



**East West University**  
**Department of Computer Science and Engineering**  
**Course Outline of CSE302**  
**Spring 2024 Semester**

**Course: CSE302 Database Systems**

**Credits and Teaching Scheme**

	Theory	Laboratory	Total
Credits	3	1.5	4.5
Contact Hours	3 Hours/Week for 13 Weeks + Final Exam in the 14 <sup>th</sup> Week	3 Hours/Week for 13 Weeks	6 Hours/Week for 13 Weeks + Final Exam in the 14 <sup>th</sup> Week

**Prerequisite**

CSE106 Discrete Mathematics

**Instructor Information**

**Instructor:** **Mahmuda Rawnak Jahan**  
Lecturer, Department of Computer Science and Engineering  
**Office:** Room # FUB702  
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**Course Objective**

This course introduces the fundamental concepts and practices of designing and implementing database systems. It also enables the student to design and perform complex query operations on relational databases. It builds the capability of optimizing the databases efficiently by applying different techniques. Knowledge of this course will be needed as prerequisite knowledge for future courses such as CSE 411 Software Engineering and Information System Design, CSE 435 Software Quality Assurance, CSE 436 Multimedia Design and Development, CSE464 Advanced Database System, CSE480 Web Database Programming.

**Knowledge Profile**

K4: Forefront engineering specialist knowledge for practice  
K5: Engineering design  
K6: Engineering practice (technology)

**Learning Domains**

Cognitive - C3: Applying, C4: Analyzing, C6: Creating  
Psychomotor – P2: Manipulation, P3: Precision, P4: Articulation  
Affective - A2: Responding

**Program Outcomes (POs)**

PO1: Engineering Knowledge

PO3: Design/Development of Solutions

PO5: Modern Tool Usage

PO10: Communication

### Complex Engineering Problem Solution

EP1: Depth of knowledge required

EP2: Range of conflicting requirements

EP3: Depth of analysis required

### Complex Engineering Activities

EA1: Range of resources

EA2: Level of interaction

### Course Outcomes (COs) with Mappings

After completion of this course students will be able to:

CO	CO Description	PO	Learning Domains	Knowledge Profile	Complex Engineering Problem Solving/ Engineering Activities
CO1	<b>Apply</b> the basic concepts of relational database systems and <b>formulate</b> algebraic expressions for representing relations.	PO1	C3	K4	
CO2	<b>Perform</b> and <b>analyze</b> a wide range of data manipulation activities using a query language for solving database queries.	PO1	C3, C4	K4	
CO3	<b>Create</b> a relational data model using appropriate tools and <b>justify</b> the goodness of the model using other optimization techniques for database-oriented application.	PO3	C4, C6 A2	K5	EP1, EP2, EP3
CO4	<b>Choose</b> and <b>justify</b> appropriate tools for building a relational data model and <b>create</b> real-life, complex database applications.	PO5	P2, P3 C3, C4, C6	K6	EP1, EP2, EP3
CO5	<b>Demonstrate</b> skills, <b>present</b> concepts, and <b>write</b> reports to design, build and test a real-life, complex database application.	PO10	P3, P4 A2 C3, C6	K4, K5	EA1, EA2

**Course Topics, Teaching-Learning Method, and Assessment Scheme**

Course Topic	Teaching-Learning Method	CO	Mark of Cognitive Learning Levels			CO Mark	Assessment (Mark)
			C3	C4	C6		
Introduction to Database Management Systems and Relational Model	Lectures and discussions inside and outside the class	CO1				3	<b>Mid Term Assessment (20)</b>
Writing Basic and Advanced Relational Algebra	Do	CO1				7	
Writing Basic and DDL and DML Queries, Aggregate Queries using SQL (Structured Query Language)	Do	CO2				5	
Intermediate and Advanced SQL Queries such as Join, nested subqueries, views, authorization.	Do	CO2				5	
Designing a Database using ER and EER Model	Do	CO3				10	<b>Final Exam (30)</b>
Database Normalization based on Functional Dependency, Boyce-Codd Normal Form	Do	CO3				7	
Database Indexing and Hashing Techniques	Do	CO3				5	
Transaction Management and Concurrency Control Protocols	Do	CO3				8	



