**GenAI TRAININGS**

WhatsApp/ Tel: +1-929-672-1814
Email: hr@genai-training.com
www.genai-training.com

**Course Title**
Database Management Course

**Course Level**
Beginner to Intermediate

**Delivery Mode**
Hybrid / Onsite + Online LMS Support

**Course Overview**
This course provides practical training in relational database management systems (RDBMS) using platforms such as MS SQL Server, MySQL, Oracle Database, and IBM DB2. Participants will learn how to design, implement, query, and manage databases used in real-world applications.

The program focuses on SQL programming, database design principles, normalization techniques, transaction management, stored procedures, and database administration practices. Students will gain hands-on experience working with multiple database systems while learning how to develop efficient queries and maintain secure database environments.

By the end of the course, learners will be able to design relational databases, write advanced SQL queries, manage database transactions, implement stored procedures and triggers, and perform essential database administration tasks aligned with industry best practices.

**Intended Audience**
This course is suitable for:
• Software engineering students
• Aspiring database developers
• Data analysts and data professionals
• Junior developers working with data systems
• IT professionals interested in database management and administration

**Prerequisites**
• Basic understanding of programming concepts
• Logical reasoning and problem-solving skills
• Familiarity with basic data structures is beneficial
• Laptop with minimum Intel i5 processor and 8GB RAM
• Required database software installed for practice

**Course Outline (Modules & Topics)**
**Module 1: Introduction to Databases**
**Topics:**
• Introduction to databases and data management concepts
• Importance of databases in modern applications

WhatsApp/ Tel: +1-929-672-1814
Email: hr@genai-training.com
www.genai-training.com

- Types of databases (relational vs non-relational)
- Relational Database Management Systems (RDBMS)
- Database architecture and components
- SQL overview and database query language
- Database development lifecycle
- Real-world applications of databases

## Module 2: SQL Fundamentals
**Topics:**
- Introduction to Structured Query Language (SQL)
- SQL syntax and data types
- Data Definition Language (DDL) commands (CREATE, ALTER, DROP)
- Data Manipulation Language (DML) commands (INSERT, UPDATE, DELETE)
- SELECT queries and filtering data
- Sorting and limiting results
- Basic joins and relationships between tables
- Working with database tables and records

## Module 3: Advanced SQL Queries
**Topics:**
- Complex join operations
- Nested queries and subqueries
- Set operations (UNION, INTERSECT, EXCEPT)
- Aggregate functions and grouping data
- GROUP BY and HAVING clauses
- Window functions and analytical queries
- Indexing concepts for query optimization
- Writing efficient SQL queries for real-world scenarios

## Module 4: Database Design & Normalization
**Topics:**
- Database design principles
- Entity Relationship (ER) modeling
- Creating relational schemas
- Primary keys and foreign keys
- Relationships between database tables
- Normalization techniques (1NF, 2NF, 3NF, BCNF)
- Denormalization concepts and performance considerations
- Designing databases for real-world applications

## Module 5: Stored Procedures, Functions & Triggers
**Topics:**
- Introduction to stored procedures

WhatsApp/ Tel: +1-929-672-1814
Email: hr@genai-training.com
www.genai-training.com

- Creating and executing stored procedures
- User-defined functions in databases
- Triggers and automated database actions
- Cursors and iterative operations
- Error handling in SQL procedures
- Writing reusable database logic
- Managing complex database operations

## Module 6: Transactions & Concurrency Control
**Topics:**
- Introduction to database transactions
- ACID properties in database systems
- Transaction management techniques
- Isolation levels and concurrency control
- Locking mechanisms in databases
- Commit and rollback operations
- Deadlock detection and resolution
- Maintaining database consistency and reliability

## Module 7: Database Administration & Security
**Topics:**
- Introduction to database administration
- Managing database users and roles
- Access control and privilege management
- Database security best practices
- Backup and recovery strategies
- Database monitoring and performance tuning
- Maintaining database availability and reliability
- Data protection and compliance considerations

## Module 8: Capstone Project & Certification Preparation
**Topics:**
- End-to-end database system development
- Database schema design for applications
- Writing advanced SQL queries for real datasets
- Implementing stored procedures and transactions
- Performance optimization and indexing strategies
- Preparing for database certification exams
- Interview preparation and technical assessments

## Capstone Project: Database Application Development
During the final phase of the course, participants will work on a real-world database project that integrates database design, SQL query development, stored procedures, and transaction

WhatsApp/ Tel: +1-929-672-1814
Email: hr@genai-training.com
www.genai-training.com

management. Students will design and implement a database system for a sample application, analyze datasets, and demonstrate their ability to manage and optimize database systems in practical environments.

**Assessment & Evaluation**
**Assessment will include:**
• SQL quizzes and assignments
 • Practical database lab exercises
 • Project-based evaluations
 • Database design tasks
 • Mock certification exams and technical interview preparation