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VECTOR E

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# Data Integration & Analytics Training

## SQL, Power BI & ADF Curriculum

**Power BI – Introduction**

- Business Intelligence
- Power BI History and Introduction
- Power BI Desktop and User Interface
- Understanding Power Query, Power Pivot and Power View
- Components of Power BI
- Building Blocks of Power BI
- Power BI Workflow
- Understanding the Power BI architecture and components
- Installing and setting up Power BI Desktop
- Get Data from Various Data sources.
- Detailed Understanding about Import Mode, Direct Query Mode, and Live Connection
- Introduction to Power Query Editor
- ETL – Extract, Transform and Load
- Power Query User Interface
- The Queries Pane, Data view, Query Settings Pane, and Formula Bar
- Advanced Editor
- How to apply changes and Load to Power Pivot Model

# Data Modelling

- Overview of Data Modelling
- Relationships
- Cardinality
- Manage relationships.
- Normalization
- Active and Inactive Relationships
- Cross filter
- BI-Directional Relationship
- Role Playing Dimension
- Calendar or Date Table
- Date Table Using Power Query
- Date Table Using Power Query Script
- Date Table Using DAX
- Date Table Using DAX Script
- Calendar and Calendar Auto Functions

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# Data Transformation

- Get data from Various Data sources.
- Data source settings
- Deal with Queries
- Manage Columns and Reduce Rows, Sort Data
- Split Column in different ways, Group by
- Detect and change Data types.
- Create a table using Enter data.
- Table transformations
- Combine Files, Merge Queries and Append Queries.
- Move and Rename Columns
- Pivot and Unpivot Columns
- Fill up and Fill Down
- Replace Values and Errors
- Merge Columns
- Format and Extract Text
- Column From Examples
- Custom Column
- Invoke Custom Column
- Conditional Column
- Index Column
- Duplicate Column
- Add Column Functions related to Text, Number and Date & time.
- Parameter
- Column Quality
- Column Distribution
- Column Profile
- Query Dependencies
- Advanced Editor

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# DAX

- Introduction to DAX
- DAX Operators
- Types of Operators
- Calculated Columns
- Measures
- Implicit and Explicit Measures
- DAX Functions
- Aggregated Functions
- Date and Time Functions
- Information Functions
- Logical and Parent Child Functions
- Relationship and Text Functions
- Table Manipulation Functions
- Time Intelligence Functions
- New Calculation
- Quick Measure

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## Data Visualization

- Report View UI, Visual Interactions
- Filter Types, Slicers
- Grouping, Binning and Sorting
- Hierarchies , Drill Down and Drill Through
- Formatting
- Visualization of Categorical Data
- Visualization of Trend Data
- Visualization of KPI Data
- Visualization of Maps
- Custom Visualizations
- Best Practices

## Reporting - Projects

- Reports Creation
- Extraction, Transformation and Loading
- Data Modelling
- Visualization
- Formatting
- Publishing the report to Power Service
- Best Practices

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## Data Distribution – Power BI Service

- Power BI Service Introduction
- Interface and Sharing of Reports
- Score Card
- My Workspace
- Dashboard Creation
- Pin Visuals and Pin Live Pages
- Formatting and Sharing Dashboard
- Data Gateways
- Types of Gateways
- Roles in workspace
- Scheduled Refresh
- Scheduled Refresh using Power Automate

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# MS SQL Server

- SQL Server Introduction
- ER model & Relational model
- Databases, Schemas, and Tables
- Datatypes
- SQL Commands
- Keys and Constraints,
- Cascading referential integrity constraints
- Alter commands
- Identity, scope identity, ident current
- Joins
- Set operators Union, Union all, Intersect, Except
- Aggregation functions
- Group By, Having, Order By, Like operator
- Select into statement, insert into
- String functions, Date and time functions
- Subquery
- Exists and Not Exists

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# MS SQL Server

- CTE
- Views
- Temporary tables
- Stored procedures
- User defined functions
- Cross Apply and Outer apply
- Window functions
- Indexes
- Computed columns
- Transactions
- Try catch Blocks
- Cube, Rollup, and Grouping sets
- Case and When Statement
- Merge statement
- Cursors
- DDL Triggers and DML triggers

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# Big Data Concepts

- What is Big Data?
- The 4 Vs of Big Data: Volume, Velocity, Variety, and Veracity
- Importance of Big Data in modern business
- Introduction to Cloud
- Public vs Private vs Hybrid Clouds
- Database vs Data warehouse vs Data Lake vs Data Lakehouse

# Azure Data Factory

**1. Introduction to Azure Data Factory**

• Overview of Azure Data Factory (ADF)

• Key features and benefits

• Use cases and scenarios

•Hands-on Lab: Setting up your Azure Data Factory environment

**2. Different Kinds of Integration Runtimes**

• Definition and purpose of Integration Runtimes (IR)

• Types: Azure, Self-hosted, and Azure-SSIS Integration Runtime

• When and how to use each type

• Hands-on Lab: Setting up different types of Integration Runtimes

**3. Linked Services**

• What are Linked Services?

