



TECHNOCATION FREELANCING TRAINING INSTITUTE & SOFTWARE HOUSE

Professional MySQL Course Outline

Module 1: Introduction to MySQL & Databases

- What is MySQL? (Features & Benefits)
 - Understanding Relational Databases (RDBMS vs. NoSQL)
 - Installing & Setting Up MySQL (Windows, Mac, Linux)
 - MySQL Workbench & Command Line Basics
 - Connecting MySQL with PHP, Python, and Other Languages
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Module 2: MySQL Database Design & Architecture

- Database Structures (Tables, Rows, Columns)
 - Data Types in MySQL (VARCHAR, INT, TEXT, DATE, ENUM, etc.)
 - Primary Keys, Foreign Keys & Constraints
 - Normalization & Database Design Best Practices
 - Indexing for Performance Optimization
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Module 3: MySQL Querying – SQL Basics

- Writing SQL Queries (SELECT, INSERT, UPDATE, DELETE)
 - Filtering Data with WHERE, LIKE, BETWEEN, IN
 - Sorting & Limiting Results (ORDER BY, LIMIT, OFFSET)
 - Aggregate Functions (COUNT (), SUM (), AVG (), MAX (), MIN ())
 - Grouping Data with GROUP BY & HAVING
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Module 4: Advanced SQL Queries & Joins

- Understanding Relationships Between Tables
 - Using `INNER JOIN`, `LEFT JOIN`, `RIGHT JOIN`, `FULL JOIN`
 - Subqueries & Nested Queries
 - Using `UNION`, `INTERSECT`, and `EXCEPT`
 - Common Table Expressions (CTE)
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Module 5: MySQL Stored Procedures & Functions

- Creating & Using Stored Procedures (`CREATE PROCEDURE`)
 - Writing Custom Functions (`CREATE FUNCTION`)
 - Working with Triggers for Data Integrity
 - Transactions (`COMMIT`, `ROLLBACK`, `SAVEPOINT`)
 - Event Scheduling in MySQL
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Module 6: Database Security & User Management

- Creating & Managing Users (`CREATE USER`, `GRANT`, `REVOKE`)
 - Role-Based Access Control (RBAC)
 - Securing MySQL Against SQL Injection
 - Using Encryption & Hashing for Data Security
 - Backup & Restore Strategies (`mysqldump`, `mysqlimport`)
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Module 7: Performance Optimization & Indexing

- Understanding Indexes & Their Impact (`PRIMARY`, `UNIQUE`, `FULLTEXT`)
 - Query Optimization & Execution Plans (`EXPLAIN`)
 - Caching Strategies for Faster Performance
 - Partitioning Large Tables for Scalability
 - Monitoring & Profiling MySQL Performance
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Module 8: Working with MySQL & PHP/Python

- Connecting MySQL with PHP (`mysqli`, `PDO`)
- Using MySQL with Python (`MySQL Connector`, `SQLAlchemy`)
- Fetching & Displaying Data in Web Applications
- Building a CRUD Application (Create, Read, Update, Delete)

- Handling User Input Securely
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Module 9: MySQL & Big Data Integration

- MySQL vs. NoSQL (When to Use Which)
 - Integrating MySQL with MongoDB & Elasticsearch
 - Working with MySQL in Cloud Environments (AWS RDS, Google Cloud SQL)
 - MySQL & Business Intelligence (BI) Tools
 - Real-World Case Studies on Large-Scale Databases
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Module 10: Real-World Projects & Deployment

- Designing & Implementing a Blogging Platform
- Building an E-Commerce Database with MySQL
- Creating a Data Analytics Dashboard
- Deploying MySQL Databases to Cloud Hosting
- MySQL Maintenance & Troubleshooting Best Practices