

Database Management System

Duration: 30 Hours

Introduction to Databases and Transactions

- What is database system
- Purpose of database system
- View of data
- Relational databases
- Database architecture
- Transaction management

Data Models

- The importance of data models
- Basic building blocks
- Business rules
- The evolution of data models
- Degrees of data abstraction

Database Design , ER-Diagram and Unified Modeling Language

- Database design and ER Model: overview
- ER-Model
- Constraints
- ER-Diagrams
- ERD
- Issues
- Weak entity sets
- Codd's rules
- Relational Schemas
- Introduction to UML

Relational database model

- Logical view of data
- Keys
- Integrity rules

Relational Database design

- Features of good relational database design
- Atomic domain and Normalization (1NF, 2NF, 3NF, BCNF)

Relational Algebra and Calculus

- Relational algebra
- Introduction
- Selection and projection,
- Set operations
- Renaming
- Joins
- Division
- Syntax
- Semantics
- Operators
- Grouping and ungrouping
- Relational comparison

Calculus

- Tuple relational calculus
- Domain relational Calculus
- Calculus vs algebra
- Computational capabilities

Constraints, Views and SQL

- What is constraints?
- Types of constrains
- Integrity constraints

Views

- Introduction to views
- Data independence
- Security,
- Updates on views
- Comparison between tables and views

SQL

- Data definition
- Aggregate function
- Null Values
- Nested sub queries
- Joined relations
- Triggers

Transaction management and Concurrency control

- Transaction Management
- ACID properties
- Serializability and concurrency control
- Lock based concurrency control (2PL, Deadlocks)
- Time stamping methods
- Optimistic methods
- Database recovery management