Course Title	**Database Systems**		
Course Code	**CC-215**		
Credit Hours	3 (3,0)		
Category	Computing Core		
Prerequisite	None		
Co-Requisite	None		
Follow-up			
Course Introduction	The course aims to introduce basic database concepts, different data models, data storage and retrieval techniques and database design techniques. The course primarily focuses on relational data model and DBMS concepts		
Course Learning Outcomes (CLOs)	At the end of the course, the students will be able to:	**BT**	**PLO**
	CLO1: To understand the basic concepts of database systems and Database System environment.	C2 (Understand)	1
	CLO2: To develop strong concepts of data modeling techniques	C2 (Understand)	1,2
	ClO3: Understanding of database design phases and techniques for performance improvement	C2 (Understand)	1,2
	CLO4: To understand the concept of transaction management, concurrency control, database recovery, and distributed databases	C2 (Understand)	1,2
	CLO5: To learn SQL and develop expertise in writing SQL queries	C3 (Apply)	3,4,5
	CLO6: To develop the fundamental knowledge of PL/SQL, stored procedures, and database triggers	C3 (Apply)	3,4,5
	CLO7: To be able to design a database system for small business organizations	C5 (Design)	3,4,5,7
Course Description	**File Systems and Databases:** Introduction, A File system Critique, Database Systems, Database approach vs file-based system, database architecture, three level schema architecture, data independence, Database Models. **Introduction to RDBMS:** Logical view of Data; Entities and Attributes, Tables and their Characteristics, Keys; relational data model, attributes, schemas, tuples, domains, relation instances, keys of relations, integrity constraints. **Relational Algebra:** Relational Database Operators, selection, projection, Cartesian product, types of joins. **Entity Relationship (E-R) Modeling:** Basic Modeling Concepts, entity sets, attributes, relationship, entity-relationship diagrams, **Normalization of Database Tables:** Objectives, Forms, Normalization and Database Design, functional dependencies, normal forms, Denormalization, **Structured Query Language (SQL):** Introduction, DDL Commands, Joins and subqueries in SQL, Grouping and aggregation in SQL, DML Commands, DCL Commands, Complex Queries and SQL Functions, Procedural SQL; Triggers, Stored procedures. **Database Design:** The System Development Life Cycle (SDLC), The Database Life Cycle (DBLC), Database Design Strategies, **Transaction Management and Concurrency Control:** Introduction, Transaction Properties and Types, Concurrency Control Issues, Database Recovery Management. **DDBMS:** Evolution, Components, Distributed processing and distributed databases, Distributed database transparency features. Distributed database design, Data fragmentation, Data replication, NoSQL systems.		

Text Book(s)	1. Carlos Coronel, Steven Morris, Database Systems: Design, Implementation & Management, 13th Edition, Cengage Learning, 2017. ISBN-10: 1337627909.
Reference Material	1. Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi, Modern Database Management, 12th Edition, Pearson, 2015. ISBN-10: 0133544613. 2. Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to Design, Implementation and Management, 6th Edition, Pearson, 2015. ISBN-10: 1292061189. 3. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems, 7th Edition, Pearson, 2016. ISBN-10: 1292097612.