SQL SCHOOL
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Complete Practical, Real-time Job Oriented Training

Azure Data Engineering

Thank you for contacting our **SQL School**. I am **Mr. Sai Phanindra**, trainer for this **Azure Data Engineer** Course. With 19+ Years of technical expertise exclusively on Database and Azure, BI Technologies, I assure you 100% Practical, Step by Step Classes for this in-depth Azure Data Engineer course. My Profile @ linkedin.com/in/saiphanindra/

Azure Data Engineer

- **Module 1: MSSQL, TSQL**
- **Module 2: Azure Data Factory, Synapse**
- **Module 3: Databricks with Python, PySpark**
- **Module 4: End to End Realtime Projects**
- **Module 5: Fabric Cloud, DWH & Migrations**

You can Skip Module 1 if you are aware of MSSQL.

My Azure Data Engineer Course is very helpful for:

- ✓ Data Engineers
- ✓ ETL Developers
- ✓ BI Developers
- ✓ Data Science Engineers
- ✓ Databricks Developers
- ✓ AI Engineers

🔥 Azure Data Engineer: Detailed Course Content 🔥

Module 1: SQL Server TSQL (MS SQL) Queries

Ch 1: Data Engineer Job Roles

- ✓ **Introduction to Data**
- ✓ **Data Engineer Job Roles**
- ✓ **Data Engineer Challenges**
- ✓ **Data and Databases Intro**

Ch 2: Database Intro & Installations

- ✓ Database Types (OLTP, DWH, ..)
- ✓ DBMS: Basics
- ✓ SQL Server 2025 Installations
- ✓ SSMS Tool Installation
- ✓ Server Connections, Authentications

Ch 3: SQL Basics V1 (Commands)

- ✓ Creating Databases (GUI)
- ✓ Creating Tables, Columns (GUI)
- ✓ SQL Basics (DDL, DML, etc..)
- ✓ Creating Databases, Tables
- ✓ Data Inserts (GUI, SQL)
- ✓ Basic SELECT Queries

Ch 4: SQL Basics V2 (Commands, Operators)

- ✓ DDL: Create, Alter, Drop, Add, modify, etc..
- ✓ DML: Insert, Update, Delete, select into, etc..
- ✓ DQL: Fetch, Insert... Select, etc..
- ✓ SQL Operations: LIKE, BETWEEN, IN, etc..
- ✓ Special Operators

Ch 5: Data Types

- ✓ Integer Data Types
- ✓ Character, MAX Data Types
- ✓ Decimal & Money Data Types
- ✓ Boolean & Binary Data Types
- ✓ Date and Time Data Types
- ✓ SQL_Variant Type, Variables

Ch 6: Excel Data Imports

- ✓ Data Imports with Excel
- ✓ SQL Native Client
- ✓ Order By: Asc, Desc
- ✓ Order By with WHERE
- ✓ TOP & OFFSET
- ✓ UNION, UNION ALL

Ch 7: Schemas & Batches

- ✓ Schemas: Creation, Usage
- ✓ Schemas & Table Grouping
- ✓ Real-world Banking Database
- ✓ 2 Part, 3 Part & 4 Part Naming
- ✓ Batch Concept & “Go” Command

Ch 8: Constraints, Keys & RDBMS – Level 1

- ✓ Null, Not Null Constraints
- ✓ Unique Key Constraint
- ✓ Primary Key Constraint
- ✓ Foreign Key & References
- ✓ Default Constraint & Usage
- ✓ DB Diagrams & ER Models

Ch 9: Normal Forms & RDBMS – Level 2

- ✓ Normal Forms: 1 NF, 2 NF
- ✓ 3 NF, BCNF and 4 NF
- ✓ Adding Keys to Tables
- ✓ Cascading Keys
- ✓ Self Referencing Keys
- ✓ Database Diagrams

