

TED UNIVERSITY, COURSE SYLLABUS

Faculty	Engineering	Department	CMPE
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Course Code & Number	CMPE 232	Course Title	Database Systems
Type of Course	☒ Compulsory ☐ Elective	Semester	☐ Fall ☒ Spring ☐ Summer
Course Credit Hours	(3+0+0) 3	Number of ECTS Credits	5
Pre-requisite	N/A	Co-requisite	N/A
Mode of Delivery	☒ Face-to-face ☒ Distance learning	Language of Instruction	☒ English ☐ Turkish
Course Coordinator	Dr. Bilgin Avenoğlu	Course Lecturer(s)	Dr. Bilgin Avenoğlu Dr. Yücel Çimtay
Required Reading	Fundamentals of Database Systems 6th Edition, Ramez Elmasri, Shamkant B. Navathe	Course Assistant(s)	

Course Catalog Description	Database system concepts and architecture. Relational databases and SQL. Database normalization. File structures and indexing. Transaction processing and concurrency control. NoSQL Databases.
Course Objectives	The objective of this course is to provide understanding of large scale data storage and management techniques using relational database systems. The course provides information on how to design and normalize a database for storing; modifying and querying data in an efficient manner. The course includes new database research areas such as Big Data and NoSQL.
Course Learning Outcomes	Upon successful completion of this course, a student will be able to 1. Understand database concepts and applications. 2. Recognize and use contemporary logical design methods and tools for databases. 3. Derive a physical design for a database from its logical design. 4. Understand the SQL data definition and SQL data manipulation languages. 5. Understand the concepts of constraints and produce well-structured database using functional dependencies and normalization. 6. Install, configure, and interact with a relational database management system. 7. Explain data structures and algorithms used to efficiently store and retrieve information in database systems. 8. Analyze techniques for transaction processing, concurrency control, backup and recovery that maintain data integrity in database systems. 9. Describe the new database research areas such as Big Data and NoSQL. 10. Develop team spirit and professional attitude towards the development of database applications.

Course Contents	Database system concepts and architecture. Relational data model and SQL. Database normalization. Indexing. Transaction Processing. Concurrency Control. Big Data and NoSQL Systems.
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Teaching Methods & Learning Activities	☒ Telling/Explaining ☒ Discussions/Debates ☒ Questioning ☒ Reading ☒ Peer Teaching ☐ Scaffolding/Coaching ☒ Demonstrating ☒ Problem Solving ☐ Inquiry ☒ Collaborating ☐ Think-Pair-Share ☐ Predict-Observe-Explain ☐ Microteaching ☐ Case Study/Scenario Analysis	☐ Simulations & Games ☒ Video Presentations ☒ Oral Presentations/Reports ☐ Concept Mapping ☐ Brainstorming ☐ Drama/Role Playing ☐ Seminars ☐ Field Trips ☐ Guest Speakers ☒ Hands-on Activities ☐ Service Learning ☒ Web Searching ☐ Experiments ☐ Other(s):
Assessment Methods (Formal & Informal)	☒ Test/Exam ☒ Quiz/Homework ☒ Oral Questioning ☒ Performance Project ☒ Written ☐ Oral	☐ Observation ☐ Self-evaluation ☒ Peer Evaluation ☐ Portfolio ☒ Presentation (Oral, Poster) ☐ Other(s):

Student Workload (Total 150 Hrs)	☒ Lectures 42 .. hrs ☒ Course Readings 13 .. hrs ☐ Workshop hrs ☐ Online Discussion hrs ☐ Debate hrs ☐ Work Placement hrs ☐ Field Trips/Visits hrs ☐ Observation hrs ☐ Laboratory Applicationshrs ☒ Hands-on Work 13 hrs ☒ Quizzes 12 .. hrs ☒ Midterm I..... 10 .. hrs ☐ Midterm II..... hrs ☒ Final..... 20 .. hrs	☐ Resource Review hrs ☐ Research Review hrs ☐ Report on a Topic hrs ☐ Case Study Analysis hrs ☐ Oral Presentation hrs ☐ Poster Presentation hrs ☐ Demonstration hrs ☐ Web Designs hrs ☐ Mock Designs hrs ☒ Team Meetings..... 10 hrs ☒ Other (Project)..... 20 hrs
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COURSE POLICIES	
I. Attendance	
Attendance to the course is necessary but not mandatory.	
II. Missed Work	

There will be no make-up for quizzes. Make-ups for midterm and final exams will be provided if the student can provide a legal document (a health committee report or a positive COVID-19 test result, taken maximum three days before the exam date) confirming a life threatening health issue at the time of the examination.

