Syllabus for Power BI

**1. Introduction to Power BI**

* **Overview of Power BI**
  + What is Power BI?
  + Key components (Power BI Desktop, Service, Mobile, Report Server, Embedded)
  + Benefits and use cases
* **Power BI Ecosystem**
  + Power BI and other Microsoft tools (Excel, Azure, SQL Server)
  + Power BI Community and resources

**2. Getting Started with Power BI Desktop**

* **Installing Power BI Desktop**
  + System requirements
  + Downloading and installing
  + Interface overview
* **Basic Operations**
  + Creating a new report
  + Saving and opening reports
  + Navigating the interface

**3. Connecting to Data Sources**

* **Types of Data Sources**
  + Databases (SQL Server, Oracle, etc.)
  + Files (Excel, CSV, etc.)
  + Cloud Services (Azure, Google Analytics, Salesforce)
  + Online Services (SharePoint, Dynamics 365)
* **Connecting to Common Data Sources**
  + SQL Server
  + Excel
  + Web data sources
  + Import vs. DirectQuery

**4. Data Transformation with Power Query**

* **Introduction to Power Query**
  + Overview and interface
  + Importance of data transformation
* **Basic Transformations**
  + Removing duplicates
  + Filtering rows
  + Changing data types
* **Advanced Transformations**
  + Merging queries
  + Appending queries
  + Pivoting and unpivoting columns
  + Creating custom columns

**5. Data Modeling**

* **Building a Data Model**
  + Importance of data modeling
  + Tables and relationships
* **Creating Relationships**
  + Types of relationships (one-to-many, many-to-one, many-to-many)
  + Cross-filter direction
* **Calculated Columns and Measures**
  + Difference between calculated columns and measures
  + Creating calculated columns
  + Creating measures using DAX

**6. Introduction to DAX (Data Analysis Expressions)**

* **Basic Concepts of DAX**
  + Syntax and functions
  + Calculated columns vs. measures
* **Common DAX Functions**
  + Aggregation functions (SUM, AVERAGE, COUNT)
  + Logical functions (IF, AND, OR)
  + Text functions (CONCATENATE, LEFT, RIGHT)
* **Time Intelligence Functions**
  + Year-to-date (TOTALYTD)
  + Month-to-date (TOTALMTD)
  + Same period last year (SAMEPERIODLASTYEAR)

**7. Creating Visualizations**

* **Types of Visualizations**
  + Bar charts, line charts, pie charts
  + Tables and matrices
  + Maps and geographic data
* **Building Visualizations**
  + Adding and configuring visuals
  + Formatting options
  + Using slicers and filters
* **Custom Visuals**
  + Importing custom visuals
  + Using marketplace visuals

**8. Interactivity and Drillthrough**

* **Adding Interactivity**
  + Slicers and filters
  + Drillthrough functionality
  + Bookmarks and selections
* **Creating Drillthrough Pages**
  + Setting up drillthrough filters
  + Designing detailed drillthrough pages

**9. Advanced DAX**

* **Advanced Calculations**
  + Variables and nested functions
  + Context and filter manipulation
* **Performance Optimization**
  + Efficient DAX practices
  + Reducing calculation times
* **Advanced Time Intelligence**
  + Year-over-year growth
  + Moving averages

**10. Publishing and Sharing Reports**

* **Publishing to Power BI Service**
  + Steps to publish
  + Setting up workspaces
* **Sharing and Collaboration**
  + Sharing reports and dashboards
  + Collaborative features in Power BI Service
* **Embedding Reports**
  + Embedding in SharePoint
  + Power BI Embedded for apps

**11. Power BI Service Features**

* **Creating Dashboards**
  + Pinning visuals to dashboards
  + Dashboard tiles and customization
* **Dataflows**
  + Overview of dataflows
  + Creating and managing dataflows
* **Data Gateways**
  + Purpose and types of data gateways
  + Setting up and configuring gateways

**12. Security in Power BI**

* **Row-Level Security (RLS)**
  + Defining roles and rules
  + Implementing RLS in Power BI Desktop
  + Managing RLS in Power BI Service
* **Data Protection**
  + Sensitivity labels
  + Data governance policies with Microsoft Information Protection (MIP)

**13. Performance Optimization**

* **Optimizing Reports**
  + Best practices for report performance
  + Using performance analyzer
* **Data Model Optimization**
  + Star schema design
  + Reducing data model size

**14. Power BI Mobile and Power BI Report Server**

* **Power BI Mobile**
  + Overview and setup
  + Viewing and interacting with reports
* **Power BI Report Server**
  + Overview and installation
  + Publishing and managing reports on-premises

Optional Topics (for Advanced Learning)

* **Integrating Power BI with Azure**
  + Using Azure Data Lake
  + Azure Machine Learning integration
* **Custom Visual Development**
  + Building custom visuals with R and Python
  + Using the Power BI SDK
* **Power BI API**
  + Automating Power BI tasks
  + Embedding analytics with Power BI API