Ch 10: Joins & Queries

- ✓ Joins: Table Comparisons
- ✓ Inner Joins & Matching Data
- ✓ Outer Joins: LEFT, RIGHT
- ✓ Full Outer Joins & Aliases
- ✓ Cross Join & Table Combination
- ✓ Joining more than 2 tables

Ch 11: Views & RLS

- ✓ Views: Realtime Usage
- ✓ Storing SELECT in Views
- ✓ DML, SELECT with Views
- ✓ RLS: Row Level Security
- ✓ WITH CHECK OPTION
- ✓ Important System Views

Ch 12: Stored Procedures

- ✓ Stored Procedures: Realtime Use
- ✓ Parameters Concept with SPs
- ✓ Procedures with SELECT
- ✓ System Stored Procedures
- ✓ Metadata Access with SPs
- ✓ SP Recompilations

Ch 13: User Defined Functions

- ✓ Using Functions in MSSQL
- ✓ Scalar Functions in Real-world
- ✓ Inline & Multiline Functions
- ✓ Date & Time Functions
- ✓ String Functions & Queries
- ✓ Aggregated Functions & Usage

Ch 14: Triggers & Automations

- ✓ Need for Triggers in Real-world
- ✓ DDL & DML Triggers
- ✓ For / After Triggers
- ✓ Instead Of Triggers
- ✓ Memory Tables with Triggers
- ✓ Disabling DMLs & Triggers

Ch 15: Transactions & ACID

- ✓ Transaction Concepts in OLTP
- ✓ Auto Commit Transaction
- ✓ Explicit Transactions
- ✓ COMMIT, ROLLBACK
- ✓ Checkpoint & Logging
- ✓ Lock Hints & Query Blocking
- ✓ READPAST, LOCKHINT

Ch 16: CTEs & Tuning

- ✓ Common Table Expression
- ✓ Creating and Using CTEs
- ✓ CTEs, In-Memory Processing
- ✓ Using CTEs for DML Operations
- ✓ Using CTEs for Tuning
- ✓ CTEs: Duplicate Row Deletion

Ch 17: Indexes Basics, Tuning

- ✓ Indexes & Tuning
- ✓ Clustered Index, Primary Key
- ✓ Non Clustered Index & Unique
- ✓ Creating Indexes Manually
- ✓ Composite Keys, Query Optimizer
- ✓ Composite Indexes & Usage

Ch 18: Group By Queries

- ✓ Group By, Distinct Keywords
- ✓ GROUP BY, HAVING
- ✓ Cube( ) and Rollup( )
- ✓ Sub Totals & Grand Totals
- ✓ Grouping( ) & Usage
- ✓ Group By with UNION
- ✓ Group By with UNION ALL

Ch 19: Joins with Group By

- ✓ Joins with Group By
- ✓ 3 Table, 4 Table Joins
- ✓ Join Queries with Aliases
- ✓ Join Queries & WHERE, Group By

- ✓ Joins with Sub Queries
- ✓ Query Execution Order

Ch 20: Sub Queries

- ✓ Sub Queries Concept
- ✓ Sub Queries & Aggregations
- ✓ Joins with Sub Queries
- ✓ Sub Queries with Aliases
- ✓ Sub Queries, Joins, Where
- ✓ Correlated Queries

Ch 21: Cursors & Fetch

- ✓ Cursors: Realtime Usage
- ✓ Local & Global Cursors
- ✓ Scroll & Forward Only Cursors
- ✓ Static & Dynamic Cursors
- ✓ Fetch, Absolute Cursors

Ch 22: Window Functions, CASE

- ✓ IIF Function and Usage
- ✓ CASE Statement Usage
- ✓ Window Functions (Rank)
- ✓ Row_Number( )
- ✓ Rank( ), DenseRank( )
- ✓ Partition By & Order By

Ch 23: Merge (Upsert) & CASE, IIF

- ✓ Merge Statement
- ✓ Upsert Operations with Merge
- ✓ Matched and Not Matched
- ✓ IIF & CASE Statements
- ✓ Merge Statement inside SPs
- ✓ Merge with OLTP & DWH

