PowerBI Course Syllabus

**Stage 1 — Foundations of Power BI (Beginner Level)**

**Goal:** Understand what Power BI is, its components, and how to navigate the interface.

**Topics**

1. **Introduction to Power BI**
   * What is Power BI?
   * Power BI Desktop vs. Power BI Service vs. Power BI Mobile
   * Basic workflow (Get data → Transform → Visualize → Share)
2. **Installing Power BI Desktop**
   * Download & install from Microsoft Store
   * Interface overview: ribbon, fields pane, report view, data view, model view
3. **Getting Data**
   * Importing from Excel/CSV
   * Connecting to databases (SQL Server, Access)
   * Understanding DirectQuery vs Import mode
4. **Basic Visuals**
   * Creating tables, bar charts, line charts, cards
   * Formatting and adding filters
5. **Saving and Publishing**
   * Saving locally
   * Publishing to Power BI Service

**Practice Exercise:**  
Create a simple sales report from an Excel file showing monthly sales and top products.

**Stage 2 — Data Transformation with Power Query (Intermediate Basics)**

**Goal:** Learn how to clean, shape, and prepare data before building reports.

**Topics**

1. **Power Query Editor**
   * Interface & applied steps
   * Renaming, removing, filtering columns
   * Changing data types
2. **Data Cleaning**
   * Removing duplicates
   * Splitting & merging columns
   * Replacing values
3. **Data Shaping**
   * Pivot & unpivot columns
   * Group By and aggregation
4. **Merging & Appending Queries**
   * Joins (inner, outer, left, right)
   * Combining data from multiple sources
5. **Parameters & Query Dependencies**

**Practice Exercise:**  
Clean a messy CSV file of customer transactions, merge it with a product table, and create a clean dataset ready for reporting.

**Stage 3 — Data Modeling (Core Skills)**

**Goal:** Build a robust data model for accurate and scalable reports.

**Topics**

1. **Understanding Relationships**
   * Star schema vs. snowflake schema
   * One-to-many and many-to-many relationships
2. **Managing Relationships**
   * Creating and editing relationships
   * Active vs inactive relationships
3. **Data Modeling Best Practices**
   * Fact vs. Dimension tables
   * Creating a date table
4. **Calculated Columns & Measures (DAX basics)**
   * Difference between columns and measures
   * Basic DAX functions: SUM, COUNT, AVERAGE, DISTINCTCOUNT
5. **Row-level Security (RLS)**

**Practice Exercise:**  
Create a star schema model from sales, customers, and products tables. Add a date table and create a measure for Total Sales.

**Stage 4 — Visualization & Dashboard Design (Intermediate Level)**

**Goal:** Learn to create interactive, insightful, and user-friendly dashboards.

**Topics**

1. **Visual Best Practices**
   * Choosing the right visual for the data
   * Avoiding clutter
2. **Advanced Visuals**
   * Map visuals
   * KPI indicators
   * Matrix tables
   * Waterfall charts
3. **Slicers & Filters**
   * Page-level, report-level, and visual-level filters
   * Sync slicers across pages
4. **Bookmarks & Buttons**
   * Page navigation
   * Drill-through pages
5. **Themes & Branding**
   * Importing custom themes
   * Formatting tips

**Practice Exercise:**  
Create a sales dashboard with slicers for region & date, drill-through for product details, and KPIs for revenue.

**Stage 5 — Advanced DAX (Advanced Level)**

**Goal:** Master calculated measures for complex business logic.

**Topics**

1. **Time Intelligence**
   * YTD, QTD, MTD
   * SamePeriodLastYear, ParallelPeriod
2. **CALCULATE and FILTER**
   * Changing filter context
   * Conditional calculations
3. **Advanced Aggregations**
   * RANKX, TOPN
   * SWITCH for conditional KPIs
4. **Scenario Analysis**
   * What-if parameters
   * Dynamic measures

**Practice Exercise:**  
Create measures for YOY growth, top 3 products by sales, and dynamic KPIs based on user selection.

**Stage 6 — Power BI Service & Collaboration**

**Goal:** Learn sharing, collaboration, and enterprise features.

**Topics**

1. **Publishing & Workspaces**
   * Creating workspaces
   * Assigning roles
2. **Dashboards in Power BI Service**
   * Pinning visuals
   * Alerts and subscriptions
3. **Sharing & Permissions**
   * Sharing with individuals/groups
   * App creation
4. **Scheduled Refresh & Gateways**
   * Configuring refresh schedules
   * Installing and managing on-premises data gateway

**Practice Exercise:**  
Publish your dashboard, share it with a colleague, and set up a daily refresh.

**Stage 7 — Advanced Topics & Optimization**

**Goal:** Learn techniques for large datasets and performance optimization.

**Topics**

1. **Performance Optimization**
   * Query folding
   * Reducing model size
   * Aggregations
2. **Composite Models**
   * Mixed storage modes
3. **AI Features**
   * Q&A visual
   * Smart narratives
4. **Integration with Excel, Teams, and other Microsoft tools**
5. **Custom Visuals**
   * Importing visuals from AppSource
   * Developing custom visuals (optional advanced)

