/j/8432799050
Office hours: Tuesdays and Thursdays 7:30 to 12:30, or Zoom by appointment
Email: Use the Inbox in Canvas (MUST include COSC 3385 – Database Design in the Subject Line)
Normally, I will reply to an email within 24 to 48 hours.
To ensure a quick response over the weekends, please email me no later than Friday mornings.
Occasionally I will be unable to respond within that time frame but will inform the class in advance.

About the Professor/Instructor

Welcome to **COSC 3385 – Database Design**! I am **Sara Memarian Esfahani**, your instructor for this course. I'm thrilled to have you in the class and look forward to getting to know you and your academic goals during your time at **UT Tyler**. Together, we will explore key concepts in **database design and analytics**, developing both theoretical understanding and practical skills. I'm confident we will have a rewarding learning experience as we collaborate and achieve great things throughout this course.

Course Description

This course bridges the gap between database theory and practical application. Students will learn to design, implement, and manage robust relational databases that support real-world information systems. The curriculum covers essential techniques including Entity-Relationship (ER) modeling, SQL programming, normalization for data integrity, and concurrency control. The course culminates in a design project where students transform raw requirements into a fully implemented database solution.

Course Structure

This course is a hybrid course that lasts 15 weeks (1 semester). See the course schedule table at the end of this file and on Canvas.

Course Objectives

By the end of this course, students will be equipped to:

- Describe the fundamental architecture and components of Relational Database Management Systems (RDBMS).
- Explain the theoretical foundations of the relational data model, relational algebra, and database design.
- Analyze system requirements to identify necessary entities, attributes, and relationships.
- Design conceptual data models using Entity-Relationship (ER) and Enhanced Entity-Relationship (EER) diagrams.
- Transform conceptual ER/EER models into logical relational schemas.
- Apply normalization techniques to optimize database design and ensure data integrity.
- Implement database structures and formulate queries using SQL Data Definition Language (DDL) and Data Manipulation Language (DML).

Course Topics

1. Database Systems
2. Data Models
3. The Relational Database Model
4. Entity Relationship (ER) Modeling
5. Advanced Data Modeling
6. Normalization of Database Tables
7. Introduction to Structured Query Language (SQL)
8. Advanced SQL
9. Database Design
10. Database Performance Tuning and Query Optimization

Required Materials

Access Requirement: Canvas, Lucidchart, MS Visio, or Draw.io (for ER Diagrams), MySQL Workbench

Textbook: Database Systems: Design, Implementation, & Management (14th Ed) by Coronel & Morris.
Pre-requisites: COSC 1337

Course Requirements and Grading:

Your grade will be determined based on your performance on the activities identified below. No make-up for exams, simulations, or homework will be given. It is highly likely that "extra-credit work" will be assigned to individuals as a replacement for, or in addition to, these components. All points will show up in Canvas. Be sure to review the grading schema below to determine your letter grade.

Requirements	Weight	Description
Midterm Exam	20%	Covers Chapters 1–6 (Theory, ER Diagrams, Normalization).
Final Exam	25%	Cumulative, with focus on SQL & Advanced Concepts (Ch 7–11).
Term Project	20%	A semester-long design project (Design + Implementation).
Lab Assignments (6)	25%	3 Design Labs (Paper) + 3 SQL Labs (Code).
Quizzes/Participation	10%	In-class attendance or short canvas quizzes.
TOTAL	100%	

Individual Assignments: Include in-class practices, quizzes and participation**.**

Exams: There will be two exams during the semester; midterm and final. You will be tested on all material assigned or taught in this course which includes class slides, quizzes, videos, etc. Respondus Lockdown Browser is required to take all exams which require a webcam feature. Instructions are posted on canvas.

If you find that there is no grade recorded for submitted work, or if you want to dispute a grade, you must send your instructor an email about the problem NO LATER THAN 2 DAYS after the submission date.

GRADE CRITERIA: All course work is always due at 11:59 p.m., unless otherwise noted. If you have not finished your projects, submit whatever you have completed. You will earn credit for what you complete.

Assignments (Subject to change)	Points Possible (Approx.)
Quizzes/Participation	100
Lab Assignments (6)	250
Term Project	200

Midterm Exam	200
Final Exam	250
Total Points Possible with no extra credit	**1000**

Total Points (%)	Letter Grade
900 & above	A
800 - 899	B
700 - 799	C
600 - 699	D
599 & below	F

Schedule (subject to change)
Due by Saturday 11:59 p.m. unless otherwise noted

Part 1: Conceptual Design

Focus: Drawing diagrams and understanding data structures before touching a computer.

