Data Analytics Course Content

Module 1: Introduction to Data Analysis

Objective: Understand the fundamentals of data analysis, its applications, and the tools used in the industry.

- **Overview of Tools**
    - Introduction to Excel, Power BI, SQL, and Python
    - Choosing the right tool for the job

Module 2: Excel for Data Analysis

Objective: Master Excel's core features for organizing, analyzing, and visualizing data.

- **Excel Basics**
    - Worksheets, cells, and data types
    - Basic functions: SUM, AVERAGE, COUNT, etc.
- **Data Cleaning in Excel**
    - Removing duplicates
    - Handling missing values
    - Text-to-columns, Find and Replace
- **Data Analysis Tools in Excel**
    - Sorting and Filtering
    - PivotTables and PivotCharts
    - Conditional formatting
- **Advanced Functions in Excel**
    - VLOOKUP, HLOOKUP, INDEX-MATCH
    - IF statements and nested formulas
    - Array formulas
    - Data validation
- **Excel Data Visualization**
    - Creating basic charts (bar, line, pie, etc.)

- Advanced charting techniques
- Dashboard creation

Module 3: Power BI for Data Visualization and Reporting

Objective: Learn how to use Power BI to create interactive reports and dashboards.

- **Introduction to Power BI**
  - What is Power BI and its components (Desktop, Service, Report Server)
  - Power BI Interface Overview
  - Data Import and Transformation using Power Query
- **Data Modeling in Power BI**
  - Connecting and transforming data
  - Building relationships between tables
  - Introduction to DAX (Data Analysis Expressions)
- **Data Visualization in Power BI**
  - Creating basic visualizations (tables, bar charts, line charts)
  - Customizing visualizations
  - Using slicers and filters
  - Designing dashboards
- **Power BI Advanced Features**
  - Power BI Service (publishing and sharing reports)
  - Power BI Apps and Collaboration

Module 4: SQL for Data Analysis

Objective: Learn SQL to query, manipulate, and analyze data stored in relational databases.

- **Introduction to Databases and SQL**
  - What is SQL? Understanding databases and tables
  - SQL query structure (SELECT, FROM, WHERE, ORDER BY)
- **Basic SQL Queries**

    - Filtering and sorting data
    - Using functions (COUNT, AVG, SUM, etc.)
    - Grouping data with GROUP BY
    - Joining tables (INNER JOIN, LEFT JOIN, RIGHT JOIN)
- **Advanced SQL Queries**
    - Subqueries and nested queries
    - Window functions (ROW_NUMBER, RANK, etc.)
    - Using CASE statements for conditional logic
- **SQL for Data Analysis**
    - Aggregating data
    - Writing complex queries for data extraction
    - SQL for reporting (using UNION, DISTINCT, and GROUP BY)

Module 5: Python for Data Analysis

Objective: Use Python to perform data manipulation, analysis, and visualization.

- **Introduction to Python for Data Analysis**
    - Python basics (variables, data types, loops, and functions)
    - Introduction to Python libraries: Pandas, NumPy, Matplotlib, Seaborn
- **Data Manipulation with Pandas**
    - Reading and writing data (CSV, Excel, SQL databases)
    - DataFrames and Series
    - Data cleaning (handling missing values, removing duplicates)
    - Merging, joining, and concatenating data
- **Exploratory Data Analysis (EDA) with Python**
    - Descriptive statistics (mean, median, mode, standard deviation)
    - Visualizing data using Matplotlib and Seaborn (histograms, box plots, scatter plots)
    - Correlation analysis and basic hypothesis testing
- **Data Visualization with Python**

- Advanced visualizations (heatmaps, pair plots, etc.)
- Customizing plots (colors, titles, labels, legends)
- Creating interactive plots using Plotly

Module 6: Capstone Project

Objective: Apply the learned skills to solve a real-world data analysis problem.

- **Project Scope and Data Collection**
  - Understanding the problem and dataset
  - Setting objectives for the analysis
- **Data Cleaning and Preparation**
  - Importing, cleaning, and preparing the dataset
  - Data transformation and manipulation
- **Analysis and Visualization**
  - Perform exploratory data analysis
  - Use Excel, Power BI, SQL, or Python (depending on the project) for analysis
  - Create visualizations and insights from the data
- **Reporting and Presentation**
  - Presenting findings in Power BI or Python notebooks
  - Writing a summary of the analysis process, insights, and conclusions