**MySql DB Administration (4 days)**
**By Dr. Vishwanath Rao**

**Module 1: Introduction to MySQL and Database Administration**

- Overview of MySQL and its features
- Importance of database administration
- Setting up a MySQL environment
- Basic MySQL commands and syntax
- Creating and managing databases, users, and permissions

**Module 2: MySQL Database Design and Modeling**

- Introduction to database design principles
- Entity-relationship modeling
- Normalization and denormalization
- Database schema design
- Creating and managing database tables, indexes, and relationships

**Module 3: MySQL Query Language (SQL)**

- Introduction to SQL and its syntax
- SELECT statements: filtering, sorting, and grouping data
- INSERT, UPDATE, and DELETE statements: managing data
- JOINs and subqueries: combining data from multiple tables
- Aggregate functions: SUM, COUNT, AVG, MAX, MIN
- Grouping and sorting data: GROUP BY and ORDER BY

**Module 4: MySQL Indexing and Optimization**

- Introduction to indexing and its importance
- Types of indexes: B-tree, hash, full-text
- Creating and managing indexes
- Indexing strategies: single-column, multi-column, composite
- Query optimization techniques: using indexes, rewriting queries
- MySQL query profiler: analyzing query performance

**Module 5: MySQL Security and Backup**

- MySQL security best practices: user authentication, password management
- Creating and managing users and permissions
- Granting and revoking privileges
- MySQL backup and recovery strategies: full, incremental, differential backups
- MySQL replication and clustering: high availability and disaster recovery

**Module 6: MySQL Performance Tuning and Monitoring**

- MySQL performance tuning: adjusting variables, optimizing queries
- MySQL monitoring tools: MySQL Workbench, MySQL Query Browser
- MySQL performance metrics: CPU, memory, disk usage
- MySQL troubleshooting techniques: identifying and resolving performance issues

**Module 7: MySQL Storage Engines and File Systems**

- Introduction to MySQL storage engines: InnoDB, MyISAM, MEMORY
- Choosing the right storage engine for your database
- MySQL file systems: InnoDB, MyISAM, and other storage engines
- MySQL storage engine configuration: adjusting variables and settings

**Module 8: MySQL Replication and Clustering**

- MySQL replication: master-slave, multi-master, and semi-synchronous replication
- MySQL clustering: Galera, MySQL Cluster, and other clustering solutions
- MySQL replication and clustering best practices: setting up and managing replication and clustering
- MySQL replication and clustering troubleshooting: identifying and resolving issues

**Module 9: MySQL Backup and Recovery**

- MySQL backup strategies: full, incremental, differential backups
- MySQL recovery strategies: restoring from backups, recovering from errors
- MySQL backup and recovery best practices: setting up and managing backups and recovery
- MySQL backup and recovery troubleshooting: identifying and resolving issues

**Module 10: MySQL Advanced Topics**

- MySQL advanced query techniques: window functions, common table expressions
- MySQL advanced indexing techniques: covering indexes, index hints
- MySQL advanced security techniques: encryption, access control
- MySQL advanced performance tuning techniques: query optimization, caching

**Module 11: MySQL Case Studies and Projects**

- Real-world case studies: applying MySQL skills to real-world scenarios
- Project-based learning: designing and implementing a MySQL database
- MySQL troubleshooting and debugging: identifying and resolving issues
- MySQL best practices: following best practices for MySQL administration

**Module 12: MySQL Certification and Career Development**

- MySQL certification: preparing for the MySQL certification exam
- MySQL career development: building a career in MySQL administration
- MySQL job roles and responsibilities: database administrator, data analyst, data scientist
- MySQL salary and benefits: compensation and benefits for MySQL professionals