Description of Course CSE 201

PART A: General Information

1	**Course Title**	: Database Management System
2	**Type of Course**	: THEORY
3	**Offered to**	: DEPARTMENT OF IoT and Robotics Engineering
4	**Pre-requisite Course(s)**	: basic data structures, computer organization, and a high-level programming language such as Java, C, C++, or Python

PART B: Course Details

1. **Course Content (As approved by the Academic Council)**

    Introduction and overview of Database Management System,

    Relational Model and SQL: Introduction to the Relational Model, Introduction to SQL, Intermediate SQL, Advanced SQL;

    Database Design: Database Design Using the E-R Model, Relational Database Design,

    Application Design and Development: Complex Data Types, Application Development;

    Storage Management and Indexing: Physical Storage Systems, Data Storage Structures, Indexing

    Big Data Analytics: Big Data, Data Analytics

    Query Processing and Optimization: Query Processing, Query Optimization,

    Transaction Management: Transactions, Concurrency Control, Recovery System;

    Parallel and Distributed Databases: Database-System Architectures, Parallel and Distributed Storage, Parallel and Distributed Query Processing, Parallel and Distributed Transaction Processing

2. **Course Objectives**

The students are expected to:

    1. Understand the concept of Computing Problem Solving technique and Programming language

2. Develop the programs to solve numerical and computing problems

3. Understand the syntax of the structured programming language

4. Analyze the errors in writing programs

5. Understand the technique of storing data in the file media and manipulating the data to generate formatted results.

6. Evaluate the efficiency of a program in solving problems

3. Knowledge required

Technical: Introductory knowledge of Computers is required. Knowledge of any high-level programming language
Mathematics: Set, Function, Relation

4. Course Outcomes (COs)

CO No.	CO Statement After undergoing this course, students should be able to:	Corresponding PO(s)*	Domains and Taxonomy level(s)**	Delivery Method(s) and Activity(-ies)	Assessment Tool(s)
CO1	To be able to employ analytical abilities to map out the conceptual design for real-world problems and develop database documentation, including data standards, processes, and data dictionary definitions.	PO(a), PO(b), PO(e) and PO(g)	C4, A1, P1	Lecture	Class Tests or Projects in CSE 201/4254, and Exam
CO2	To be able to build a Relational Database model using the Entity Relationship (ER) model as well as explain the basic features of a Database Management System.	PO(c)	C3, C5, P4	Lecture, Demonstration, and hands-on	Class Tests or Projects in CSE 201/4254, and Exam
CO3	To be able to analyze the logical architecture in order to transform it into a specific data model and to fulfill system storage needs.	PO(a)	C3, A1, A5	Lecture	Class Tests or Projects in CSE 201/4254, and Exam
CO4	To be able to assess MSSQL/MySQL/Oracle/Postgre sql/ Cassandra features and related solutions for enterprise database integrity and performance.	PO(d)	C5, A2, P3, P6	Lecture, Demonstration, and hands-on	Class Tests or Projects in CSE 201/4254, and Exam in 4253/4254, and Final Exam

*Program Outcomes (POs)

PO(a): Engineering knowledge; PO(b): Problem analysis; PO(c): Design/development of solutions; PO(d): Investigation; PO(e): Modern tool usage; PO(f): The engineer and society; PO(g): Environment and sustainability; PO(h): Ethics; PO(i): Individual work and teamwork; PO(j): Communication; PO(k): Project management and finance; PO(l): Life-long learning.

**Domains

C-Cognitive: C1: Knowledge; C2: Comprehension; C3: Application; C4: Analysis; C5: Synthesis; C6: Evaluation
A-Affective: A1: Receiving; A2: Responding; A3: Valuing; A4: Organizing; A5: Characterizing
P-Psychomotor: P1: Perception; P2: Set; P3: Guided Response; P4: Mechanism; P5: Complex Overt Response; P6: Adaptation; P7: Organization

5.   Lecture/ Activity Plan

Week	Topic	Course Outcomes
1	Introduction and overview of Database Management System, Introduction to Relational Languages	CO1
2	Introduction to SQL,	CO4
3	Intermediate SQL	CO4
4	Advanced SQL;	CO4
5	Database Design Using the E-R Model,	CO2
6	Relational Database Design,	CO2
7	Complex Data Types,	CO1
8	Application Development;	CO2
9	Physical Storage Systems,	CO3
10	Data Storage Structures	CO3
11	Indexing	CO3
12	Big Data, Data Analytics	CO1
13	Query Processing, Query Optimization	CO4
14	Transactions,	CO4

6. Assessment Strategy

- Class Attendance (10%(I,e 30)): Class attendance will be recorded in every class.
- Class Tests/Assignments/Projects:

  A: Assignments (15%(I,e. 45)): You need to select any three of the topics to accomplish three sets of assignment. Total marks will be: 3*15=45.

  B: Quiz/Class Test (5%(I,e, 15)): There will be 14 quizzes based on the contents of the class lecture. Moodle will be used for quiz. Total marks of all quizzes will be summed and then normalized on the scale of 0 to 15.

  C: Database Design Project (10%(I,e, 30)): You need to select a real-world scenario of your interest and consult with your course teacher and design a database with the aid of the tools you have learned in this course. (You need to implement the complete system in the sessional.)

- Midterm exam(24%(I,e 72)): A midterm exam will be held at the mid of the semester as per the institutional ordinance.
- Final exam(36(I,e 108)): A comprehensive Final exam will be held at the end of the semester as per the institutional ordinance.

7. Distribution of Marks

Attendance:	10 %
Class Tests/Assignments/Projects:	30%
Mid Term Exam:	24%
Final Exam:	36%
Total:	100%

8. Textbook/ Reference

1. **Database System Concepts;** *Seventh Edition;* **Avi Silberschatz**, **Henry F. Korth**, **S. Sudarshan**
2. Introduction to Database Management Systems: 1/e Author   Kahate, Atul

Course Teacher(s):

Name:	Office/Room:	E-mail and Telephone:
Mahir Mahbub	403, Academic Building	mahbub0001@bdu.ac.bd, 01732687621