Week	Date	Tuesday (Lecture)	Thursday (Lab/Activity)
1	Jan 13/15	Ch 1: Database Systems Files vs. DBMS, Role of DBMS.	Intro to Tools Install MySQL/Workbench on laptops. Activity: Business Rule Identification.
2	Jan 20/22	Ch 2: Data Models Evolution of models, Business Rules.	Lab 1: Business Rules Analyze a case study text and extract data requirements.
3	Jan 27/29	Ch 3: Relational Model Keys (PK, FK), Integrity, Indexes.	Activity: Schema Mapping Practice linking tables on the whiteboard.
4	Feb 3/2005	Ch 4: ER Modeling Entities, Attributes, Relationships.	Lab 2: ER Diagramming Drawing Crow's Foot Diagrams using Lucidchart/Visio.
5	Feb 10/12	Ch 5: Advanced Data Modeling Supertypes/Subtypes, Inheritance.	Activity: The "EER" Challenge Modeling complex scenarios (e.g., Hospital Triage).
6	Feb 17/19	Ch 6: Normalization1NF, 2NF, 3NF.	Lab 3: Normalization Convert a messy Excel sheet into 3NF. (Board work).
7	Feb 24/26	Review for Midterm Practice ERD problems in class.	MIDTERM EXAM

Part 2: Implementation

Focus: Moving from diagrams to actual SQL code.

Week	Date	Tuesday (Lecture)	Thursday (Lab/Activity)
8	Mar 3/2005	Ch 7: Intro to SQL (DDL) Creating Tables, Data Types, Constraints.	Lab 4: Building the Structure Students implement their Lab 2 ERD in SQL.
-	Mar 9-13	SPRING BREAK	NO CLASS

9	Mar 17/19	Ch 7: Intro to SQL (DML) INSERT, UPDATE, DELETE, Basic SELECT.	Activity: Data Population Scripting dummy data insertion.
10	Mar 24/26	Ch 8: Advanced SQL (Joins) Inner, Left, Right, Full Joins.	Lab 5: The Join Lab Solving multi-table query problems.
11	Mar 31/Apr 2	Ch 8: Advanced SQL (Aggregates) GROUP BY, HAVING, Subqueries.	Activity: SQL Challenge Complex reporting queries.
12	Apr 7/9	Database Design Lifecycle (Chapter 9) SDLC, Systems Planning.	Project Workday, check-in for Project ERDs.
13	Apr 14/16	Ch 11: Performance Tuning Indexes, Query Optimization.	Lab 6: Performance Compare query speed with/without Indexes.
14	Apr 21/23	Project Delivery	
15	Apr 28/30	Final Exam Week	

Communication Expectations

The most convenient way to communicate with the instructor is through the Inbox in Canvas. Download the mobile app for your convenience.

Discussion Board Communication

Please post general course or assignment questions to the General Course Questions & Answers Discussion Topic. Students are encouraged to respond to their fellow classmates' questions. I will read all discussion postings and add comments/suggestions/questions as necessary to keep the discussion on topic. Specific topic instructions on discussions are provided in the forums when needed.

Canvas Notifications:

Receive instant notifications about course events, such as submissions, discussion messages, and announcements through canvas. Assignments and all deliverables will be graded and returned no later than one week after the due date.

UT Tyler Student Resources

- UT Tyler Writing Center: Provides support for writing assignments and skill development. Contact: (903) 565-5995 | writingcenter@uttyler.edu
- UT Tyler Tutoring Center: Offers tutoring across various subjects to support academic success. Contact: (903) 565-5964 | tutoring@uttyler.edu
- Mathematics Learning Center (RBN 4021): An open-access computer lab for math students with tutors available to assist in early-career math courses.
- UT Tyler Counseling Center: Provides confidential counseling and support services for students. Contact: (903) 566-7254

Code of Conduct and Ethics

Disciplinary actions may be taken against any student involved in academic dishonesty, which includes but is not limited to cheating, plagiarism, collusion, or submitting work that is wholly or partially the work of another person. Engaging in any act intended to provide an unfair academic advantage or attempting such actions is prohibited.

Cheating includes but is not limited to:

- Copying from another student's test or assignment.
- Using unauthorized materials during a test.
- Failing to follow instructions given by the test administrator.
- Possessing unauthorized materials, such as notes or textbooks, during an exam.
- Stealing, buying, or soliciting test materials or answers.
- Collaborating with or seeking help from others during a test without permission.
- Discussing exam content with students who have yet to take the test.
- Revealing exam questions when instructed to keep them confidential.
- Substituting for another person in a test or coursework.
- Offering money or coercing others to obtain test materials.
- Falsifying research data, lab results, or academic work for credit.
- Damaging or misplacing university property to gain academic advantage.
- Providing false information, such as grades or achievements, for personal gain or to harm others.
- Plagiarism includes but is not limited to:
    - Using someone else's work without proper citation and presenting it as your own.
    - Buying, receiving, or obtaining academic work and submitting it for credit.
- Collusion includes but is not limited to:
    - Collaborating with others on assignments without authorization.
    - Working with others to violate academic integrity policies.
- All submitted written work will be subject to plagiarism detection software review.

The instructor will post both UNOFFICIAL grade reports using Canvas

THREE BEFORE ME RULE: If you have any issues or questions about assignments, class policies and schedules, etc. and want to speak with me (the Professor), please remember the three before me rule as stated in the next sentence. You must have attempted at least three options before you come to me. For example: TA, tutor, grader, etc. You must tell me what you tried and the results, including screen prints of errors or printed error messages.

Name:----------

Signature:----------

Date: ----------