



COURSE DETAILS

Course Title	Database Systems		
Course Code	SET211	Credit Hours	2+1
Faculty	Engineering and Technology		
Department	Engineering Technology		
Semester	III	Domain / Knowledge Area	Foundation
Course Outline			
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, relational calculus, selection, projection, Cartesian product, types of joins, normalization, functional dependencies, entity relationship model, entity sets, attributes, relationship, entity-relationship diagrams, Structured Query Language (SQL), Joins and sub-queries in SQL, Grouping and aggregation in SQL, concurrency control, database backup and recovery, indexes. Processing techniques and cost estimation, Introduction to front end and back-end Database Systems. Database Security & integrity, Query Optimization, NoSQL systems.			
Lab Outline			
Basic Database Concepts: Traditional File Processing Systems, Integrated Database Environment, , Conceptual Modeling: File Organization, Relational Data Structures, Representing Relational Database Schemes, Relational Data Manipulation Languages the SQL language, Data Definition, Data Manipulation, Table Expressions, Conditional Expressions, Scalar Expressions, Normalization, , Functional Dependency, Super keys, Candidate Keys, Primary Keys. Inference Rules, First Normal Form, Full Functional Dependency, Second Normal Form, Transitive Dependency, Third Normal Form, Boyce-Codd Normal Form, Integrity Rules,, Transaction Management, Recovery Techniques, Database Security & Integrity: Database Security, Physical Security and User Authentication, Authorization, Access Control, Using Views for Access Control, Security Logs, Audit Trails, Encryption, Integrity Constraints, Query Optimization: Interpretation and Optimization of Queries, Algebraic Techniques for Query Transformation.			
Course Learning Outcomes (CLOs)			
CLO No.	CLO Description	Domain and Taxonomy level	PLO mapped (i to xii)
1	Explain fundamental database concepts.	C2	I
2	Apply conceptual, logical and physical database schemas using different data models.	C3	ii
3	Apply functional dependencies and resolve database anomalies by normalizing database tables.	C3	I
4	Apply Structured Query Language (SQL) for database definition and manipulation in any Database Management System DBMS.	C3	iii
Recommended Books			
<ol style="list-style-type: none"> 1. Coronel, Carlos, and Steven Morris. Database systems: design, implementation, & management. Cengage Learning, 2016. 2. Kim, Won, David S. Reiner, and Don Batory, eds. Query processing in database systems. Springer Science & Business Media, 2012. 3. Elmasri, Ramez, and Sham Navathe. Fundamentals of database systems. Vol. 7. Pearson, 2017. 4. Elmasri, Ramez, and Shamkant B. Navathe. Database systems. Vol. 9. Boston, MA: Pearson Education, 2011. 5. Pavlo, Andrew, et al. "Self-Driving Database Management Systems." CIDR. Vol. 4. 2017. 			