21IOT01	FUNDAMENTAL OF DATABASE MANAGEMENT SYSTEMS	L	T	P	C
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Course Objectives

- To learn data models, conceptualize and depict a database system using ER diagram
- To understand the internal storage structures in a physical DB design
- To know the fundamental concepts of transaction processing techniques

UNIT I	INTRODUCTION	9 Hours

Purpose of Database System - Views of data - data models - database management system - three-schema architecture of DBMS - components of DBMS - E/R Model - Conceptual data modelling - motivation - entities - entity types - attributes - relationships - relationship types - E/R diagram notation - examples.

UNIT II	RELATIONAL MODEL	9 Hours

Relational Data Model - Concept of relations - schema-instance distinction - keys - referential integrity and foreign keys - relational algebra operators - SQL - Introduction - data definition in SQL - table - key and foreign key definitions - update behaviours - Querying in SQL - notion of aggregation - aggregation functions groupby and having clauses - embedded SQL.

UNIT III	DATABASE DESIGN	9 Hours

Dependencies and Normal forms - dependency theory - functional dependencies - Armstrong's axioms for FD's - closure of a set of FD's - minimal covers - definitions of 1NF - 2NF - 3NF and BCNF - decompositions and desirable properties - algorithms for 3NF and BCNF normalization - 4NF and 5NF.

UNIT IV	TRANSACTIONS	9 Hours

Transaction processing and Error recovery - concepts of transaction processing - ACID Properties – concurrency control - locking based protocols for CC - error recovery and logging - undo - redo - undo-redo logging and recovery methods.

UNIT V	ADVANCED TOPICS	9 Hours

Distributed Databases: Architecture, Data Storage, Transaction Processing – Object-based Databases: Object Database Concepts, Object-Relational features, ODMG Object Model, ODL, OQL – XML Databases: XML Hierarchical Model, DTD, XML Schema, XQuery – Information Retrieval: IR Concepts, Retrieval Models, Queries in IR systems.

Course Outcomes:

- Install, configure, and interact with a relational database management system
- Master the basics of SQL and construct queries using SQL
- Design and develop a large database with optimal query processing

Text books:

1. Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Fifth Edition, Tata McGraw Hill, 2006.

2. J. Date, A. Kannan, S. Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.

Reference Books:

1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", FourthEdition, Pearson/Addision Wesley, 2007.

2. Raghu Ramakrishnan, "Database Management Systems", Third Edition, McGraw Hill, 2003.

3. S. K. Singh, "Database Systems Concepts, Design and Applications", First Edition, Pearson Education, 2006.