Ch 24: Key Take-Aways from Module 1

- ✓ Case Study 1: Medicare Scenario
- ✓ Case Study 2: Ecommerce Scenario

Module 2: Azure Data Engineer (ADF, Synapse)

Ch 1: Azure ETL, DWH Introduction

- ✓ Data Warehouse (DWH)
- ✓ Cloud Concepts: IaaS, PaaS
- ✓ SaaS & Azure Cloud Concepts
- ✓ Azure Resources & Groups
- ✓ Storage, ETL, IoT Resources

Ch 2: Azure Intro, Azure SQL

- ✓ Azure SQL Server, SQL DB
- ✓ Azure SQL Database (OLTP)
- ✓ Azure SQL Pool (DWH)
- ✓ Connections from SSMS Tool
- ✓ Connections from ADS Tool
- ✓ Pause / Resume SQL Pool
- ✓ Source Data Configurations

Ch 3: Azure Synapse (DWH)

- ✓ Synapse Pool Architecture
- ✓ Control Node, Compute Node
- ✓ DMS & Partitioned Tables
- ✓ Creating Tables with TSQL
- ✓ Distributions: RR, Hash, Repl
- ✓ Big Data Loads with TQL
- ✓ Important DMFs & DMVs

Ch 4: Azure Data Factory (ADF)

- ✓ Need for ADF & Pipelines
- ✓ Data Orchestration with IR
- ✓ Integration Runtime Engine
- ✓ Linked Services, Datasets
- ✓ Pipelines: Copy Data Activity
- ✓ Data Flow Activity with IR

Ch 5: Azure SQL DB Loads

- ✓ ADF: Author
- ✓ Azure SQL Database Reads
- ✓ Azure SQL Pool Writes
- ✓ Synapse Analytics with IR
- ✓ Pipeline Design, Validation
- ✓ Pipeline Runs, Monitoring

Ch 6: BLOB Data Loads

- ✓ Azure Storage Account
- ✓ Azure BLOB Containers
- ✓ BLOB Storage in ADF
- ✓ Synapse Analytics with IR
- ✓ ADF Pipeline Edits
- ✓ Pipeline Runs, Monitoring

Ch 7: Pipeline Settings

- ✓ ADF Pipeline Settings
- ✓ Staging : Advantages
- ✓ Reliable Logging
- ✓ Best Effort Logging
- ✓ DIU & DOCP with IR
- ✓ Compressions, Health Check

Ch 8: File Incremental Loads

- ✓ File Incremental Loads
- ✓ Storage Account, Data Lake
- ✓ Binary Copy, Schema Drift
- ✓ Staging Concept in ADF
- ✓ Initial, Incremental Loads
- ✓ Schema & Data Changes

Ch 9: Table Incremental Loads

- ✓ Implement SCD with ADF
- ✓ Self Hosted IR: Realtime Use
- ✓ On-premise Data: Incr Loads
- ✓ Copy Method: Upsert, Keys
- ✓ Staging & ADF Optimizations
- ✓ Pipeline Runs, Activity IDs

Ch 10: ADF Data Flow - 1

- ✓ Data Flow Transformations
- ✓ Spark Clusters for Debugging
- ✓ Optimized Clusters, Preview
- ✓ Conditional Split, SELECT
- ✓ Sort, Union Transformations
- ✓ Pipelines with Data Flow

Ch 11: ADF Data Flow - 2

- ✓ Working with Multiple Tables
- ✓ Join Transform, Broadcast
- ✓ Row Filters, Column Filters
- ✓ Surrogate Keys, Derived Cols
- ✓ ETL Loads Dates, Sink Options
- ✓ Aggregated Data Loads

Ch 12: ADF Data Flow - 3

- ✓ Pivot Transformation
- ✓ Group By & Pivot Keys
- ✓ Column Pattern, Deduplicate
- ✓ Lookup, Cached Lookup

