Data Analysis Syllabus

1: Excel

1: Introduction to Excel for Data Analysis

- Overview of Excel interface
- Basics of navigating and working with sheets
- Introduction to cells, rows, columns, and ranges
- Understanding basic functions (SUM, AVERAGE, COUNT)
- Working with mathematical and statistical functions
- Introduction to text functions for data manipulation

2: Advanced Formulas and Functions

- Working with logical functions (IF, AND, OR)
- Exploring lookup functions (VLOOKUP, HLOOKUP, INDEX, MATCH)
- Introduction to array formulas
- Identifying and handling missing data
- Removing duplicates and dealing with errors
- Text-to-columns and data-splitting techniques
- Formatting data for analysis
- Creating basic charts and graphs
- Tips for effective data presentation
- Introduction to PivotTables for dynamic data analysis
- Creating PivotCharts for visual insights
- Customizing and formatting PivotTables and PivotCharts
- Time-saving shortcuts and productivity hacks
- Excel with AI

2: SQL

1.Introduction to SQL and Database Fundamentals

- Overview of SQL and its applications
- Introduction to Relational Databases
- Basic SQL syntax and structure
- Creating and modifying tables with CREATE and ALTER
- Understanding data types and constraints

2.Retrieving Data with SELECT Statements

- Basics of SELECT statements
- Filtering data with WHERE clause
- Sorting results with ORDER BY

3: Advanced SQLTechniques

1.Aggregation and Grouping

- Understanding aggregate functions (SUM, AVG, COUNT)
- Grouping data with GROUP BY
- Working with complex WHERE conditions
- Using operators (AND, OR, NOT, etc)

2.Window Functions and Analytic Queries

- Introduction to window functions

- Performing analytic queries with OVER clause

4: Advance SQL

1.Joins and Subqueries

- Performing INNER and OUTER joins
- Using subqueries for complex queries

2.Case Statements and CTE Queries

- Understanding and using CASE statements in SQL
- Applying CASE statements in data analysis scenarios
- Introduction to Common Table Expressions
- Using CTEs for recursive queries and data manipulation

5: More on SQL

1.Time-saving shortcuts and productivity hack

- Optimization of queries
- Optimization of queries using AI
- Interview based SQL queries

2: Working on live project

- Working on industry orient data
- Problem-solving using SQL on industrial data

6: Introduction to Python for Data Analysis

1.Introduction to Python and Jupyter Notebooks

- Overview of Python programming language
- Introduction to Jupyter Notebooks for data analysis
- Variables, data types, and basic operations
- Lists, tuples, and dictionaries
- Inbuilt functions

2.Data Manipulation with Python

- Conditional statements and loops
- User defined functions
- Functions such as map, filter, lambda

7: Exploring Data with Pandas & Matplotlib

1: Data Manipulation with Pandas

- Overview of Pandas Library
- Reading and writing data along with basic operations with Pandas

2: Data Cleaning and Preprocessing with Pandas

- Handling missing data
- Removing duplicates and dealing with outliers
- Cleaning and adjustments in data

8: EDA & Data Visulization

1: Exploratory Data Analysis (EDA) with Pandas

- Descriptive statistics and data summarization
- Grouping and aggregating data
- SQL like operation in data

2: Data Visualization with Matplotlib

- Creating basic plots (line plots, scatter plots, histograms)
- Customizing and styling visualizations

9: Real-time Python

1: Advanced Data Analysis with NumPy

- Introduction to NumPy for numerical operations
- Working with arrays and matrices

2: Advanced Data Visualization with Seaborn

- Creating informative and aesthetically pleasing visualizations
- Pair plots, heatmaps, and advanced plotting technique

10: Statistical Analysis

1: Data Modeling and Relationships in Power BI

- Creating a data model in Power BI
- Understanding relationships between tables
- Implementing calculated columns and measures
- Using DAX (Data Analysis Expressions) for advanced calculations

2: Visualizations and Interactivity

- Creating common visualizations (bar charts, line charts, etc.)
- Customizing visualizations for better insights
- Adding interactivity to reports and dashboards
- Implementing drill-through actions for detailed analysis
- The Art of Storytelling with Data
- Principles of Effective Data Storytelling
- Importance of narrative in data presentations
- Building a cohesive narrative in Power BI
- Using bookmarks and storytelling features

12: Power BI for Real-Time Analytics and Advanced Features

1: Real-Time Dashboards

- Setting up real-time data streaming in Power BI
- Creating dashboards for live data monitoring

2: Advanced Features and Custom Visuals

- Exploring custom visuals and visuals from the marketplace
- Leveraging advanced features like forecasting and clustering
- Case Studies and Discussion
- Reviewing case studies of effective Power BI usage
- Q&A and discussions on best practices in storytelling with data

13: Tableau

1: Introduction to Tableau for Data Analysis

- Tableau – Navigation
- Start Page in Tableau
- Tableau – Design Flow
- Tableau – File System
- Tableau – Data Types
- How to change Data type in Tableau?
- Tableau – Connect to a data source

- Import Excel file in Tableau
- Data Cleaning in Tableau
- Tableau – Join databases
- Joining data files with inconsistent labels
- Data Blending
- Replacing Data source
- Tableau – Split the text to columns
- Tableau – Displaying data in Worksheet
- Tableau – Adding, Renaming and duplicating worksheets
- Create Visualization
- Change the order in visualization
- Change the summary
- Line graph in Tableau
- Dual Lines Chart in Tableau
- Bar Chart in Tableau
- Side-by-Side Bars in Tableau
- Stacked Bars in Tableau
- Histogram in Tableau
- Cumulative Histogram in Tableau
- Scatter plot in Tableau
- Bubble Chart in Tableau
- Pie chart in tableau
- Crosstab in tableau
- Total in a crosstab by column in Tableau
- Box Plot in Tableau
- Bullet Graph in Tableau
- Area Chart in Tableau
- Heat Map in Tableau
- Basic Map in Tableau
- Geographical plot in Tableau
- Lollipop Chart in Tableau
- Circle views in Tableau
- Dual Combination Chart in Tableau
- Treemap in Tableau
- Funnel Chart in Tableau
- Traditional Funnel Chart in Tableau
- Waterfall Chart in Tableau
- Gantt Chart in Tableau

2: Advanced Features and Custom Visuals

- Tableau – Operators
- IF Function in Tableau
- Aggregate Functions in Tableau

- Create Calculated Field in Tableau
- Logical Functions in Tableau
- Case Function in Tableau
- Highlight Tables in Tableau
- Quick Table Calculation in Tableau
- LOD Calculation
- Filtering in Visualization in Tableau
- Quick Filter in Tableau
- Context Filter in Tableau
- Conditional Filter in Tableau
- Slicing Filter in Tableau
- Grouping in Visualization in Tableau
- Hierarchy in Tableau
- Set in Tableau
- Combined Set in Tableau
- Parameters in Tableau
- Tableau Bins
- Manual Sorting of Visualization in Tableau
- Sorting by Data Source order in Visualization in Tableau
- Sorting by field in Visualization in Tableau
- Create a Dashboard in Tableau
- Text Object on Dashboard in Tableau
- Image Object on Dashboard in Tableau
- Tableau – Objects on Dashboard
- Tableau – Filters in Dashboard
- Tableau – Device Preview
- Format Dashboard Layout in Tableau
- Forecast in Tableau
- Reference line in Tableau
- Reference Band in Tableau
- Reference Distribution Band in Tableau
- Trend Lines in Tableau
- Tableau – Building up a storyline
- Word Cloud in Tableau