MySQL Syllabus

1 Introduction to MySQL

- **What is MySQL?**
    - Installation and setup (XAMPP, WAMP, or standalone MySQL)
    - MySQL Workbench overview
    - Basics of relational databases
    - Understanding databases, tables, and relationships

2 Basic SQL Queries

- Basic syntax of SQL
- SELECT, WHERE, and filtering data
- Sorting data using ORDER BY
- Using LIMIT

3 Working with Tables

- Creating tables (CREATE TABLE)
- Data types in MySQL
- Inserting data (INSERT INTO)
- Updating data (UPDATE)
- Deleting data (DELETE)

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4 Constraints and Keys

- Primary keys and foreign keys
- Constraints: NOT NULL, UNIQUE, DEFAULT, CHECK
- Altering table structure (ALTER TABLE)

5 Joins and Relationships

- Introduction to joins
- Inner join, left join, right join, and full join
- Joining multiple tables
- Relationships: one-to-one, one-to-many, many-to-many

6 Advanced Querying

- Aggregate functions: SUM(), AVG(), COUNT(), MAX(), MIN()
- Grouping data using GROUP BY
- Filtering groups with HAVING

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7 Subqueries and Nested Queries

- Writing subqueries in SELECT, FROM, and WHERE
- Correlated subqueries
- Using subqueries for data extraction

8 Indexing and Performance Optimization

- Understanding indexes
- Creating and dropping indexes
- Impact of indexing on query performance
- Analyzing query execution (EXPLAIN)

9 Views and Stored Procedures

- Creating and using views
- Modifying and dropping views
- Introduction to stored procedures
- Creating and executing stored procedures

10 Triggers and Events

- What are triggers?
- Creating and managing triggers
- Scheduled events in MySQL
- Use cases for triggers and events

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11 Transactions and Error Handling

- Understanding transactions
- COMMIT, ROLLBACK, and SAVEPOINT
- Managing transactions for data consistency
- Error handling in MySQL

12 User Management and Security

- Creating and managing users
- Granting and revoking privileges
- Database backup and restoration
- Security best practices

13 Advanced Topics

- JSON data in MySQL.
- Full-textsearch
- Partitioning tables
- Working with large datasets.

14 MySQL with Programming Languages

- Connecting MySQL to Python or Java
- Executing queries through code
- CRUD operations programmatically
- Error handling in applications

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15 Project and Expert Techniques

- Design and implement a real-world database project
- Normalization techniques (1NF, 2NF, 3NF)
- Best practices for designing scalable databases
- Final review and Q&A