- ✓ Tuning Transformations
- ✓ Tuning Data Flow, Spark

Ch 13: ADF Data Flow - 4

- ✓ Lookup Transformation
- ✓ Cache Lookup
- ✓ Inline Datasets
- ✓ Data Validations
- ✓ Lookup Versus Joins
- ✓ Broadcast Options

Ch 14: ADF Metrics, Alerts

- ✓ Azure Insights
- ✓ Azure Metrics for ADF
- ✓ Azure Metrics for Synapse
- ✓ CPU, Memory Metrics
- ✓ Alerts and Notifications
- ✓ Action Groups, Tuning Options

Ch 15: ADF Parameters, Security

- ✓ Linked Service Parameters
- ✓ Creating Logins
- ✓ Users and ETL Permissions
- ✓ Parameterize Logins
- ✓ Parameterize Users
- ✓ Dynamic Linked Services

Ch 16: Parameters, SCD & ETL

- ✓ ADF Templates in Realtime
- ✓ Implementing ADF SCD
- ✓ Table Incremental Loads
- ✓ Control Tables, Watermarks
- ✓ Pipeline Parameters, SPs
- ✓ Dynamic Data Sets, SCD

Ch 17: Synapse Analytics

- ✓ Azure Synapse Analytics
- ✓ Dedicated SQL Pools
- ✓ TSQL: Stored Procedures
- ✓ Synapse Pipelines, Tuning
- ✓ SP Activity in Pipelines, Jobs
- ✓ Comparing ADF & Synapse

Ch 18: CI CD with GitHub

- ✓ Creating Github Account
- ✓ GIT: Main, Branches
- ✓ Connecting with ADF
- ✓ Version Changes
- ✓ Builds and Deployments
- ✓ CI-CD Integrations

Ch 19: Azure Storage Security, ADF

- ✓ Access Keys & Admin Access
- ✓ SAS Keys Generation, Ips
- ✓ Azure AD Users, Groups
- ✓ IAM & RBAC with Entra Users
- ✓ ACLs and ADLS Security
- ✓ ADF with Azure Storage Security

Ch 20: Azure SQL DB Migrations

- ✓ On-Premise SQL DB bacpac
- ✓ Azure SQL Deployment
- ✓ Azure Storage from SSMS
- ✓ Azure SQL DB Migration
- ✓ Migration Verifications
- ✓ Testing Migrations in SQL

Ch 21: Azure Tables & ADF

- ✓ Azure Tables
- ✓ Entities and Properties
- ✓ Storage Service Operations
- ✓ OData Queries & Filters
- ✓ Data Loads with ADF

Ch 22: Azure Stream Analytics

- ✓ Azure IoT Hubs & Devices
- ✓ APIs with Connection Strings
- ✓ Azure Steam Analytic Jobs
- ✓ Inputs, Outputs, SAQL Query
- ✓ LIVE Feed: JSON, AVRO Files
- ✓ Watermark & LIVE Streams

Ch 23: Azure Key Vaults

- ✓ Azure Encryptions at REST
- ✓ SMK & CMK Encryptions
- ✓ Azure Key Vaults & Keys
- ✓ Key Access Policies
- ✓ Rest, Transit Encryptions

- ✓ **Realtime Considerations**

Ch 24: Realtime Project 1 @ Ecommerce / Banking / Sales

- ✓ Detailed Project Requirement
- ✓ Project Solutions, Project FAQs
- ✓ Interview Questions & Answers
- ✓ Resume Guidance (1:1)

Module 3: Azure Data Engineer (Databricks with Auto Loader, DLT, PySpark)

Ch 1: Databricks Introduction

- ✓ Cloud ETL, DWH
- ✓ Cloud Computing
- ✓ Databricks Concepts
- ✓ Big Data in Cloud

Ch 2: Databricks Architecture

- ✓ Unity Catalog, Volume
- ✓ Spark Clusters
- ✓ Apache Spark and Databricks
- ✓ Apache Spark Ecosystem
- ✓ Compute Operations
- ✓ Hadoop, MapReduce, Apache Spark