## Mini Projects

Mini Project	Teaching-Learning Method	CO	Mark of Cognitive Learning Level		Mark of Psychomotor Learning Levels		Mark of Affective Learning Level	CO Mark
			C3	C6	P3	P4	A2	
Lab-based Mini Project Implementation Report and Presentation	Group-based moderately complex design project with report writing and oral/poster presentation	CO 4						10
Mini Project Reporting and Presentation		CO 5						5
Total								15

## Overall Assessment Scheme

	CO-wise Breakdown						PO-wise Breakdown				
	CO 1	CO 2	CO 3	CO 4	CO 5		PO 1	PO 3	PO 5	PO1 0	Total
Class Test	2.5	2.5	5	0	0		5	5	0	0	10
Mid Term Assessment	10	10	0	0	0		20	0	0	0	20
Final Exam	0	0	30	0	0		0	30	0	0	30
Lab Performance, Lab Exam and Mini Project Implementation	0	0	0	30	0		0	0	30	0	30
Mini Project Presentation	0	0	0	0	5		0	0	0	5	5
Assignments	0	0	5	0	0		0	5	0	0	5
<b>Total</b>	<b>12.5</b>	<b>12.5</b>	<b>35</b>	<b>30</b>	<b>10</b>		<b>25</b>	<b>40</b>	<b>30</b>	<b>5</b>	<b>100</b>

## Teaching Materials/Equipment

### Text Book:

Avi Silberschatz, Henry F. Korth, S. Sudarshan, *Database System Concepts*, Seventh Edition, McGraw-Hill, ISBN 0-07-352332-1

Link: <https://www.db-book.com/>

### Reference Book:

- Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom, *Database Systems: The Complete Book*, Stanford InfoLab (2<sup>nd</sup> edition)
- Thomas Connolly, Carolyn Begg, *Database Systems: A Practical Approach to Design, Implementation and Management*, Pearson (6<sup>th</sup> edition)

### Software/Tools:

- Oracle Database <https://www.oracle.com/database/>
- MySQL Database <https://www.mysql.com/>
- Other appropriate tools to design and develop a database application.

\* Lecture Slides and Lab Manuals will be made available to the students during the class.

## Grading System

Marks (%)	Letter Grade	Grade Point	Marks (%)	Letter Grade	Grade Point
80 and above	A+	4.00	55-59	B-	2.75
75-79	A	3.75	50-54	C+	2.50
70-74	A-	3.50	45-49	C	2.25
65-69	B+	3.25	40-44	D	2.00
60-64	B	3.00	Below 40	F	0.00

## Exam Dates

As per the schedule provided by the university.

## Academic Code of Conduct

### Academic Integrity:

Any form of cheating (physical/online), plagiarism, personification, falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties as decided by the Disciplinary Committee of the university.**

### Special Instructions:

- Students are expected to attend all classes and examinations. A student **MUST** have at least 80% class attendance to sit for the final exam.
- Students will not be allowed to enter the classroom after 10 minutes of the starting time.
- For plagiarism, the grade will automatically become zero for that exam/assignment.
- Normally there will be **NO make-up exam**. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student miss any exam, the student **MUST** get approval of makeup exam by written application to the Chairperson through the Course Instructor **within 48 hours** of the exam time. Proper supporting documents in favor of the reason of missing the exam have to be presented with the application.
- For **final exam**, there will be NO makeup exam. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student miss the final exam, the student **MUST** get approval of **Incomplete Grade** by written application to the Chairperson through the Course Instructor **within 48 hours** of the final exam time. Proper supporting documents in favor of the reason of missing the final exam have to be presented with the application. **It is the responsibility of the student to arrange an Incomplete Exam within the deadline mentioned in the Academic Calendar in consultation with the Course Instructor.**
- All mobile phones **MUST** be turned to silent mode during class and exam period.
- There is **zero tolerance for cheating** in exam. Students caught with cheat sheets in their possession, whether used or not; writing on the palm of hand, back of calculators, chairs or nearby walls; copying from cheat sheets or other cheat sources; copying from other examinee, etc. would be treated as cheating in the exam hall. The only penalty for cheating is **expulsion for several semesters as decided by the Disciplinary Committee of the university.**