

Database Systems					
Credit Hours:	3	Course Code:	COSC-2103	Prerequisites:	None
Course Learning Outcomes(CLOs):					
After the completion of this course the student should be able to:				Domain	BT Level
1. Explain fundamental database concepts.				C	2
2. Design conceptual, logical and physical database schemas using different data models.				C	3
3. Identify functional dependencies and resolve database anomalies by normalizing database tables.				C	4
4. Using Structured Query Language (SQL) for database definition and manipulation in any DBMS.				C	4
* BT= Bloom’s Taxonomy, C=Cognitive Domain, P=Psychomotor Domain, A=Affective Domain					
#	SDG	Relevant CLOs			
1	SDG 4: Quality Education	CLO 1: Using Structured Query Language (SQL) for database definition and manipulation in any DBMS.			
2	SDG17: Partnerships for the Goals	CLO 2: Design conceptual, logical and physical database schemas using different data models.			
3	SDG 9: Industry, Innovation and Infrastructure	CLO 3: Identify functional dependencies and resolve database anomalies by normalizing database tables.			
Course Contents:					
Basic database concepts, Database approach vs. file based system, database architecture, three level schema architecture, data independence, relational data model, attributes, schemas, tuples, domains, relation instances, keys of relations, integrity constraints, relational algebra, selection, projection, Cartesian product, types of joins, normalization, functional dependencies, normal forms, entity relationship model, entity sets, attributes, relationship, entity-relationship diagrams, Structured Query Language (SQL), Joins and subqueries in SQL, Grouping and aggregation in SQL, concurrency control, views, indexes, constraints in SQL.					
Teaching Methodology:					
Lectures, Power Point Slides, Interactive Sessions, Extra Material, Projects, Presentations					
Course Assessment:					
Sessional, Midterm Exam, Quizzes, Assignments, Presentation, Final Exam					
Reference Material:					
1. Database Systems: Design, Implementation & Management by Thomas Connolly and Steven Morris, Cengage Learning, 13 th Edition, 2018; ISBN-10: 1337627909					
2. Modern database management by Jeffrey A. Hoffer, Ramesh Venkataraman and Heikki Topi, Pearson, 11 th Edition, 2012; ISBN-10: 0132662256.					
3. Database system concepts by Abraham Silberschatz, Henry Korth and S. Sudarshan, McGraw-Hill Education, 6 th Edition, 2010; ISBN-10: 0073523321					

Database Systems - Lab					
Credit Hours:	1	Course Code:	COSC-2103	Prerequisites:	None
Course Learning Outcomes(CLOs):					
After the completion of this course the student should be able to:				Domain	BT Level
1. Explain fundamental database concepts.				C	2
2. Design conceptual, logical and physical database schemas using different data models.				C	3
3. Identify functional dependencies and resolve database anomalies by normalizing database tables.				C	4
4. Using Structured Query Language (SQL) for database definition and manipulation in any DBMS.				C	4
* BT= Bloom’s Taxonomy, C=Cognitive Domain, P=Psychomotor Domain, A=Affective Domain					
#	SDG	Relevant CLOs			
1	SDG 4: Quality Education	CLO 1: Using Structured Query Language (SQL) for database definition and manipulation in any DBMS.			
2	SDG17: Partnerships for the Goals	CLO 2: Design conceptual, logical and physical database schemas using different data models.			
3	SDG 9: Industry, Innovation and Infrastructure	CLO 3: Identify functional dependencies and resolve database anomalies by normalizing database tables.			
Course Contents:					
Databases, SQL Server, T-SQL & PL-SQL, History of SQL, SQL Server Instances, Introduction to SQL Server Graphical User Interface (GUI), Data Definition Language(DDL), Creating Database using query, Create, Alter, Drop table using Query, Sql Constraints on Columns & Tables, Table Level Constraint, Data Manipulation Language(DML), DML Queries, Select Query, Calculated Fields, Use of As & Where, Search with comparison Operators, Use of Between/Not Between, Use of IN / NOTIN, Use of LIKE/NOTLIKE, Use of IS NULL/IS NOT NULL, AND & OR Operator, Auto increment field in SQL Server, ORDER BY Clause, Single Column, Multiple Column, SQL Aggregate Functions, Sub Queries, Types of Sub queries, Querying Multiple Tables, Table Aliases, Joins, Inner Join, Adding Additional Clauses, SELECT INTO Statement, Union, Intersect, Except Query, Roll back or Commit transaction, Stored Procedures, Views, Indexes, Back up a Database, Restore a Database, Database Triggers.					
Teaching Methodology:					
Lectures, Power Point Slides, Interactive Sessions, Extra Material, Projects, Presentations					
Course Assessment:					
Sessional, Midterm Exam, Quizzes, Assignments, Presentation, Final Exam					
Reference Material:					
1. Microsoft SQL Server 2019, A Beginner's Guide by Dusan Petkovic, 7 th Edition, 2020.					
2. Database Systems: Design, Implementation & Management by Thomas Connolly and Steven Morris, Cengage Learning, 13 th Edition, 2018; ISBN-10: 1337627909					
3. Modern database management by Jeffrey A. Hoffer, Ramesh Venkataraman and Heikki Topi, Pearson, 11 th Edition, 2012; ISBN-10: 0132662256.					
4. Database system concepts by Abraham Silberschatz, Henry Korth and S. Sudarshan, McGraw-Hill Education, 6 th Edition,					

