



Education and Support for SharePoint, Office 365 and Azure
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COURSE OUTLINE

POWER BI CERTIFICATION BOOTCAMP

Course Duration: 3 Days

Course Code: PBI365

Course Outlines

Power BI Certification Bootcamp is an advanced 3-day training class designed to prepare students to pass Microsoft certification exam 70-778: Analyzing and Visualizing Data with Microsoft Power BI. During the course, students will gain the real-world skills required to design, deploy, upgrade and monitor reporting and dashboard solutions using the rapidly-evolving Power BI platform. All the essential Power BI concepts and techniques discussed in lectures are reinforced with hands-on lab exercises in which students will move through the actual steps required to build reporting and dashboard solutions and then to distribute those solutions to a wide audience using app workspaces and the Power Bi app model.

This course includes in-depth coverage of the query tools and data modeling tools in Power BI Desktop. Students will learn how to design complex queries and to write advanced DAX expressions to calculate rankings, rolling averages and year-to-year comparisons. Students will also learn how to design interactive reports using slicers, bookmarks and drillthrough pages. The course discusses essential differences between reports and dashboards and also examines the strengths and weaknesses between the various types of datasets including imported datasets, DirectQuery datasets and LiveConnect datasets.



This course discusses distributing Power BI content and administrating the Power BI environment at the tenant-level. Students will learn when and how to install an on-premises data gateway to provide connectivity to on-premises data sources such as SQL Server. The course demonstrates how to configure tenant-level settings for Power BI and how to monitor report and dashboard usage within an organization using Power BI audit logs. Along the way, students will learn how to configure row-level security (RLS) and how to leverage the R data analytics platform to extend a Power BI Desktop project using R script visuals.

Course Prerequisites

Due to the accelerated nature of this training class, it is recommended that students have 6 months or more experience working with the Power BI Service and Power BI Desktop. All students will require a Windows PC running Windows 10, Windows 8.1 or Windows 7 to complete the lab exercises for this course.

Module List

1. Introducing the Power BI Platform
2. Designing Queries to Extract and Transform Data
3. Designing a Data Model using DAX and Power BI Desktop
4. Designing and Publishing Interactive Reports
5. Designing Dashboards in the Power BI Service
6. Integrating Excel Workbooks into Power BI
7. Publishing Content using Apps and App Workspaces
8. Understanding Data Refresh, Gateways and DirectQuery
9. Configuring Security and Administrating Power BI
10. Getting Started with R in Power BI Desktop

Module 1: Introducing the Power BI Platform

This module introduces the fundamental concepts and terms associated with the Power BI platform and explains the important differences between using the Power BI Service compared to using Power BI Report Server. Students will learn about Power BI architecture and gain a solid understanding of how the Power BI Service integrates with Azure Active



Directory, Office 365, SharePoint Online and Dynamics 365. Students will work through the steps required to create a trial Office 365 tenant which can serve as a multiuser test environment for designing and testing custom Power BI solutions. Students will learn how to get up and running in the Power BI Service by creating datasets, reports and dashboards using the browser. The module also provides students with a quick primer on working with Power BI Desktop and with the Power BI mobile applications. The module concludes by discussing how to keep current with the monthly updates that Microsoft consistently applies to Power BI Desktop and the Power BI Service.

Topics Covered

- Understanding the Power BI Platform
- Comparing the Power BI Service to Power BI Report Server
- Creating a Trial Office 365 Tenant for Development
- Creating Datasets, Reports and Dashboards
- Creating Projects with Power BI Desktop
- Accessing Content using Power BI Mobile

Module 2: Designing Queries to Extract and Transform Data

This module examines the query tools in Power BI Desktop. Students will learn to import data from a variety of sources including Excel workbooks, databases, web pages and SharePoint lists. Students will also learn effective techniques for cleansing data during the import process and for converting text-based columns into numeric types. The module discusses the best practice of designing queries to generate a star schema composed of fact tables and dimension tables. Along the way, students will learn advanced query design techniques such as working directly with M code and creating query parameters, query functions and Power BI template files.