• How to create and manage Linked Services

• Examples of commonly used Linked Services

• Best practices for securing Linked Services

• Hands-on Lab: Creating and managing Linked Services

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**4. Data Sets**

• Definition and role of Data Sets in ADF

• How to create and configure Data Sets

• Examples and best practices

• Hands-on Lab: Creating and managing Data Sets

**5. Pipelines**

• Introduction to Pipelines

• Components of a Pipeline

• How to create and manage Pipelines

• Best practices for designing efficient Pipelines

• Hands-on Lab: Building your first Pipeline

**6. Parameters vs Variables**

• Differences between Parameters and Variables

• How and when to use Parameters and Variables

• Practical examples

• Hands-on Lab: Using Parameters and Variables in a Pipeline

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**7. Copy Data**

- Overview of the Copy Data tool
- Step-by-step guide to copying data
- Common scenarios and troubleshooting
- Hands-on Lab: Copying data between different data stores

**8. Data Flow Activity**

- Introduction to Data Flow in ADF
- Building and managing Data Flows
- Examples of Data Flow transformations
- Best practices for optimizing Data Flows
- Hands-on Lab: Creating a Data Flow with transformations

**9. Configure Azure Integration Runtime**

- Setting up Azure Integration Runtime
- Configuration options and best practices
- Common issues and resolutions
- Hands-on Lab: Configuring Azure Integration Runtime

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**10. Configure Self Hosted Integration Runtime**

- Overview of Self Hosted IR
- Steps to configure and manage Self Hosted IR
- Migration tips and tricks
- Hands-on Lab: Configuring Self Hosted Integration Runtime

**11. System Assigned and User Assigned Managed Identities**

- Explanation of Managed Identities
- Differences between System Assigned and User Assigned Managed Identities
- Implementation and use cases
- Hands-on Lab: Implementing Managed Identities in ADF

**12. Lookup and Metadata Activity**

- Introduction to Lookup and Metadata Activity
- How to configure and use these activities
- Practical examples
- Hands-on Lab: Using Lookup and Metadata Activity in Pipelines

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**13. For Each Activity**

• Understanding For Each Activity

• Configuration and use cases

• Best practices and examples

• Hands-on Lab: Implementing For Each Activity in a Pipeline

**14. Fail Over, Validate**

• Strategies for Failover in ADF

• Validation mechanisms and best practices

• Examples and common pitfalls

• Hands-on Lab: Implementing failover and validation in Pipelines

**15. IF, Switch, Until**

• Conditional activities in ADF: IF, Switch, Until

• How to configure and use each activity

• Practical scenarios and examples

• Hands-on Lab: Using IF, Switch, and Until activities in Pipelines

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**16. Set and Append Variable**

• Using Set and Append Variable activities

• Configuration and best practices

• Examples and use cases

• Hands-on Lab: Setting and appending variables in a Pipeline

**17. Stored Procedure**

• Executing Stored Procedures in ADF

• Configuration and usage

• Best practices and troubleshooting

• Hands-on Lab: Executing a Stored Procedure in a Pipeline

**18. Different Kinds of Triggers**

• Overview of Triggers in ADF

• Types: Schedule, Tumbling Window, Event-based

• How to create and manage Triggers

• Best practices for trigger management

• Hands-on Lab: Creating and managing different types of Triggers

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**19. Monitoring and Managing Pipelines**

• Tools for monitoring Pipelines

• Debugging and troubleshooting techniques

• Hands-on Lab: Monitoring and managing Pipeline runs

**20. Advanced Topics**

• Incremental data loading

• Handling schema changes

• Integration with other Azure services (e.g., Azure Synapse, Databricks)

• Hands-on Lab: Implementing an end-to-end data integration solution

**21. Power Query Activity**

• Introduction to Power Query in ADF

• Building and managing Power Query transformations

• Practical examples and use cases

• Best practices for using Power Query

• Hands-on Lab: Implementing Power Query transformations in a Pipeline

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**22. Real-world Case Studies**

- Case study 1: Data migration from on-premises to cloud
- Case study 2: Building a data warehouse with ADF
- Case study 3: Integrating ADF with other Azure services

**23. Best Practices**

- Design best practices for ADF
- Security best practices
- Performance optimization tips
- Troubleshooting common issues

**24. Additional Resources**

- Documentation and tutorials
- Blogs and articles
- Community forums and support

**25. Q&A Sessions**

- Regular Q&A sessions to address participant questions
- Dedicated time for troubleshooting and discussion

**26. Certification Preparation**

- Overview of relevant Azure certifications
- Study tips and resources
- Practice exams and sample questions

This comprehensive curriculum covers all essential aspects of Azure Data Factory, including advanced topics and hands-on practice.

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