

Advanced Database Concepts

Code	Credit Hours
CS 820	3+0

Course Description

The course focuses generally on the advanced concepts prevail in databases. This course covers: files storage and structures; indexing and hashing, query processing component of a relational database system; Fundamental knowledge of transaction processing i.e., concurrency control and database recovery; NoSQL Database, Fundamental knowledge of XML/JSON data management and its query languages. The objective of the course is to familiarize students with the concepts and applications of advanced techniques in database systems, Students can apply advanced database concepts for complex issues and manage and manipulate advanced database processing.

Text Book:

1. Database System Concepts, Seventh Edition, Avi Silberschatz, Henry F. Korth,S. Sudarshan, 2019, McGraw-Hill
2. MongoDB in Action, second Edition, Manning publications, 2016
3. GraphDatabases in Action, Examples in Gremlin, Manning publications, 2020

Reference Book:

1. Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufmann Publishers, ISBN 1-55860-489-8

Prerequisites

Nil

ASSESSMENT SYSTEM FOR THEORY

Quizzes	10%
Assignments	10%
Mid Terms	30%
ESE	50%

ASSESSMENT SYSTEM FOR LAB

Lab Work and Report	Nil
Project	Nil

Teaching Plan

Week No	Topics	Learning Outcomes
1	Introduction	Relational Database Fundamentals
2		Relational Algebra, SQL, Normalization,
3		Amalgamation of Databases in today modern applications
4	Data Retrieval	Disk Storage and Basic File Structure
5		Hashing and Indexing Techniques
6		Hashing and Indexing Techniques
7	Processing	Query Processing
8		Query Processing
9	Mid Term	
10	Optimization	Query Optimization
11		Query Optimization
12	TCL	Transaction Management
13	CCL	Concurrency Control
14		Concurrency Control
15	Graph Theory	Link Analysis: AVL tree, Graph Theory (SMT, Single source shortest path)
16		Link Analysis: Graph Theory (Floyd - Warshall Algorithm, Bellman- Ford Algorithm), Information infusion
17	ESE	