Topics Covered

- Understanding Query Design and the ETL Process
- Cleansing and Reshaping Data
- Designing Queries to Generate a Star Schema
- Designing with Query Parameters and Query Functions
- Creating Reusable Project Template Files



Module 3: Designing a Data Model using DAX and Power BI Desktop

This module explains the technical details of creating table relationships and the best practices for writing maintainable DAX expressions for calculated columns and measures. The module demonstrates how to create dynamic lookup tables using DAX, how to create dimensional hierarchies and how to configure the data category for geographical data columns to facilitate mapping data to countries, states, cities and zip codes. Student will learn how to use What-If parameters. This module includes an in-depth examination of the DAX evaluation context and explains how row context and filter context affect the way you write advanced DAX expressions. Students will learn how to use the CALCULATE function to manipulate the current filter context and how to extend a data model with a calendar table and the Time Intelligence support in DAX to analyze data in a variety of time dimensions.

Topics Covered

- Using DAX to Create Calculated Columns, Measures and Tables
- Configuring Columns with Geographic Data Categories
- Working with What-If Parameters
- Extending a Data Model with Dimensional Hierarchies
- Understanding Row Context versus Filter Context
- Writing DAX Expressions using the CALCULATE Function
- Working with Calendar Tables and DAX Time Intelligence Functions

Module 4: Designing and Publishing Interactive Reports

This module teaches students how to design interactive reports in Power BI Desktop using slicers, visual highlighting and drill actions. The module explains how to use bookmarks and drillthrough pages to design Power BI reports with interactive navigation and filtering capabilities. The module demonstrates importing custom visuals and designing reports using Phone Layout view. The module examines how report themes can be used to provide a consistent style and branding across multiple reports. The module also discusses the PBIX project publishing process and how it differs when publishing to the Power BI Service versus publishing to Power BI Report Server. The module concludes with an examination of using the Publish to Web feature and the Publish to SharePoint feature with a report that has already been published to the Power BI Service.

Topics Covered

- Designing Interactivity using Slicers and Highlighting



- Using Bookmarks for Interactive Navigation and Filtering
- Designing Reports using Custom Visuals
- Styling and Branding Report using Report Themes
- Publishing PBIX Project Files to the Power BI Service
- Publishing Reports to the Web and to SharePoint Online

Module 5: Designing Dashboards in the Power BI Service

The module teaches students the fundamentals of designing dashboards and examines the strengths and limitations of dashboards when compared to Power BI reports. Students will learn how to create and execute natural language queries and how to pin natural language query results to create dashboard tiles. The module demonstrates using Phone Layout view in the Power BI Service to customize the rendering of dashboards when viewed using mobile devices. Student will learn how to configure data alerts on dashboard tiles as well as how to leverage dashboard sharing as a simple mechanism to share dashboards and their underlying reports with other users. The module concludes with an examination of creating real-time dashboards and a discussion of when to use streaming datasets versus push datasets versus hybrid datasets.

Topics Covered

- Understanding How Dashboards Differ from Reports
- Adding Dashboard Content using Natural Language Queries
- Configuring Data Alerts on Dashboard Tiles
- Sharing Dashboards with Other Users
- Designing Real-time Dashboards
- Understanding Streaming Datasets, Push Datasets and Hybrid Datasets

Module 6: Integrating Excel Workbooks with Power BI

This module explains the integration points that exist between Microsoft Excel, Excel Online and the Power BI Service. Students will learn about the differences between the query and data modeling tools in Microsoft Excel versus those of Power BI Desktop. Student will learn how to connect to an Excel workbook from Power BI to display its contents inside a Power BI workspace. The module explains the motivation and the strategy for migrating a data model out of an Excel workbook into a new Power BI Desktop project which is required to enable



server-side data refresh. The module demonstrates using the Power BI publisher add-in in Microsoft Excel to pin workbook elements to a Power BI dashboard. The module demonstrates using the Analyze in Excel feature to establish a connection between an Excel workbook and a dataset that's been created using Power BI Desktop and published to the Power BI Service.

