CSC-401 Advanced Database Management System Syllabus
Tribhuvan University
Institute of Science and Technology
Soch College of Information Technology Bachelor of Science in Computer Science and Information Technology

Course Title: Advanced Database Management System
Course No: CSC-401---------- Full Marks: 60 + 20 +20
Credit Hours: 3 ---------- Pass Marks: 24 + 8 + 8
Nature of Course: Theory (3Hrs.) + Lab (3Hrs.)
Course Synopsis: To study the concept of advanced database techniques
Goals: To study the further advanced database techniques beyond the fundamental database techniques which were covered in the sophomore year (fourth semester) BSc. CSIT course, and thus to acquaint the students with some relatively advanced issues. At the end of the course students should be able to: critically assess new developments in database technology, Interpret and explain the impact of emerging database standards, Evaluate the contribution of database theory to practical implementations of database management systems

Course Contents:

Unit 1: The Relational Model of Data and RDBMS Implementation Techniques---------- 5 Hrs.
Theoretical concepts, Relational model conformity and Integrity, Advanced SQL programming, Query optimization, Concurrency control and Transaction management, Database performance tuning, Distributed relational systems and Data Replication, Security considerations

Unit 2: The Extended Entity Relationship Model and Object Model: ---------- 6 Hrs.
The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

Unit 3: Emerging Database Management System Technologies ---------- 18 Hrs.
Object Oriented database concepts; Object Relational database concepts; Active database concepts; Temporal database concepts; Spatial database concepts and architecture; Deductive databases and Query processing; Mobile Databases; Geographic Information Systems.

Unit 4: New database applications and environments ---------- 8 Hrs.
Data Warehousing and Data Mining, Multimedia; Mobility; Multidatabases; Native XML databases (NXD), Internet

Unit 5: Database Related Standards ---------- 8 Hrs.
SQL standards, SQL 1999, SQL:2003, Object Data Management Group (ODMG) version 3.0

standard, Standards for interoperability and integration e.g. Web Services, SOAP, XML related specifications, e.g. XQuery, XPath.

Laboratory Projects: The course involves a mini project using any one of the popular Commercial Object-Oriented DBMS software such as Oracle, MS SQL Server etc, along with any MVC software development framework.

Reference Books:

1. Elmasri and Navathe, Fundamentals of Database Systems, Pearson Education
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, McGraw-Hill
3. Korth, Silberchatz, Sudarshan , Database System Concepts, McGraw-Hill.
4. Peter Rob and Coronel, Database Systems, Design, Implementation and Management, Thomson Learning.
5. C. J. Date & Longman, Introduction to Database Systems, Pearson Education