**Final Project (Capstone)**

**Task:**  
Using at least 3 different data sources (e.g., Excel, SQL, web API), create a fully interactive executive dashboard with:

* Cleaned and transformed data
* Well-designed data model
* Advanced DAX calculations
* User-friendly visuals
* Drill-through and bookmarks
* Published to Power BI Service with scheduled refresh

**Weeks 1–2 — Power BI Foundations**

**Goal:** Get comfortable with the interface, importing data, and basic visuals.

**Week 1 — Getting Started**

* Topics:
  + What is Power BI? (Desktop, Service, Mobile)
  + Installing Power BI Desktop
  + Interface overview (Report/Data/Model view)
  + Importing data from Excel/CSV
  + Import vs DirectQuery
* Practice:
  + Import a sample sales Excel file.
  + Create a simple table visual and bar chart.
* Mini-Goal:
  + Build a one-page report showing monthly sales totals.

**Week 2 — Basic Visuals & Publishing**

* Topics:
  + Formatting visuals
  + Adding slicers and filters
  + Basic text boxes and titles
  + Saving & publishing to Power BI Service
* Practice:
  + Add slicers for region and product.
  + Publish the report to Power BI Service.
* Mini-Goal:
  + Share the report with a teammate or yourself via Service.

**Weeks 3–4 — Data Cleaning & Transformation**

**Goal:** Learn Power Query to prepare clean, structured data.

**Week 3 — Power Query Basics**

* Topics:
  + Power Query interface
  + Removing duplicates, renaming columns
  + Splitting & merging columns
  + Changing data types
* Practice:
  + Clean a messy CSV file of customers.
* Mini-Goal:
  + Have a cleaned, ready-to-use dataset.

**Week 4 — Combining Data**

* Topics:
  + Merge queries (joins)
  + Append queries
  + Pivot/unpivot
  + Group By
* Practice:
  + Merge sales data with product info.
* Mini-Goal:
  + Create one master table from multiple files.

**Weeks 5–6 — Data Modeling & Basic DAX**

**Goal:** Build a solid data model with calculated fields.

**Week 5 — Relationships & Data Model**

* Topics:
  + Star schema vs snowflake
  + Creating relationships
  + Date table creation
* Practice:
  + Build a model with Sales, Products, Customers tables.
* Mini-Goal:
  + Correctly relate all tables in a star schema.

**Week 6 — Intro to DAX**

* Topics:
  + Calculated columns vs measures
  + Basic DAX: SUM, COUNT, DISTINCTCOUNT, AVERAGE
* Practice:
  + Create Total Sales, Total Quantity measures.
* Mini-Goal:
  + Have at least 3 working measures in your report.

**Weeks 7–8 — Visualization Design**

**Goal:** Create interactive, professional dashboards.

**Week 7 — Visual Best Practices**

* Topics:
  + Choosing visuals
  + KPI cards
  + Drill-through basics
* Practice:
  + Add KPIs for revenue and profit.
* Mini-Goal:
  + Dashboard with 4–5 visuals, slicers, and drill-through.

**Week 8 — Interactivity & Branding**

* Topics:
  + Bookmarks and buttons
  + Themes & color palettes
  + Syncing slicers
* Practice:
  + Add navigation buttons to switch between pages.
* Mini-Goal:
  + Multi-page dashboard with consistent branding.

**Weeks 9–10 — Advanced DAX & Analysis**

**Goal:** Perform deeper analysis with advanced measures.

**Week 9 — Time Intelligence**

* Topics:
  + YTD, MTD, QTD
  + SamePeriodLastYear, DATEADD
* Practice:
  + Create YOY growth measure.
* Mini-Goal:
  + Add trend analysis over multiple years.

**Week 10 — Complex DAX**

* Topics:
  + CALCULATE, FILTER
  + RANKX, TOPN
* Practice:
  + Create Top 3 Products by Sales measure.
* Mini-Goal:
  + Add dynamic KPIs that change based on slicer selection.

**Weeks 11–12 — Publishing, Collaboration, & Capstone**

**Goal:** Learn sharing features and complete a real project.

**Week 11 — Power BI Service & Refresh**

* Topics:
  + Workspaces & roles
  + Scheduled refresh
  + Data gateway setup
* Practice:
  + Publish your report and schedule a refresh.
* Mini-Goal:
  + Share your dashboard with a user group.

**Week 12 — Capstone Project**

* Project:
  + Use at least 3 data sources (Excel, SQL, Web API)
  + Clean & transform in Power Query
  + Create star schema model
  + Add advanced DAX measures
  + Build branded dashboard with drill-through & bookmarks
  + Publish with scheduled refresh
* Final Mini-Goal:
  + Present the dashboard as if to a stakeholder.

**Dataset links:**

<https://learn.microsoft.com/en-us/power-bi/create-reports/sample-datasets>

<https://www.kaggle.com/datasets/>

<https://www.kaggle.com/datasets/rhuebner/human-resources-data-set>

<https://github.com/microsoft/sql-server-samples/tree/master/samples/databases>