Topics Covered

- Integrating Microsoft Excel and Excel Online with Power BI
- Understanding Excel Online Limitations with Server-side Datasets
- Connecting to Excel Workbooks from a Power BI Workspace
- Migrating a Data Model from an Excel Workbook to Power BI Desktop
- Working with the Power BI Publisher Add-in in Microsoft Excel
- Analyzing Power BI Datasets using Microsoft Excel

Module 7: Publishing Content using Apps and App Workspaces

The module examines the best practice of building a custom solution in an app workspace and then using the app model to distribute the custom solution on a wide-scale basis. This module walks through the steps of publishing an app workspace and making it accessible to other users as an installable app. Students will learn the various ways one can install a Power BI app. The module demonstrates how to upgrade reports and dashboards after an app has been installed using staged updates. The module explains the essential concepts involved with Power BI Premium and dedicated capacities and demonstrates how to configure an app workspace to run within a dedicated capacity. Along the way, this module will provide students with the decoder ring necessary to understand the capacity-based licensing model and strategies for distributing content to users with the Power BI free license.

Topics Covered

- Understanding the Role of App Workspaces
- Publishing App Workspaces and Installing Apps
- Updating Apps and Managing App Lifecycle
- Understanding Power BI Premium and Dedicated Capacities
- Configuring App Workspaces to Run in a Dedicated Capacity
- Distributing Content to Users with the Power BI Free License



Module 8: Understanding Data Refresh, Gateways and DirectQuery Mode

This module examines the strengths and weaknesses of imported datasets vs. DirectQuery datasets vs. LiveConnect datasets. Students will learn how to configure data source credentials and how to refresh imported datasets on demand or in a scheduled fashion in the Power BI Service. The module discusses managing connectivity to on-premises data sources such as SQL Server and explains which scenarios require you to install and configure an on-premises data gateway. The module explains the advantages and limitations of using DirectQuery mode when creating a Power BI Desktop project. The module concludes with a look at how to create projects which use a live connection to query a tabular database running in SQL Server Analysis Services (SSAS).

Topics Covered

- Understanding Imported Datasets vs. DirectQuery Datasets vs. LiveConnect Datasets
- Configuring Credentials and Refreshing Imported Datasets
- Understanding When and How to Install an On-premises Data Gateway
- Using DirectQuery to Connect to SQL Server
- Using LiveConnect to Connect to SQL Server Analysis Services

Module 9: Configuring Security and Administrating Power BI

The module begins by explaining how Azure Active Directory provides tenant-level support for managing user accounts and groups. Students will learn what is possible in terms of sharing content within an organization as well as across organizational boundaries. The module explains how to administrate the Power BI environment at the tenant level and demonstrates how to monitor usage of reports and dashboards using Power BI audit logs. The module explains how to use row-level security (RLS) by creating security roles in a Power BI Desktop project and writing DAX table filter expressions. The module also examines securing Power BI Desktop projects using a more flexible strategy in which an RLS security role filtered using the USERNAME function in DAX together with a custom table that associates users with the data they are allowed to access.

Topics Covered

- Managing Users and Groups in Azure Active Directory
- Sharing Content with Users from External Organizations
- Administrating Power BI at the Tenant Level
- Monitoring Activity using Power BI Audit Logs



- Securing Datasets using Row-level Security (RLS)
- Designing Projects using Dynamic RLS

Module 10: Getting Started with R in Power BI Desktop

The final module of this course provides students with a fast and furious introduction to R as the world's most popular platform for advanced data analytics and data visualization. Students will learn how to get up and running with R by installing Microsoft R Open and RStudio. The module teaches students R programming fundamentals and explains how to import and load popular R packages. Students use RStudio to write and test R scripts which import data and generate R visualizations. After learning how to write and test R scripts in RStudio, students will then learn how to integrate R code into a Power BI Desktop project. Along the way, students will learn how to import data into a Power BI Desktop project using an R script as well as how to use the R script visual to enhance a Power BI report with visualizations created using powerful R visualization packages such as lattice and ggplot2.

Topics Covered

- Understanding R as a Data Analytics Platform
- Installing the Required Software for R Development
- Writing and Executing R Scripts using RStudio
- Writing R Scripts to Import Data into Power BI Desktop
- Working with the R Script Visual in Power BI Desktop

