UNITED INTERNATIONAL UNIVERSITY

Department of Computer Science and Engineering (CSE)

Course Syllabus

1	**Course Title**	Database Management Systems
2	**Course Code**	CSI 221
3	**Trimester and Year**	Summer 2022
4	**Pre-requisites**	NIL
5	**Credit Hours**	3.00
6	**Section**	C
7	**Class Hours**	Day : Sat 10:05AM – 11:35AM Day : Tue 10:05AM – 11:35AM
8	**Classroom**	Room # 409
9	**Instructor's Name**	Md. Romizul Islam
10	**Email**	romizul@cse.uiu.ac.bd
11	**Office**	336
12	**Counselling Hours**	Sat 11:40AM – 2:00PM Sun 11:30AM – 12:30PM Tue 11:40AM – 2:00PM Wed 11:30AM – 12:30PM Not applicable for the first week. Email a day before for confirmation.
13	**Text Book**	1. Database System Concepts (7th Edition) by Abraham Silberschatz, Henry F. Korth and S. Sudarshan 2. Database Systems: The Complete Book by Garcia-Molina, Ullman and Widom
14	**Reference**	http://www.db-book.com/
15	**Course Contents (approved by UGC)**	Concepts and methods in database system, File organization and retrieval, Data manipulation, Query formulation and language, Database models, Data description languages, database integrity and security, Data dictionary/directory systems, database administration, Database design, Survey of some existing database management systems, Some applications using commercial languages.

16 Course Outcomes (COs)

COs	Statement	Bloom's Domain	Program outcome	Knowledge profile	Complex problem	Engineering activities	g	Eng g ac
CO1	Learn the fundamentals of database systems including: data models, database architectures, database manipulations, file organization and retrieval	C	a Engineering Knowledge	Engineering fundamentals (K3) Specialist Knowledge (K4)	Depth of Knowledge (P1) Depth of Analysis (P3)	--		
CO2	Learn the theories and techniques in developing database applications, management and security	C	a Engineering Knowledge					
CO3	Demonstrate the management and administration of database systems	C	b Problem Analysis					
CO4	Prescribe new developments and trends in databases using commercial languages on contemporary issues	C	b Problem Analysis					

17	**Teaching Methods**	Lecture (L), Case Study (CS), Q/A, Assignment (A), Class Test (CT), Mid, Final exam
18	**CO with Assessment Methods**	

CO	Assessment Method	(%)
-	Attendance	5
-	Assignments	5
-	Class Tests	20
CO1, CO2	Midterm exam	30
CO3, CO4	Final exam	40

20	**Lecture Outline**

Class	Topics/Assignments	COs	Reading Reference	Lecture Outcomes/Activities
1	Introduction to database, relational database, necessity of database management systems. Different data models and administration of database.	CO1, CO2	Sec 1.2, 1.3	Student will know the importance of database management systems
2	Entity relationship data model: attributes and constraints.	CO1	Sec 6.2, 6.3, 6.4	Get the idea of entity database model
3	Entity relationship data model: case study to design database.	CO1, CO2	Sec 6.5, 6.7	Apply the knowledge of entity model to design real life database
4	Introduction to schema models, definition and manipulation language,	CO1	Sec 1.4	Introduce with the schema concepts of database
5	Relational Database: constraints, attributes, manipulations.	CO1, CO2	Sec 3.2, 3.9	Introduce with relational database model
6	Relational Database: simple query details	CO1, CO2	Sec 3.2, 3.3, 3.4	Apply basic queries using enterprise language
7	Relational Database: complex query details	CO1, CO2	Sec 3.7, 3.8, 4.1	Apply complex queries using enterprise language
8	Relational Database: View concepts	CO1, CO2	Sec 4.2	Visualize the outcome of database queries
9	Relational Algebra: Basic Operations	CO2	Sec 2.6	Understand the internal process of database queries
10	Relational Algebra: complex Operations	CO2	Sec 2.6	Understand the internal process of database queries
11	Relational Database: security and integrity management	CO2	Sec 4.3, 4.4	Impose the security and integrity in database.
12	Review of mid syllabus	--	--	
	MIDTERM EXAM			
13	Database theories: functional dependencies, impact of functional dependencies.	CO3	Sec 7.4	Know the theories of functional dependencies
14	Database techniques: anomaly problems, normalization, different normal forms	CO3	Sec 7.3	Know the techniques to minimize redundancy
15	Database theories and techniques:	CO3	Sec 7.5	Apply the knowledge of

	application of functional dependencies to normalize the database into different normal forms.			database theories to reduce redundancy
16	Application of Normalization in designing database on real life problems	CO3, CO4	Sec 7.5	Apply the database theory and techniques in real life.
17	Indexing and Hashing: introduction, importance, types, applications	CO3	Sec 14.1, 14.2	Understand the database techniques to reduce the time complexity of queries
18	Indexing: B+ tree structure, manipulation of B+ tree structure	CO3	Sec 14.3	Understand the database techniques to reduce the time complexity of queries
19	Hashing: Dynamic hash structure and its manipulation	CO3	Sec 14.5	Understand the database techniques to reduce the time complexity of queries
20	Transaction: definition, characteristics, importance, states	CO3	Sec 17.1, 17.4	Map the database knowledge with real tasks
21	Transaction: consistency and serializability	CO3	Sec 17.6	Impose the important characteristics to ensure actual tasks
22	Transaction: atomicity and back up system. RAID: different levels.	CO4	Sec 12.5	Understand the back up techniques.
23	File storage management	CO4	Sec 12.1	Visualize the overall file systems.
24	Review of final syllabus	--	--	

Appendix 2: Grading Policy

Letter Grade	Marks %	Grade Point	Letter Grade	Marks%	Grade Point
A (Plain)	90-100	4.00	C+ (Plus)	70-73	2.33
A- (Minus)	86-89	3.67	C (Plain)	66-69	2.00
B+ (Plus)	82-85	3.33	C- (Minus)	62-65	1.67
B (Plain)	78-81	3.00	D+ (Plus)	58-61	1.33
B- (Minus)	74-77	2.67	D (Plain)	55-57	1.00
			F (Fail)	<55	0.00

Appendix-3: Program outcomes

POs	Program Outcomes
PO1	An ability to apply knowledge of mathematics, science, and engineering
PO2	An ability to identify, formulate, and solve complex engineering problems
PO3	An ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations
PO4	An ability to investigate complex problems using research-based knowledge and research methods design and conduct experiments, as well as to analyze and interpret data
PO5	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
PO6	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
PO7	Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts
PO8	An understanding of professional and ethical responsibility
PO9	An ability function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings
PO10	An ability to communicate effectively
PO11	Project management and finance
PO12	A recognition of the need for, and an ability to engage in life-long learning