



# **Data Analysis Diploma**

# **Diploma Courses:**

- 1. Introduction (4 hours)
- 2. Statistics (4 hours)
- 3. Excel (24 hours)
- 4. Power BI (24 hours)
- 5.SQL (20 hours)
- 6. Python Basics (16 hours)
- 7. Coaching Session (4 hours)
- 8. Projects

# Prerequisites:

o None

**NeuroTech** 



# Course 1 "Statistics": (8 hour)

### Module 1: Introduction to Data Analysis

- What is Data Analysis?
- Data Types
- Databases
- Applications of Data Analysis
- Data Analysis Tools

#### **Module 2: Descriptive Statistics**

- Measures of Central Tendency (Mean, Median, Mode)
- Measures of Dispersion (Variance, Standard Deviation, Range)
- Histograms and Box Plots
- **Probability Density Functions**

# Course 2 "Excel": (24 hour)

#### **Module 1: Introduction to Excel**

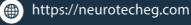
- Understanding the Excel Interface
- Workbook vs. Worksheets
- Navigating Cells, Rows, and Columns
- Basic Data Entry and Editing

#### **Module 2: Formatting and Data Management**

- Cell Formatting (Numbers, Text, Date, Currency)
- **Conditional Formatting**
- Merging & Wrapping Cells
- Sorting and Filtering Data

#### **Module 3: Basic Formulas and Functions**

- Introduction to Formulas in Excel
- Basic Arithmetic Operations (+, -, \*, /)
- **Common Functions:** 
  - SUM, AVERAGE, MIN, MAX
  - COUNT, COUNTA, COUNTIF
- Relative vs. Absolute Cell References (\$A\$1)







#### **Module 4: Working with Tables and Charts**

- Creating and Formatting Tables
- Basic Charts (Bar, Column, Pie)
- Customizing Charts (Titles, Labels, Legends)

#### **Module 5: Data Validation and Protection**

- Creating Drop-down Lists
- **Data Entry Restrictions**
- Protecting Sheets and Workbooks

#### **Module 6: Printing and Sharing Excel Files**

- Page Layout and Print Settings
- Saving as PDF
- Sharing and Collaboration in Excel

#### **Module 7: Advanced Functions and Formulas**

- **Logical Functions:** 
  - IF, IFS, AND, OR
- Lookup Functions:
  - VLOOKUP, HLOOKUP, XLOOKUP, INDEX, MATCH
- Text Functions:
  - LEFT, RIGHT, MID, CONCATENATE, TEXTJOIN, TRIM, LEN
- Date & Time Functions:
  - TODAY, NOW, DATEDIF, EOMONTH

#### **Module 8: Advanced Data Management**

- **Data Cleaning Techniques**
- **Removing Duplicates**
- Advanced Sorting & Filtering
- Splitting & Merging Data with TEXT-TO-COLUMNS

#### **Module 9: Pivot Tables and Pivot Charts**

- **Creating Pivot Tables**
- **Customizing Pivot Tables**
- Calculated Fields in Pivot Tables
- **Creating Pivot Charts**

#### Module 10: Data Analysis and Visualization

- Advanced Charts (Waterfall, Heatmaps, Combo Charts)
- Trend Analysis and Forecasting
- Goal Seek and What-If Analysis







#### **Module 11: Macros and Automation**

- Introduction to Macros
- Recording and Running Macros
- Introduction to VBA for Beginners



# Course 3 "Power BI": (24 hour)

#### **Module 1: Introduction to Power BI**

- What is Power BI? Overview and Components
- Power BI Desktop vs. Power BI Service vs. Power BI Mobile
- Understanding the Power BI Workflow (Data  $\rightarrow$  Model  $\rightarrow$  Visualize  $\rightarrow$  Share)
- Installing and Setting Up Power BI

#### **Module 2: Connecting and Transforming Data (Power Query)**

- Importing Data from Excel, CSV, SQL, and Online Sources
- Data Cleaning & Transformation using Power Query
- Removing Duplicates, Handling Missing Data
- Splitting & Merging Columns

#### **Module 3: Data Modeling Basics**

- Understanding Relationships Between Tables
- Creating a Data Model in Power BI
- Primary Key vs. Foreign Key
- Introduction to Calculated Columns and Measures

#### Module 4: Data Visualization in Power BI

- Creating Basic Reports & Dashboards
- Common Visuals:
  - Bar Chart, Pie Chart, Line Chart, Table, Matrix
- Formatting Visuals (Titles, Colors, Legends)
- Using Filters, Slicers, and Drill-through

#### **Module 5: Introduction to DAX (Data Analysis Expressions)**

- Understanding DAX and its Uses
- **Basic DAX Functions:** 
  - SUM, AVERAGE, COUNT, DISTINCTCOUNT
- Creating Basic Measures and Calculated Columns