III. Late Assignment Submission Policy

Late submission is not possible.

IV. Extra Credit

Extra credits will not be offered.

V. Assignment Rules

A student can submit only one work. In case of multiple submissions, only the latest submission will be considered. Students cannot submit work on other students' behalf.

VI. Plagiarism

"All of the following are considered plagiarism:

- turning in someone else's work as your own
- copying words or ideas from someone else without giving credit
- failing to put a quotation in quotation marks
- giving incorrect information about the source of a quotation
- changing words but copying the sentence structure of a source without giving credit
- copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not" (www.plagiarism.org)

Plagiarism is a very serious offense and will be penalized accordingly by the university disciplinary committee. The best way to avoid accidentally plagiarizing is to work on your own before you ask for the help of other resources.

VII. Cheating

Cheating has a very broad description which can be summarized as "acting dishonestly". Some of the things that can be considered as cheating are the following:

- Copying answers on examinations, homework and laboratory works,
- Using prohibited material on examinations,
- Lying to gain any type of advantage in class
- Providing false, modified or forged data in a report
- Plagiarizing
- Modifying graded material to be re-graded.
- Causing harm to colleagues by distributing false information about an examination, homework or laboratory.

VIII. Class Participation

Participation in class is necessary but not mandatory. Some lectures require you to attend to the lectures to earn some points. By actively participating in class, you can improve your learning process and immediately confirm what you have learned and what you have not internalized. Do not forget that you are not expected to know all of the material being discussed in class. Actually, you are expected not to know it. Therefore, there is no point in being hesitant to join a conversation or ask a question.

IX. Class Readings

Class readings are necessary but not mandatory. The material covered in class by your instructor will only provide a fundamental understanding of the general context. If you are willing to effectively learn something, you must actively work on it yourself. Reading is one of the most successful ways of learning about a topic.

COURSE ASSIGNMENTS	
A. Mid-term [30%]	
There will be 1 midterm examination worth 30% of the overall grade.	
B. Quizzes [15%]	
7.5% for each quiz. There will be 2 quizzes comprising %15 of the total score.	
C. Homework [0%]	
No homework.	
D. Project [20%]	
There will be a term project comprising % 20 of the total score.	
E. Final [35%]	
There will be a final examination worth 35% of the overall grade.	

GRADING
A. The course will be graded based on a curve. Students who have not accumulated at least 15 points before the final examination will get “FX” grade.

TENTATIVE COURSE OUTLINE				
W	Day	Topics	Related Reading from Book	Assignments
1	14.02-18.02	Syllabus / Introduction to Databases		
2	21.02-25.02	Conceptual Data Modeling and Database Design		
3	28.02-04.03	Conceptual Data Modeling and Database Design		Project Groups and Project Abstract
4	07.03-11.03	Relational DB Design by ER- to Relational Mapping		
5	14.03-18.03	The Relational Data Model and SQL		Project ER Model
6	24.03-25.03	The Relational Data Model and SQL		Quiz 1
7	28.03-01.04	Advanced SQL		
8	04.04-08.04	Advanced SQL		
9	11.04-15.04	Database Design Theory and Normalization		Midterm
10	18.04-22.04	File Structures, Hashing, Indexing, and Physical Database Design		Project Relational Model and DB structures
11	25.04-29.04	Introduction to Transaction Processing Concepts and Theory		
12	02.05-06.05	Holiday		

13	09.05-13.05	Concurrency Control, and Recovery		Quiz 2
14	16.05-20.05	NoSQL Systems, Cloud Computing, and Big Data		
15	23.05-27.05	NoSQL Systems, Cloud Computing, and Big Data		
		FINAL EXAMS (from May 30, 2022 to Jun 10, 2022)		

COURSE ASSESSMENTS & LEARNING OUTCOMES MATRIX	
Assessment Methods	Course Learning Outcomes
Quiz 1	LO1, LO2, LO3, LO4
Quiz 2	LO5, LO7
Midterm	LO1, LO2, LO3, LO4
Project	LO1, LO2, LO3, LO4, LO5, LO6, LO7, LO8, LO10
Final	LO1, LO2, LO3, LO4, LO5, LO7, LO8, LO9

Prepared By & Date	Dr. Bilgin Avenoğlu 07/02/2022	Revision Date	07/02/2022
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