Ch 3: Unity Catalog

- ✓ Unity Catalog Concepts
- ✓ Workspace Objects
- ✓ Databricks Notebooks
- ✓ Databricks Workspace UI
- ✓ Organizing Workspace Objects
- ✓ Creating Volumes
- ✓ Spark Table Creations
- ✓ UI : Limitations

Ch 4: Unity Catalog Operations, Spark SQL - 1

- ✓ Spark SQL Notebooks
- ✓ Creating Catalog
- ✓ Creating Schemas, Tables
- ✓ Spark Data Types
- ✓ Data Partitioning
- ✓ Managed Tables
- ✓ SQL Queries with the PySpark API
- ✓ Union, Views in Spark
- ✓ Dropping Objects
- ✓ External Tables, External Volumes
- ✓ Spark SQL Notebooks: Exports, Clone

Ch 5: Spark SQL Notebooks - 2

- ✓ Math, Sort Functions
- ✓ String, DateTime Functions
- ✓ Conditional Statements
- ✓ SQL Expressions with expr()
- ✓ Volume for our Data Assets
- ✓ File Formats, Schema Inference
- ✓ Spark SQL Aggregations

Ch 6: Python Concepts - 1

- ✓ Python Introduction
- ✓ Python Versions
- ✓ Python Implementations
- ✓ Python in Spark (PySpark)
- ✓ Python Print()
- ✓ Single, Multiline Statements

Ch 7: Python Concepts - 2

- ✓ Python Data Types
- ✓ Integer / Int Data Types
- ✓ Float, String Data Types
- ✓ Arithmetic, Assignment Ops
- ✓ Comparison Operators
- ✓ Operator Precedence
- ✓ If ... Else Statement
- ✓ Short Hand If, OR, AND
- ✓ ELIF and ELSE IF Statements

Ch 8: Python Concepts - 3

- ✓ Python Lists
- ✓ List Items, Indexes
- ✓ Python Dictionaries
- ✓ Tables Versus Dictionaries
- ✓ Python Modules & Pandas
- ✓ import pandas.DataFrame
- ✓ Pandas Series, arrays
- ✓ Indexes, Indexed Lists

Ch 9: PySpark - 1

- ✓ Dataframes with SQL DB
- ✓ Pandas Dataframes
- ✓ Dataframe()
- ✓ List Values, Mixed Values
- ✓ spark.read.csv()
- ✓ spark.read.format()
- ✓ Filtering DataFrames

- ✓ Grouping your DataFrame
- ✓ Pivot your DataFrame

Ch 10: PySpark - 2

- ✓ DataFrameReader
- ✓ DataFrameWriter Methods
- ✓ CSV Data into a DataFrame
- ✓ Reading Single Files
- ✓ Reading Multiple Files
- ✓ Schema with an SQL String
- ✓ Schema Programmatically

Ch 11: PySpark – 3

- ✓ Writing DataFrames to CSV
- ✓ Working with JSON
- ✓ Working with ORC
- ✓ Working with Parquet
- ✓ Working with Delta Lake
- ✓ Rendering your DataFrame
- ✓ Creating DataFrames from Python Data Structures

Ch 12: PySpark Transformations - 1

- ✓ Data Preparation
- ✓ Selecting Columns
- ✓ Column Transformations
- ✓ Renaming Columns
- ✓ Changing Data Types
- ✓ select() and selectExpr()
- ✓ Column Transformations
- ✓ withColumn()

Ch 13: PySpark Transformations - 2

- ✓ Basic Arithmetic and Math Functions
- ✓ String Functions
- ✓ Datetime Conversions
- ✓ Date and Time Functions
- ✓ Joining DataFrames
- ✓ Unioning DataFrames
- ✓ Joining DataFrames

Ch 14: PySpark Transformations - 3

- ✓ Filtering DataFrame Records
- ✓ Removing Duplicate Records
- ✓ Sorting and Limiting Records
- ✓ Filtering Null Values
- ✓ Grouping and Aggregating

