Ahsanullah University of Science and Technology
Bangladesh

COURSE OUTLINE

1. Title: Database Lab

2. Code: CSE3104

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:

Laboratory works based on CSE3103

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):

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	**Proficiency in the design of database applications starting from the conceptual design to the implementation of database schemas and user interfaces.**	**2**			**2**
2	**Solid foundation on database design concepts, data models (E/R model, relational model), the database query language SQL, and components of a database management system.**	**6**			**3**
3	**Basic understanding of data access structures, query processing and optimization techniques, and transaction management.**	**9**			**4**

14. Percentages of Assessment Methods

Method	Percentage
Class Performance	**20**
Quizzes	**40**
Final Examination	**40**

15. Week wise distribution of contents and assessment methods

Week	Topics	Assessment Method(s)
1	**Introduction to database SQL and MySQL IDE** **Getting acquainted with major components of a database system. Setting up and executing IDE.**	
2	**Basic SQL Concept** **Different data types, DDL statements (create, alter, drop, truncate, rename) used for defining database objects.**	
3	**SQL structures** **Inserting data, Basic structure of SQL queries (use of select, from, where clause).**	**Quiz 1**
4	**SQL structures** **String operation, Order by clause. An Online Test will be performed.**	
5	**Multiple queries**	

	Solving problems using Joins, Simple Join, different outer joins.	
6	**Database updates** **Introduction to data integrity, database advanced constraint capabilities.**	**Quiz 2**
7	**Database design process** **Entity-Relationship diagram (ER diagram), General discussion on term projects, ER diagram design for specific project.**	**Mid Exam**
8	**SQL functions and database integrity** **Solving problems of SQL Transaction Model. A mid test will be taken based on contents covered up to 7th week.**	
9	**Database project review:** **Discussing the project and checking the requirements. Learning about different user interfaces.**	**Quiz 3**
10	**Advance SQL functions** **Introduction to use of aggregate functions, null values and working on few related problems.**	
11	**Multiple SQL function** **Introduction to use of Group By, Having, Basic Join operations (inner join and outer join). Solving problems on related topics.**	
12	**Nested queries, Subqueries** **Learning about Nested subqueries, structure of subqueries, Complex queries and solve various nested queries problems.**	**Quiz 4**
13	**User Interface (UI)** **Introduction to simple user interface. Learning the process of connectivity of database with the user interface. Creation of function for inserting and viewing data from database and working to different related problems.**	
14	**Project submission and presentation** **Submission of the database project and the user interface design. A final test will be taken based on contents covered up to 12th week.**	**Final Exam**

16. References

16.1. Required (if any)

1. SQL The Complete Reference, by James R. Groff, Paul N. Weinberg.

2. Head First SQL, by Lynn Beighley.

16.2. Recommended (if any)

1. **Course website -**

Prepared by:	**Checked by:**	**Approved by:**
Signature: _____ Name: **Nazmus Sakib** Department: **CSE** Date:	Signature: _____ Name: **Dr. Mohammad Shafiul Alam** **OBE Program Coordinator, CSE** Date:	Signature: _____ 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	Intermalize Values	Neturalize
6	Create		

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