**COURSE OUTLINE🔷**

**SQL Server Administration & Optimization – Class Flow**

**1. Introduction to SQL Server Administration**

* Overview of SQL Server components
* Role of a DBA: Security, performance, availability, automation

**2. Backup, Recovery, and Disaster Planning**

* Backup Types: Full, Differential, Transaction Log
* Recovery Models: Simple, Full, Bulk-Logged
* Restore Strategies:
  + Point-in-time recovery
  + Tail-log backup
* Disaster Recovery Methods:
  + Always On Availability Groups
  + Log Shipping
  + 7

**3. Indexing and Query Optimization**

* Index Types: Clustered vs Non-Clustered
* Index Maintenance:
  + Rebuild vs Reorganize
* Advanced Tuning:
  + Index Usage Analysis
  + Statistics & Cardinality Estimations
  + Execution Plans
  + Query Store & Performance Baselines

**4. Monitoring & Troubleshooting**

* SQL Server Logs & Error Logs
* Performance Counters & DMVs
* Query Performance & Bottleneck Identification

**5. Automation and Maintenance**

* SQL Server Agent:
  + Jobs, Alerts, Operators
* Maintenance Plans:
  + Backups
  + Integrity Checks
  + Index Maintenance
* Scripting Tools:
  + PowerShell
  + T-SQL

**6. Security, Compliance, and Auditing**

* Authentication & Authorization
* Row-level & Column-level Security
* Encryption:
  + TDE (Transparent Data Encryption)
  + Always Encrypted
* Auditing:
  + SQL Server Audit
  + Extended Events
  + Policy-Based Management
* Compliance Frameworks: GDPR, HIPAA basics

**7. Storage & File Management**

* Data Files & Filegroups
* TempDB Management Best Practices
* Table Partitioning

**8. Cloud & Hybrid Deployments**

* Azure SQL Database
* Managed Instance
* SQL Server on Azure VM
* Backup to Azure Blob Storage
* Migration Tools:
  + DMA (Data Migration Assistant)
  + DMS (Database Migration Service)