



Ahsanullah University of Science and Technology Bangladesh

COURSE OUTLINE

1. Title: **Database**
2. Code: **CSE3103**
3. Credit hours: **3**
4. Level: **Level 3, Term 1**
5. Faculty: **Engineering**
6. Department: **Computer Science and Engineering (CSE)**
7. Programme: **Bachelor of Science in Computer Science and Engineering (B.Sc. in CSE)**
8. Synopsis from the Approved Curriculum:

Basic concepts of data and database systems; Data models; Query languages: Relational algebra and calculus, SQL; Query processing: interpretation, cost estimation, optimization; Functional dependency and normalization; File organization; Data Dictionary and directory systems; Database management: database administration, security & integrity; Introduction to advanced database systems.
9. Type of course (core/elective): **Core**
10. Prerequisite(s) (if any): **CSE1203 (Discrete Mathematics)**
11. Name of the instructor(s) with contact details and office hours:

**Nazmus Sakib
Room: 7A01/M
Phone: Extension 519
E-mail: sakib.cse@aust.edu, nazmussakib009@gmail.com
Office hour: SUN 10:30 – 11:30 AM, TUE 2:00 – 3:00 PM**
12. Semester Offered: **Fall, 2020-2021**
13. Mapping of Course Outcomes with Bloom's Taxonomy and Programme Outcomes

Sl. No.	COs	POs	Bloom's Taxonomy		
			C	A	P
1	Comprehend the fundamental concepts of database system, data models and architecture.	1	2		
2	Apply proven techniques from relational algebra, SQL, query processing, interpretation, Entity Relation Modeling, schema diagram.	2	3		
3	Analyze complex problems database administration, normalization, indexing, database security, file organization and transaction processing.	4	4		

14. Percentages of Assessment Methods

Method	Percentage
Class Performance	10
Quizzes	20
Final Examination	70

15. Week wise distribution of contents and assessment methods

Week	Topics	Assessment Method(s)
1	Introduction: General discussion on databases, Advantages of a database over a file processing system, Different levels of data abstraction, Instance and schema of a database with examples, Data independence.	
2	Database languages: Data manipulation and data definition language, Functions of a database administrator, Different types of database users.	
3	ER model: Entity, Entity set, Attributes, Types of attributes, Introduction to ER model, Mapping cardinalities with examples.	Quiz 1
4	Existence dependence, Primary key, Candidate key, super key, Problems on modeling ER diagrams.	
5	Relational model: transforming ER model to a Relational model.	
6	Familiar with the database tables schemas, Introduction to relational algebra expressions, Introduction to Structured Query Language	

	commands, Concept of functional dependencies and problems on them.	
7	Introduction to normal forms with problems, Learn about the conversion of first and second normal forms, Problems and procedures of the third normal form.	Quiz 2
8	Introduce the conversion of Boyce Codd normal form, Introduction to integrity constraints with examples, Query processing and optimization.	
9	Process of indexing and hashing methods in the database, Introduction to transactions: Transactions commit and abort.	
10	ACID features supported by a database transaction, Maintain data integrity and security, Sources of error, Use of log, Recovery approaches for transactions.	Quiz 3
11	Concurrent executions, theory of serializability in transaction, Query processing and query optimization. Query handler, cost calculation and optimization.	
12	Database System Architecture, server architecture, Parallel systems, distributed systems, Implementation of database security and integrity.	
13	Basic concept of the file organization and directory system, Data warehouses and Data mining, Introduction to Advanced Databases.	Quiz 4
14	Review Class.	

16. References

16.1. Required (if any)

- 1. “Database System Concepts” written by Abraham Silberschatz, Henry F. Korth, S. Sudarshan. 6th Edition, The McGraw-Hill Companies Ltd.**
- 2. “Database Systems: The Complete Book” written by Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom. 2nd edition.**

16.2. Recommended (if any)

- 1. Course website -**

Prepared by:	Checked by:	Approved by:
Signature: _____	Signature: _____	Signature: _____
Name: Nazmus Sakib Department: CSE Date:	Name: Dr. Mohammad Shafiul Alam OBE Program Coordinator, CSE Date:	Name: Dr. Mohammad Shafiul Alam HOD, CSE Date:

Annex-1: PEO of CSE

PEO1 - Professionalism

Graduates will demonstrate sound professionalism in computer science and engineering or related fields.

PEO2 – Continuous Personal Development

Graduates will engage in life-long learning in multi-disciplinary fields for industrial and academic careers.

PEO3 – Sustainable Development

Graduates will promote sustainable development at local and international levels.

Annex-2: Mapping of PEO-PO

	PEO1	PEO2	PEO3
PO1 - Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.	√		
PO2 - Problem analysis: Identify, formulate, research and analyze complex engineering problems and reach substantiated conclusions using the principles of mathematics, the natural sciences and the engineering sciences.	√		
PO3 - Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety as well as cultural, societal and environmental concerns.	√		
PO4 – Investigation: Conduct investigations of complex problems, considering design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.	√		
PO5 - Modern tool usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	√		
PO6 - The engineer and society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.	√		√
PO7 - Environment and sustainability: Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.	√		√
PO8 – Ethics: Apply ethical principles and commit to professional ethics, responsibilities and the norms of engineering practice.	√		

PO9 - Individual work and teamwork: Function effectively as an individual and as a member or leader of diverse teams as well as in multidisciplinary settings.	√	√	
PO10 – Communication: Communicate effectively about complex engineering activities with the engineering community and with society at large. Be able to comprehend and write effective reports, design documentation, make effective presentations and give and receive clear instructions.	√		
PO11 - Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work as a member or a leader of a team to manage projects in multidisciplinary environments.	√		
PO12 - Life-long learning: Recognize the need for and have the preparation and ability to engage in independent, life-long learning in the broadest context of technological change.		√	

Annex-3: Blooms Taxonomy – Revised Version*

Level	Cognitive Domain (C)	Affective Domain (A)	Psychomotor Domain (P)
1	Remember	Receive	Imitate
2	Comprehend	Respond	Execute
3	Apply	Value	Perform
4	Analyze	Conceptualize Values	Adaption
5	Evaluate	Internalize Values	Neturalize
6	Create		

* References: Dyjur, P. (2018). Writing Course Outcomes