Database Management Systems

Course # COMP 3082

Credits 6

Pre-requisites and Co-requisites: None

Course Description

The Database Management Systems course introduces fundamental concepts and practical applications of modern databases. It covers the relational model, SQL, and NoSQL databases, exploring essential topics like relational algebra, normalization, query optimization, and data indexing. Students learn about database design through ER modeling, understand transaction management, concurrency control, and database security. The course also delves into emerging trends such as NoSQL, big data, cloud databases, and blockchain-based systems. Through hands-on labs, students develop skills in using tools and technologies for designing, querying, and managing databases, preparing them for real-world database challenges in various industries.

Course Learning Outcomes

Upon completion of this course, students will be able to:

- Define fundamental concepts of database management systems, including relational and NoSQL databases, and explain their real-world applications.
- Apply SQL and relational algebra to design, query, and manipulate data in relational database systems.
- Design efficient database schemas using ER modeling, normalization techniques, and data modeling tools.
- Implement and evaluate indexing, optimization, and transaction management techniques to ensure database performance and reliability.
- Analyze and address database security concerns, including authentication, authorization, and protection against SQL injection.
- Explore emerging database technologies, such as big data, cloud databases, and blockchain systems, and assess their role in modern applications.

Course Assessments and Grading

Item	**Weight**
Class participation	10%
Quiz activities	15%
Assignments	15%
Mid exam	30%
Final exam	30%