

Course Name	Designing and Implementing Enterprise-Scale Analytics Solutions Using Microsoft Azure and Microsoft Power BI
Course Code	DP-500T00
Course Duration	4 Days
Course Structure	Instructor-Led
Course Overview	This course covers methods and practices for performing advanced data analytics at scale. Students will build on existing analytics experience and will learn to implement and manage a data analytics environment, query, and transform data, implement and manage data models, and explore and visualize data. In this course, students will use Microsoft Purview, Azure Synapse Analytics, and Power BI to build analytics solutions.
Audience Profile	Candidates for this course should have subject matter expertise in designing, creating, and deploying enterprise-scale data analytics solutions. Specifically, candidates should have advanced Power BI skills, including managing data repositories and data processing in the cloud and on-premises, along with using Power Query and Data Analysis Expressions (DAX). They should also be proficient in consuming data from Azure Synapse Analytics and should have experience querying relational databases, analyzing data by using Transact-SQL (T-SQL), and visualizing data.
Course Prerequisites	Before attending this course, it is recommended that students have: <ul style="list-style-type: none"> • A foundational knowledge of core data concepts and how they're implemented using Azure data services. For more information see Azure Data Fundamentals. • Experience designing and building scalable data models, cleaning and transforming data, and enabling advanced analytic capabilities that provide meaningful business value using Microsoft Power BI.
Course Outcome	After completing this course, students will be able to: <ul style="list-style-type: none"> • Explore Azure data services for modern analytics. • Understand concepts of data analytics • Explore data analytics at scale.

	<ul style="list-style-type: none">• Introduction to Microsoft Purview• Discover trusted data using Microsoft Purview• Catalog data artifacts by using Microsoft Purview• Manage Power BI assets by using Microsoft Purview• Integrate Microsoft Purview and Azure Synapse Analytics• Introduction to Azure Synapse Analytics• Use Azure Synapse serverless SQL pool to query files in a data lake.• Analyze data with Apache Spark in Azure Synapse Analytics• Analyze data in a relational data warehouse.• Choose a Power BI model framework.• Understand scalability in Power BI• Create and manage scalable Power BI dataflows.• Create Power BI model relationships.• Use DAX time intelligence functions in Power BI Desktop models.• Create calculation groups.• Enforce Power BI model security.• Use tools to optimize Power BI performance.• Understand advanced data visualization concepts.• Monitor data in real-time with Power BI• Create paginated reports.• Provide governance in a Power BI environment.• Facilitate collaboration and sharing in Power BI• Monitor and audit usage.• Provision Premium capacity in Power BI• Establish a data access infrastructure in Power BI• Broaden the reach of Power BI• Automate Power BI administration.• Build reports using Power BI within Azure Synapse Analytics• Design a Power BI application lifecycle management strategy.• Create and manage a Power BI deployment pipeline.• Create and manage Power BI assets
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Assessment/Evaluation	<p>This course will prepare delegates to take the DP-500: Designing and Implementing Enterprise-Scale Analytics Solutions Using Microsoft Azure and Microsoft Power BI exam.</p> <p>Successfully passing this exam will result in the attainment of the Designing and Implementing Enterprise-Scale Analytics Solutions Using Microsoft Azure and Microsoft Power BI Certification and Certificate of Attendance issued by IT-IQ Botswana.</p>
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Course Details	
Topic	<p>Topic 1: Explore Azure data services for modern analytics.</p> <p>Understand analytics solutions in the Azure data ecosystem. Explore the architecture of a scalable analytics solution to meet business needs.</p> <p>Learning objectives After completing this module, you will be able to:</p> <ul style="list-style-type: none"> • Describe the Azure data ecosystem for analytics. <p>Topic 2: Understand concepts of data analytics.</p> <p>Explore key concepts of data analytics, including types of analytics, data, and storage. Explore the analytics process and tools used to discover insights.</p> <p>Learning objectives After completing this module, you will be able to:</p> <ul style="list-style-type: none"> • Describe types of data analytics • Understand the data analytics process.

Topic 3: Explore data analytics at scale.

Describe data analytics at scale and understand the roles of a data team. Learn about the responsibilities of an enterprise data analyst and what tools are available to build scalable solutions.

Learning objectives

After completing this module, you will be able to:

- Explore data job roles in analytics.
- Understand tools for scaling analytics solutions.

Topic 4: Introduction to Microsoft Purview

In this module, you'll evaluate whether Microsoft Purview is the right choice for your data discovery and governance needs.

