

Department Of Computer Science and Engineering
Kathmandu University
Dhulikhel, Kavre



Subject: Database Management System

Course: COMP 232

Level: B.E./B.Sc 2nd Year 2nd Semester

Credit Hours: 3

Course Objective:

To make the student able to understand the concept of the database. To make the student able to design, analysis and implement the database system

Contents:

1. **Introduction:** Database Systems Applications, Database System versus File systems, View of Data, Database Languages, Database Users and Administrators, Transaction Management, Database Architecture. **[3 Hrs.]**
2. **Database Design:** Design Process, Entity Relationship Model, Constraints, Keys, Entity-Relationship Diagram, Design Issues, Weak Entity Sets, Extended E-R features, Design of an E-R Database Schema, Reduction of an E-R Schema to tables. **[6 Hrs.]**
3. **Relational Model:** The Relational Algebraic Operations, Operation on basic SQL and intermediate SQL. **[9 Hrs.]**
4. **Relational Database Design:** Functional dependencies, trivial and non-trivial dependencies, closure of a set of functional dependencies, irreducible sets of dependencies, Lossless Decompositions, First Normal Form, Second Normal Forms, Third Normal Forms, Boyce-Codd Normal Form. **[6 Hrs.]**
5. **Transactions:** Transaction Concept, Transaction state, Implementation of Atomicity and Durability, Concurrent Executions, Serializability and its test, Recoverability. **[6 Hrs.]**
6. **Concurrency Control:** Concurrency Control techniques, Deadlock handling - detection and resolution **[6 Hrs.]**
7. **Database Recovery Techniques:** Database Failure and Recovery Concepts; Recovery Techniques based on Deferred and Immediate Update; Recovery with Concurrent Transactions. **[3 Hrs.]**
8. **New Trends in Database:** NoSQL database, NoSQL characteristics and its categories. Introduction to Graph database and Neo4j **[9 Hrs.]**

TEXT BOOKS:

1. Database Systems Concepts, 4th Edition, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill Higher Education ©2001, ISBN:0072283637
2. Database Management Systems, 2nd Edition, Raghu Ramakrishnan, Johannes Gehrke, McGraw-Hill, Inc. New York, NY, USA ©2000, ISBN:0072440422