Database Systems

Course Name: Database Systems
Course Code: ITF302
Credit hours: 3
Knowledge Domain: IT foundations
Prerequisite(s): Algorithms and Data Structures (SFT206)

Learning Objectives

Upon completion of this course, the student will be able to:

1. Present the basic database models: The relational and object-oriented.
2. Model using E-R and UML models.
3. Grasp the basic aspects of database design and administration.

Learning Outcomes

1. Grasping the main aspects of relational database models and SQL.
2. Using UML for modeling and grasping basic design concepts and normalization of relations.

Overview and Syllabus

File systems and databases. The Relational Database Model. Structured Query Language (SQL). Entity-Relationship (E-R) Modeling. Normalization of Database Tables. Database design. Object-Oriented Databases. Unified Modeling Languages (UML). Database Administration.

Course Outline

	Topic
1	**Module 01: Database System Introduction** Introduction Objectives **Lesson 01:** Introduction And Conceptual Modeling Databases And Database Users **Lesson 02:** Database System Concepts And Architecture **Lesson 03:** Centralized And Client-Server DBMS Architectures Summary Assessment
2	**Module 02: Data Modeling** Introduction Objectives **Lesson 01:** Data Modeling Using The Entity-Relationship Model

	Lesson 02: Relational Model: Concepts, Constraints, Languages, Design, And Programming **Lesson 03:** Relational Database Design By ER-To-Relational Mapping Summary Assessment
3	**Module 03: SQL (Structured Query Language)** Introduction Objectives **Lesson 01:** Schema Definition And Constraints **Lesson 02:** Retrieve Operations **Lesson 03:** Update Operations And Views **Lesson 04:** Introduction To SQL Programming Techniques Summary Assessment
4	**Module 04: Functional Dependencies and Normalization for Relational Databases** Introduction Objectives **Lesson 01:** Informal Design Guidelines For Relational Databases **Lesson 02:** Functional Dependencies **Lesson 03:** Normalization For Relational Databases Summary Assessment
5	**Module 05: Transaction Processing Concepts And Data Protection** Introduction Objectives **Lesson 01:** Transaction Processing Concepts **Lesson 02:** Recovery **Lesson 03:** Concurrency **Lesson 04:** Security Summary Assessment
6	**Module 06: Object and Object-Relational Databases** Introduction Objectives **Lesson 01:** Concepts For Object Databases **Lesson 02:** Unified Modeling Language (Uml) **Lesson 03:** Object-Oriented Database Languages Summary Assessment