Learning objectives

By the end of this module, you'll be able to:

- Evaluate whether Microsoft Purview is appropriate for data discovery and governance needs.
- Describe how the features of Microsoft Purview work to provide data discovery and governance.

Topic 5: Discover trusted data using Microsoft Purview

Use Microsoft Purview Studio to discover trusted organizational assets for reporting.

Learning objectives

After completing this module, you'll be able to:

- Browse, search, and manage data catalog assets.
- Use data catalog assets with Power BI.
- Use Microsoft Purview in Azure Synapse Studio.

Topic 6: Catalog data artifacts by using Microsoft Purview

Register, scan, catalog, and view data assets and their relevant details in Microsoft Purview.

Learning objectives

By the end of this module, you'll be able to:

- Describe asset classification in Microsoft Purview.

Topic 7: Manage Power BI assets by using Microsoft Purview

Improve data governance and asset discovery using Power BI and Microsoft Purview integration.

Learning objectives

By the end of this module, you'll be able to:

- Register and scan a Power BI tenant.
- Use the search and browse functions to find data assets.
- Describe the schema details and data lineage tracing of Power BI data assets.

Topic 8: Integrate Microsoft Purview and Azure Synapse Analytics

Learn how to integrate Microsoft Purview with Azure Synapse Analytics to improve data discoverability and lineage tracking.

Learning objectives

After completing this module, you'll be able to:

- Catalog Azure Synapse Analytics database assets in Microsoft Purview.
- Configure Microsoft Purview integration in Azure Synapse Analytics.
- Search the Microsoft Purview catalog from Synapse Studio.
- Track data lineage in Azure Synapse Analytics pipelines activities.

Topic 9: Introduction to Azure Synapse Analytics

Learn about the features and capabilities of Azure Synapse Analytics - a cloud-based platform for big data processing and analysis.

Learning objectives

In this module, you'll learn how to:

- Identify the business problems that Azure Synapse Analytics addresses.
- Describe core capabilities of Azure Synapse Analytics.
- Determine when to use Azure Synapse Analytics.

Topic 10: Use Azure Synapse serverless SQL pool to query files in a data lake

With Azure Synapse serverless SQL pool, you can leverage your SQL skills to explore and analyze data in files, without the need to load the data into a relational database.

Learning objectives

After the completion of this module, you will be able to:

- Identify capabilities and use cases for serverless SQL pools in Azure Synapse Analytics
- Query CSV, JSON, and Parquet files using a serverless SQL pool
- Create external database objects in a serverless SQL pool

Topic 11: Analyze data with Apache Spark in Azure Synapse Analytics

Apache Spark is a core technology for large-scale data analytics. Learn how to use Spark in Azure Synapse Analytics to analyze and visualize data in a data lake.

Learning objectives

After completing this module, you will be able to:

- Identify core features and capabilities of Apache Spark.
- Configure a Spark pool in Azure Synapse Analytics.

- Run code to load, analyze, and visualize data in a Spark notebook.

Topic 12: Analyze data in a relational data warehouse

Relational data warehouses are a core element of most enterprise Business Intelligence (BI) solutions, and are used as the basis for data models, reports, and analysis.

Learning objectives

In this module, you'll learn how to:

- Design a schema for a relational data warehouse.
- Create fact, dimension, and staging tables.
- Use SQL to load data into data warehouse tables.
- Use SQL to query relational data warehouse tables.

Topic 13: Choose a Power BI model framework.

Describe model frameworks, their benefits and limitations, and features to help optimize your Power BI data models.

Learning objectives

By the end of this module, you'll be able to:

- Describe Power BI model fundamentals.
- Determine when to develop an import model.
- Determine when to develop a DirectQuery model.
- Determine when to develop a composite model.
- Choose an appropriate Power BI model framework.

Topic 14: Understand scalability in Power BI

Scalable data models enable enterprise-scale analytics in Power BI. Implement data modeling best practices, use large dataset storage format, and practice building a star schema to design analytics solutions that can scale.