#### **Module 6: Sharing and Publishing Reports**

- Publishing Reports to Power BI Service
- Sharing Dashboards and Reports with Others
- Exporting Reports to PDF, PowerPoint, and Excel

#### Module 7: Advanced Data Modeling & Relationships

- Understanding Star Schema vs. Snowflake Schema
- Managing One-to-Many and Many-to-Many Relationships
- Optimizing Data Models for Performance

#### **Module 8: Advanced DAX Functions**

- Logical & Conditional Functions:
  - IF, SWITCH, HASONEVALUE
- Time Intelligence Functions:
  - YEAR, QUARTER, SAMEPERIODLASTYEAR, DATEADD
- Ranking & Aggregation:
  - RANKX, SUMX, AVERAGEX
- Advanced Measures and KPIs







#### **Module 9: Power Query Advanced Techniques**

- Merging & Appending Queries
- Creating Custom Columns in Power Query
- Parameterizing Queries for Dynamic Reports

#### Module 10: Advanced Data Visualization Techniques

- Custom Visuals & Advanced Charting (Gauge, Tree Map, Waterfall)
- Dynamic Visual Interactions (Bookmarks, Drillthrough, Tooltips)
- Conditional Formatting and Dynamic Titles
- Using AI-powered Visuals (Decomposition Tree, Key Influencers)

### **Module 11: Performance Optimization**

- Reducing File Size & Improving Query Performance
- Best Practices for Data Refresh and Query Folding
- Using Aggregations and Optimizing DAX Measures

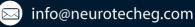
#### **Module 12: Power BI Service and Automation**

- Setting Up Data Gateways for Automatic Refresh
- Creating & Managing Dataflows in Power BI Service
- Power BI Workspaces and Row-Level Security (RLS)
- Automating Reports with Power Automate

#### Module 13: Real-World Use Cases & Capstone Project

- Business Intelligence Use Cases (Finance, HR, Sales, Marketing)
- Hands-on Capstone Project:
  - Build an End-to-End Power BI Dashboard
  - Connect, Clean, Model, Visualize, and Share







# Course 4 "SQL": (20 hour)

#### Module 1:

- Introduction to SQL and Databases
- Data Retrieval and Filtering
- **Aggregation Functions**

#### Module 2:

- **SQL** Joins
- Subqueries and Nested Queries
- Data Manipulation
- **Data Definition and Constraints**

#### Module 3

- Views and Indexes
- Transactions and Error Handling
- SQL Optimizatio n and Best Practice





# Course 5 "Python": (16 hour)

#### **Module 1: Introduction to Python**

- Overview of Python and its uses
- Installing Python and running your first program
- Basic syntax and data types in Python
- Variables and assignments
- Basic arithmetic operators and expressions
- Introduction to strings and string manipulation

#### **Module 2: Control Structures**

- Conditional statements and expressions
- Comparison and logical operators
- Loops and iteration
- Functions and function calls
- Scope and global/local variables
- Recursion and iterative algorithms

#### **Module 3: Data Structures**

- Lists and tuples.
- Dictionaries and sets
- Arrays and matrices
- Strings and regular expressions

#### **Module 4: File Input/Output**

- Reading and writing files
- CSV, JSON, and other data formats
- **Exception handling**





# **Projects:**

#### 1. Sales Performance Dashboard

- Objective: Analyze sales data, track revenue trends, and identify top-performing products and regions.
- Tools: Excel, Power BI, SQL

### 2. General Ledger Anomaly Detection

- Objective: Detect abnormal transactions in General Ledger (GL) data.
- Tools: Excel, SQL, Power BI

## 3. Customer Churn Analysis

- Objective: Identify customers at risk of leaving based on transaction history and engagement.
- Tools: Excel, Power BI, SQL

# 4. Employee Attendance & Productivity Dashboard

- Objective: Track employee attendance, leaves, and productivity trends.
- Tools: Excel, Power BI, SQL

## 5. Salary & Compensation Analysis

- Objective: Analyze salary distribution, pay gaps, and employee compensation trends.
- Tools: Excel, Power BI, SOL

## 6. Customer Segmentation & Lifetime Value Analysis

- Objective: Segment customers based on purchasing behavior and estimate lifetime value (LTV).
- Tools: SQL, Excel, Power BI

## 7. Social Media Engagement Analysis

- Objective: Track social media engagement metrics and identify trends.
- Tools: Excel, Power BI

### 8. Inventory Optimization Dashboard

- Objective: Track stock levels, reorder points, and inventory trends.
- Tools: SQL, Excel, Power BI

# 9. Supplier Performance Analysis

- Objective: Evaluate supplier delivery times, order accuracy, and costs.
- Tools: Excel, Power BI

### 10. Property Price Prediction

- Objective: Analyze real estate price trends and predict future prices.
- Tools: SOL, Excel, Power BI



