Data Analysis using Power BI

Duration: 40 Hours (5 Days)

Module 1: Introduction to Power BI and Business Intelligence

• What is Business Intelligence (BI)?
• Power BI ecosystem: Desktop, Service, and Mobile
• Role of Power BI in Data Analytics
• Power BI workflow: Connect → Transform → Model → Visualize → Share
• Real-world applications of Power BI in different industries

Module 2: Power BI Desktop Interface & Data Connections

• Power BI Desktop environment overview
• Connecting to data sources (Excel, CSV, Web, SQL, Folder)
• Understanding Power BI file structure (.pbix)
• Data import vs DirectQuery vs Live Connection
• Managing queries and data source settings

Module 3: Power Query Basics

• What is Power Query (ETL Process)?
• Power Query Editor interface
• Understanding applied steps
• Renaming, removing, and filtering columns/rows
• Working with data types and errors

Module 4: Data Cleaning Techniques

• Removing duplicates, blanks, and errors
• Replacing and filling missing values
• Trimming and formatting text data
• Splitting and merging columns
• Detecting and managing data quality issues

Module 5: Data Transformation Techniques

• Group By and Aggregate data
• Pivoting and Unpivoting columns
• Custom Columns and Conditional Columns
• Working with date/time and text functions
• Formatting columns for better model performance

Module 6: Combining Multiple Queries

• Append Queries vs Merge Queries
• Importing data from multiple files (Folder method)
• Cross-table transformations
• Managing relationships between combined data sources

Module 7: Advanced Power Query Operations

• Using Parameters in Power Query
• Conditional logic and custom M formulas
• Error handling in Power Query

• Performance tips for query optimization

Module 8: Data Modeling Fundamentals

• Importance of data modeling in Power BI
• Fact and Dimension tables (Star & Snowflake Schema)
• Identifying keys and relationships
• Avoiding common modeling mistakes

Module 9: Building and Managing Relationships

• Relationship types: One-to-One, One-to-Many, Many-to-Many
• Cardinality and cross-filter direction
• Active vs Inactive relationships
• Role of relationships in DAX calculations

Module 10: Creating a Calendar (Date) Table

• Importance of Calendar tables in time intelligence
• Creating Date Table using DAX and Power Query
• Adding Year, Quarter, Month, Week, and Day columns
• Marking as Date Table

Module 11: Introduction to DAX

• What is DAX?
• Difference between calculated columns, measures, and tables
• Syntax and structure of DAX formulas
• Context in DAX – Row, Filter, and Evaluation Context

Module 12: Logical and Text Functions

• IF, SWITCH, AND, OR, IFERROR
• CONCATENATE, LEFT, RIGHT, MID, SEARCH, SUBSTITUTE
• Data categorization and analysis

Module 13: Aggregation and Filter Functions

• SUM, AVERAGE, MIN, MAX, COUNTROWS, DISTINCTCOUNT
• CALCULATE and FILTER fundamentals
• Applying dynamic filtering in measures

Module 14: Relationship and Iterator Functions

• SUMX, AVERAGEX, COUNTX
• RELATED and RELATEDTABLE
• Row Context vs Filter Context

Module 15: Time Intelligence Functions

• YTD, QTD, MTD
• SAMEPERIODLASTYEAR, DATEADD, DATESYTD
• Custom calendar and fiscal year handling

Module 16: Mastering ALL and ALLEXCEPT Functions

• ALL, ALLSELECTED, ALLEXCEPT
• Dynamic percentage and rank calculations
• % of Total Sales example

Module 17: Relationship Control Functions

• USERELATIONSHIP
• CROSSFILTER
• Multiple date fields
• Time intelligence examples

Module 18: Context & Filter Control with KEEPFILTERS

• KEEPFILTERS with CALCULATE, FILTER, VALUES
• Dedicated Measure Table
• YoY and MoM reports

Module 19: Visualization Fundamentals

• Choosing visuals
• Bar, Column, Line, Pie, Table
• Slicers, Cards, KPIs
• Formatting

Module 20: Advanced Visualizations

• Combo, Scatter, Maps, Waterfall
• Matrix conditional formatting
• Decomposition Tree, Key Influencers, Smart Narrative
• AppSource visuals

Module 21: Conditional Formatting

• Color formatting
• Data bars, icons, gradients
• Measure-driven formatting

Module 22: Field Parameters

• Dynamic measures and dimensions
• Dynamic dashboards

Module 23: Drill-down, Drill-through, and Tooltips

• Hierarchies
• Drill-through pages
• Custom tooltips

Module 24: Dashboard Layout and Design

• Layout best practices
• Bookmarks and navigation
• Interactive dashboards

Module 25: Report Optimization and Performance

• Data model optimization
• Reduce file size
• Faster visuals

Module 26: Power BI Service Overview

• Service features and licensing
• Workspaces, apps, datasets
• Publishing reports

Module 27: Data Refresh and Gateway Configuration

• Scheduled refresh
• On-premises gateway
• Troubleshooting

Module 28: Collaboration, Roles, and Security

• Row-Level Security (RLS)
• Sharing and permissions
• App publishing

Module 29: AI & Q&A; Features in Power BI

• AI visuals
• Q&A; visual
• Smart Narrative

Module 30: Power BI Mobile & Integration

• Mobile app
• Excel, Teams, SharePoint integration
• Embedding

Module 31: Performance & Governance

• Governance and compliance
• Dataset certification and lineage
• Workspace/version control

Module 32: Final Case Study – End-to-End Dashboard Project

• End-to-end project
• Data cleaning, transformation, modeling, visualization
• Business insight storytelling
• Final review and Q&A;