	<p>Learning objectives By the end of this module, you'll be able to:</p> <ul style="list-style-type: none">• Describe the importance of building scalable data models.• Implement Power BI data modeling best practices.• Use the Power BI large dataset storage format. <p>Topic 15: Create and manage scalable Power BI dataflows.</p> <p>Create Power BI transformation logic for reuse across your organization with Power BI dataflows. Learn how to combine Power BI dataflows with Power BI Premium for scalable ETL, and practice creating and consuming dataflows.</p> <p>Learning objectives By the end of this module, you'll be able to:</p> <ul style="list-style-type: none">• Describe Power BI dataflows and use cases.• Describe best practices for implementing Power BI dataflows.• Create and consume Power BI dataflows. <p>Topic 16: Create Power BI model relationships.</p> <p>Power BI model relationships form the basis of a tabular model. Define Power BI model relationships, set up relationships, recognize DAX relationship functions, and describe relationship evaluation.</p> <p>Learning objectives By the end of this module, you'll be able to:</p> <ul style="list-style-type: none">• Understand how model relationship work.• Set up relationships.• Use DAX relationship functions.• Understand relationship evaluation.
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Topic 17: Use DAX time intelligence functions in Power BI Desktop models

By the end of this module, you'll learn the meaning of time intelligence and how to add time intelligence DAX calculations to your model.

Learning objectives

By the end of this module, you'll be able to:

- Define time intelligence.
- Use common DAX time intelligence functions.
- Create useful intelligence calculations.

Topic 18: Create calculation groups.

In this module you'll learn what calculation groups are, explore key features and usage scenarios, and learn to create calculation groups.

Learning objectives

After completing this module, you will be able to:

- Explore how calculation groups work.
- Maintain calculation groups in a model.
- Use calculation groups in a Power BI report.

Topic 19: Enforce Power BI model security.

Enforce model security in Power BI using row-level security and object-level security.

Learning objectives

By the end of this module, you'll be able to:

- Restrict access to Power BI model data with RLS.
- Restrict access to Power BI model objects with OLS.
- Apply good development practices to enforce Power BI model security.

	<p>Topic 20: Use tools to optimize Power BI performance.</p> <p>Use tools to develop, manage, and optimize Power BI data model and DAX query performance.</p> <p>Learning objectives After completing this module, you'll be able to:</p> <ul style="list-style-type: none">• Optimize queries using performance analyzer.• Troubleshoot DAX performance using DAX Studio.• Optimize a data model using Tabular Editor. <p>Topic 21: Understand advanced data visualization concepts.</p> <p>Create cohesive, inclusive, and efficient Power BI reports to effectively communicate results.</p> <p>Learning objectives In this module, you'll learn how to:</p> <ul style="list-style-type: none">• Create and import a custom report theme.• Create custom visuals with R or Python.• Enable personalized visuals in a report.• Review report performance using Performance Analyzer.• Design and configure Power BI reports for accessibility. <p>Topic 22: Monitor data in real-time with Power BI</p> <p>Describe real-time analytics in Power BI using automatic page refresh, real-time dashboards, and auto-refresh in paginated reports.</p> <p>Learning objectives By the end of this module, you'll be able to:</p> <ul style="list-style-type: none">• Describe Power BI real-time analytics.
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- Set up automatic page refresh.
- Create real-time dashboards.
- Set up auto-refresh paginated reports.

Topic 23: Create paginated reports.

Paginated reports allow report developers to create Power BI artifacts that have tightly controlled rendering requirements. Paginated reports are ideal for creating sales invoices, receipts, purchase orders, and tabular data. This module will teach you how to create reports, add parameters, and work with tables and charts in paginated reports.

Learning objectives

In this module, you will:

- Get data.
- Create a paginated report.
- Work with charts and tables on the report.
- Publish the report.

Topic 24: Provide governance in a Power BI environment.

Power BI governance is a set of rules, regulations, and policies that define and ensure the effective, controlled, and valuable operation of a BI environment. In this module, you'll learn the fundamental components and practices necessary to govern a Power BI tenant.

Learning objectives

In this module, you will:

- Define the key components of an effective BI governance model.
- Describe the key elements associated with data governance.
- Configure, deploy, and manage elements of a BI governance strategy.
- Set up BI help and support settings.

Topic 25: Facilitate collaboration and sharing in Power BI

You've created dashboards and reports. Perhaps you want to collaborate on them with your coworkers. Or maybe you're ready to distribute them more widely. What's the best way to collaborate and share them? In this module, we compare your options.

Learning objectives

In this module, you will:

- Understand the differences between My workspace, workspaces, and apps.
- Describe new workspace capabilities and how they improve the user experience.
- Anticipate migration impact to Power BI users.
- Share, publish to the web, embed links and secure Power BI reports, dashboards, and content.

Topic 26: Monitor and audit usage

Usage metrics help you understand the impact of your dashboards and reports. When you run either dashboard usage metrics or report usage metrics, you discover how those dashboards and reports are being used throughout your organization, who's using them, and for what purpose. Knowing who is taking what action on which item in your Power BI tenant can be critical in helping your organization fulfill its requirements, like meeting regulatory compliance and records management. This module outlines what is available in usage metrics reports and audit logs.

