**DBA Challenges**

🕒 Each lecture is 1.5 hours.  
📅 Weekly 2 lectures (around 6 weeks total).

# Lecture 0: Microsoft C# scripting power

⏰ Duration: 1.5 hours | 📅 Week 0

Microsoft Visual Studio Tool (Free)  
C# complete guidance to writing scripting.  
Windows scheduler.

# Lecture 1: Bulk Data Load & ETL Optimization

⏰ Duration: 1.5 hours | 📅 Week 1

Issue: Slow bulk inserts/updates in huge tables.  
C# Power: SqlBulkCopy (SQL Server) / COPY API wrappers (Postgres).  
Costing: Faster ingestion = less CPU, less I/O billing in cloud DBs.

# Lecture 2: Connection Pooling & High-Concurrency Control

⏰ Duration: 1.5 hours | 📅 Week 1

Issue: DB throttling at 1000s of connections.  
C# Power: DbContextPooling in EF Core, Npgsql connection multiplexing.  
Costing: Reduce over-provisioning of DB instances.

# Lecture 3: Query Performance Monitoring with C# Dashboards

⏰ Duration: 1.5 hours | 📅 Week 2

Issue: DBAs struggle with spotting bad queries.  
C# Power: Build monitoring dashboards using Dapper/EF + Grafana APIs.  
Costing: Prevent wasted CPU/RAM due to long-running queries.

# Lecture 4: Indexing Strategy & Auto-Suggestions via C# Tools

⏰ Duration: 1.5 hours | 📅 Week 2

Issue: Wrong/missing indexes → slow queries.  
C# Power: Build index advisor using EXPLAIN PLAN + C# parser.  
Costing: Saves cloud DB IO/CPU usage.

# Lecture 5: Database Partitioning & Archiving

⏰ Duration: 1.5 hours | 📅 Week 3

Issue: Large tables (50M+ rows) → updates/deletes crawl.  
C# Power: Write background services (Quartz.NET/Hangfire) to partition/archive.  
Costing: Lowers storage + compute bills.

# Lecture 6: Deadlock & Lock Escalation Detection

⏰ Duration: 1.5 hours | 📅 Week 3

Issue: Queries block each other in OLTP workload.  
C# Power: Auto-detect via DB pg\_locks/sys.dm\_tran\_locks → alert via C# worker service.  
Costing: Prevent downtime → business continuity.

# Lecture 7: Backup & Restore Automation with C# Jobs

⏰ Duration: 1.5 hours | 📅 Week 4

Issue: Manual backups = human error, high downtime.  
C# Power: Scheduler in .NET Core to trigger pg\_dump, sqlpackage, etc.  
Costing: Automates backups → saves DBA effort, reduces risk penalties.

# Lecture 8: Audit Logging & Compliance

⏰ Duration: 1.5 hours | 📅 Week 4

Issue: GDPR/PCI DSS → DBAs must log data access.  
C# Power: Middleware intercepting queries, logging into secure store.  
Costing: Compliance = saves from heavy penalties.

# Lecture 9: Cross-DB Migration & Schema Sync Tools

⏰ Duration: 1.5 hours | 📅 Week 5

Issue: Migrating from SQL Server → Postgres → Oracle.  
C# Power: C# migration scripts + EF Core scaffolding.  
Costing: Avoids expensive vendor migration tools.

# Lecture 10: Monitoring Cloud DB Costs with C# Agents

⏰ Duration: 1.5 hours | 📅 Week 5

Issue: DBA doesn’t see billing impact of poor queries.  
C# Power: Azure/AWS billing APIs + C# background service.  
Costing: Early warning for expensive queries before invoice shocks.

# Lecture 11: AI-Powered DBA Assistant (C# + GPT + DB)

⏰ Duration: 1.5 hours | 📅 Week 6

Issue: DBAs manually query writing.  
AI Power: Write big queries in minutes.  
Costing: Save your time.