- ✓ Pivoting and Unpivoting
- ✓ Conditional Expressions

Ch 15: **Medallion Architecture**

- ✓ Medallion Architecture
- ✓ Aggregated Data Loads
- ✓ Broze, Silver and Gold
- ✓ Temp Views
- ✓ Spark Tables (Parquet)
- ✓ Work with File, Table Sources

Ch 16: Delta Lake - 1

- ✓ Storage Layer
- ✓ Delta Table API
- ✓ Deleting Records
- ✓ Updating Records
- ✓ Merging Records
- ✓ History and Time Travel

Ch 17: Delta Lake – 2 (SCD)

- ✓ Schema Evolution
- ✓ Delta Lake Data Files
- ✓ Deleting and Updating Records
- ✓ Merge Into
- ✓ Table Utility Commands
- ✓ Exploratory Data Analysis
- ✓ Incremental Loads
- ✓ Old History Retention
- ✓ Delta Transaction Log

Ch 18: Widgets

- ✓ Text Widgets
- ✓ User Parameters
- ✓ Manual Executions
- ✓ Lake Bridge
- ✓ Databricks BridgeOne

Ch 19: Lake Flow Jobs

- ✓ Worksflows & CRON
- ✓ Job Compute, Running Tasks
- ✓ Python Script Tasks
- ✓ Parameters into Notebook Tasks
- ✓ Parameters into Python Script Tasks
- ✓ Concurrent Executions, Dependencies
- ✓ Branching Control with the If-Else Task

Ch 20: Databricks Tuning

- ✓ How Spark Optimizes your Code
- ✓ Lazy Evaluation
- ✓ Explain Plan
- ✓ Inspecting Query Performance
- ✓ Caching, Data Shuffling
- ✓ Broadcast Joins
- ✓ When to Partition
- ✓ Data Skipping
- ✓ Z Ordering
- ✓ Liquid Clustering
- ✓ Spark Configurations

Ch 21: Version Control & GitHub

- ✓ Local Development
- ✓ Runtime Compatibility
- ✓ Git and GitHub Pre-requisites
- ✓ Git and GitHub Basics
- ✓ Linking GitHub and Databricks
- ✓ Databricks Git Folders
- ✓ Project Code to GitHub
- ✓ Adding Modules to the Project Code
- ✓ Databricks Job Updates, Runs

Ch 22: Spark Structured Streaming

- ✓ Streaming Simulator Notebook
- ✓ Micro-batch Size
- ✓ Schema Inference and Evolution
- ✓ Time Based Aggregations and Watermarking
- ✓ Writing Streams
- ✓ Trigger Intervals
- ✓ Delta Table Streaming Reads and Writes

Ch 23: Auto Loader

- ✓ Reading Streams with Auto Loader
- ✓ Reading a Data Stream
- ✓ Manually Cancel your Data Streams
- ✓ Writing to a Data Stream
- ✓ Workspace Modules

Ch 24: Lake Flow Declarative Pipelines

- ✓ Delta LIVE Tables
- ✓ Data Generator Notebook
- ✓ Pipeline Clusters
- ✓ Databricks CLI
- ✓ Data Quality Checks

- ✓ Streaming Dataset "Simulator"
- ✓ Streaming Live Tables

Ch 25: Security: ACLs

- ✓ Overview of ACLs
- ✓ Adding a New User to our Workspace
- ✓ Workspace Access Control
- ✓ Cluster Access Control
- ✓ Groups & LakeBridge

Ch 26: Realtime Project 2 @ Ecommerce / Banking / Sales

- ✓ Detailed Project Requirements
- ✓ Project Solutions
- ✓ Project FAQs
- ✓ Project Flow
- ✓ Interview Questions & Answers
- ✓ Resume Guidance (1:1)

Module 4: Microsoft Fabric

- 👉 Microsoft Fabric Concepts
- 👉 Fabric Configurations
- 👉 Azure Versus Fabric Implementations
- 👉 Azure to Fabric Migrations