Learning objectives

In this module, you will:

- Discover what usage metrics are available through the Power BI admin portal.
- Optimize use of usage metrics for dashboards and reports
- Distinguish between audit logs and the activity logs.

Topic 27: Provision Premium capacity in Power BI

Power BI Premium is a dedicated, capacity-based offering. Learn about the differences between Power BI Pro and Power BI Premium, and how Power BI Premium manages capacity resources. Featured tools you can use with Power BI premium are also covered.

Learning objectives

By the end of this module, you'll be able to:

- Describe the difference between Power BI Pro and Power BI Premium
- Define dataset eviction.
- Explain how Power BI manages memory resources.
- List three external tools you can use with Power BI Premium.

Topic 28: Establish a data access infrastructure in Power BI

Working with on-premises data sources requires configuring a gateway between Power BI and the on-premises data source. This module examines how to work with gateways and SQL Server Analysis Services (SSAS) data sources that are used either for scheduled refresh or for live connections.

Learning objectives

By the end of this module, you'll be able to:

- Understand the difference between gateways, the various connectivity modes, and data refresh methods.
- Describe the gateway network requirements, where to place the gateway in your network, and how to use clustering to ensure high availability.
- Scale, monitor, and manage gateway performance and users.

Topic 29: Broaden the reach of Power BI

You can broaden the reach of Power BI by sharing your reports beyond your Power BI environment. You can publish reports to the public internet, embed reports in Microsoft Teams or in PowerApps, and place BI reports in a SharePoint online web part. There's also a special

version of Power BI service called Microsoft Power BI Embedded (PBIE) which allows application developers to embed fully interactive reports into their applications without having to build their own data visualizations and controls from scratch.

Learning objectives

By the end of this module, you'll be able to:

- Describe the various embedding scenarios that allow you to broaden the reach of Power BI
- Understand the options for developers to customize Power BI solutions.
- Learn to provision and optimize Power BI embedded capacity and create and deploy dataflows.
- Build custom Power BI solutions template apps.

Topic 30: Automate Power BI administration.

Cmdlets are functions written in PowerShell script language that execute commands in the Windows PowerShell environment. Running these cmdlets will allow you to interact with your Power BI Platform without having to go through the admin portal in a web browser. Combine these cmdlets with other PowerShell functions to write complex scripts that can optimize your workflow.

Learning objectives

By the end of this module, you'll be able to:

- Use REST APIs to automate common Power BI admin tasks.
- Apply Power BI Cmdlets for Windows PowerShell and PowerShell core.
- Use Power BI Cmdlets
- Automate common Power BI admin tasks with scripting.

Topic 31: Build reports using Power BI within Azure Synapse Analytics

In this module, you will learn how you can build Power BI reports from within Azure Synapse Analytics.

	<p>Learning objectives In this module, you will:</p> <p>Describe the Power BI and Synapse workspace integration. Understand Power BI data sources. Describe optimization options. Visualize data with serverless SQL pools.</p> <p>Topic 32: Design a Power BI application lifecycle management strategy.</p> <p>The use of OneDrive, Git repositories, and Power BI deployment pipelines allows us to follow application lifecycle management techniques. This reduces administrative overhead and provides continuity in the development process.</p> <p>Learning objectives Upon completion of this module, you should be able to:</p> <ul style="list-style-type: none">• Outline the application lifecycle process.• Choose a source control strategy.• Design a deployment strategy. <p>Topic 33: Create and manage a Power BI deployment pipeline. Deployment pipelines enable creators to develop and test Power BI content in the Power BI service before the content is made available for consumption by users. It offers creators improved productivity, faster delivery of content updates, and reduced manual work and errors. The tool is designed as a pipeline with three stages: development, test, and production.</p> <p>Learning objectives By the end of this module, you'll be able to:</p> <ul style="list-style-type: none">• Articulate the benefits of deployment pipelines.• Create a deployment pipeline using Premium workspaces.• Assign and deploy content to pipeline stages.• Describe the purpose of deployment rules.
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	<ul style="list-style-type: none">• Deploy content from one pipeline stage to another. <p>Topic 34: Create and manage Power BI assets.</p> <p>Creating shared data assets for your analytics environment provides structure and consistency. Maintaining those assets is as important, and XMLA endpoint provides additional administrative capabilities.</p> <p>Learning objectives Upon completion of this module, you should be able to:</p> <ul style="list-style-type: none">• Create specialized datasets.• Create live and DirectQuery connections.• Use Power BI service lineage view.• Use XMLA endpoint to connect datasets.
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