



DATA ANALYTICS

(PYTHON, POWER BI/TABLEAU, EXCEL,
SQL, STATISTICS)
TRAINING COURSE BROCHURE



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Module 1: Fundamentals of Data Analytics & Python for Data Analysis

Introduction to Data Analytics

- **What is Data Analytics?**
 - Definitions, scope, and industry use cases.
 - Types of Data Analytics: Descriptive, Diagnostic, Predictive, and Prescriptive.
 - Differences between Data Analytics, Data Science, and Data Engineering.
- **Data Types and Sources:**
 - Structured vs. Unstructured data.
 - Data sources (e.g., databases, APIs, sensors).
 - Introduction to Big Data.
- **Data Analytics Lifecycle:**
 - Data collection, cleaning, exploration, modeling, interpretation, and communication.
- **The Role of a Data Analyst:**
 - Key responsibilities.
 - Tools and skillsets.

Python Programming for Data Analytics

- **Python Basics:**
 - Data types (integers, strings, lists, dictionaries, etc.).
 - Control structures (loops, conditionals).
 - Functions and modules.
- **Introduction to NumPy:**
 - Arrays and vectorization.
 - Mathematical operations and matrix manipulations.
- **Introduction to Pandas:**
 - Dataframes, Series, and basic data manipulations.
 - Importing and exporting datasets (CSV, Excel, SQL).
 - Filtering, grouping, and summarizing data.
- **Data Cleaning:**
 - Handling missing values.
 - Data type conversions.
 - Removing duplicates.
- **Exploratory Data Analysis (EDA):**
 - Descriptive statistics (mean, median, mode, variance).
 - Data visualization (line plots, histograms, scatter plots) using Matplotlib and Seaborn.

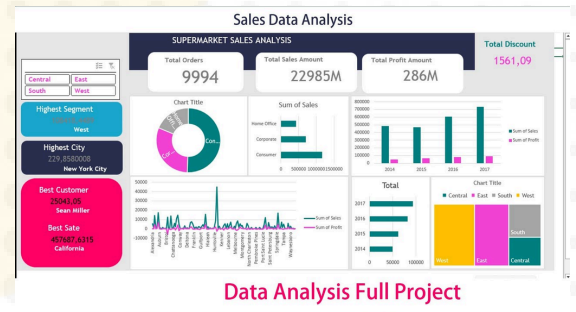
 **Course Project**
Titanic Dataset

Analyze the Titanic dataset to discover insights about survival rates based on different variables (e.g., gender, age, class). Clean the data, handle missing values, and create visualizations.

Module 2: Advanced Excel & SQL for Data Analysis

Advanced Excel for Data Analytics


- **Advanced Functions:**
 - VLOOKUP, HLOOKUP, INDEX, and MATCH.
 - IF, SUMIF, COUNTIF, and conditional formatting.
- **Pivot Tables & Charts:**
 - Summarizing large datasets using Pivot Tables.
 - Creating interactive visualizations with Pivot Charts.
- **Data Cleaning in Excel:**
 - Text-to-columns, removing duplicates.
 - Handling large datasets with filtering and sorting.
- **Excel Automation:**
 - Using Macros for repetitive tasks.
 - Excel shortcuts for efficiency.



SQL for Data Analysis

- **Introduction to SQL:**
 - Database concepts, relational databases.
 - Basic SQL syntax: SELECT, FROM, WHERE, GROUP BY, HAVING.
- **Joins & Subqueries:**
 - INNER, LEFT, RIGHT, and FULL Joins.
 - Writing nested subqueries for complex data retrieval.
- **SQL Functions:**
 - String functions, aggregate functions (COUNT, SUM, AVG).
 - Date/time functions.
- **Advanced SQL:**
 - Common Table Expressions (CTEs).
 - Window Functions (ROW_NUMBER, RANK).
 - SQL optimization and indexing.

Tools: Excel (Pivot Tables, Charts), SQL (MySQL, PostgreSQL).

 **Course Project**
Analyze a company's sales data to identify trends, top-performing products, and customer behavior. Use Excel for reporting and SQL for data extraction.

Module 3: Advanced SQL and Data Analysis Techniques

Advanced SQL for Data Analytics

- **Complex Queries:**
 - Writing efficient joins across multiple tables.
 - Advanced filtering with CASE WHEN statements.
- **Working with Large Datasets:**
 - Partitioning, indexing, and query optimization.
 - Managing performance in large datasets.
- **Data Aggregation and Reporting:**
 - Grouping data for reports.
 - Rolling up data with GROUP BY and CUBE operations.

Data Wrangling Techniques

- **Data Merging:**
 - Combining datasets using SQL joins or Pandas merge().
- **Handling Time Series Data:**
 - Time-based grouping (weekly, monthly).
 - Resampling and interpolation.
- **Data Transformation:**
 - Feature engineering (creating new features).
 - Binning, categorization, and handling skewed data.


Module 4: Data Visualization & Power BI

Introduction to Power BI

- **Getting Started with Power BI:**
 - Importing datasets and data connections.
 - Data cleaning and transformation using Power Query.
- **Creating Reports:**
 - Building visualizations (bar charts, line charts, scatter plots, pie charts).
 - Interactions between visuals.
- **Power BI Dashboards:**
 - Creating dynamic dashboards with slicers and filters.
 - Publishing and sharing dashboards.
- **DAX Basics (Data Analysis Expressions):**
 - Calculated columns and measures.
 - Writing DAX formulas for aggregating and transforming data.

Data Visualization Concepts

- **Principles of Effective Visualization:**
 - Choosing the right chart type for data.
 - Avoiding misleading visualizations.
- **Visualizing Key Metrics:**
 - KPIs, trends, and comparisons.
 - Dashboards vs. Reports.

 **Course Project**
Interactive
Dashboard

Create a dynamic sales dashboard for management to track KPIs and monitor sales performance across different regions and time periods.


Module 5: Introduction to Statistics for Data Analytics

Data Wrangling Techniques

- **Descriptive Statistics:**
 - Measures of central tendency (mean, median, mode).
 - Measures of dispersion (variance, standard deviation, range).
- **Probability Distributions:**
 - Normal, binomial, and Poisson distributions.
 - Z-scores and standardization.
- **Hypothesis Testing:**
 - Null and alternative hypotheses.
 - t-tests, chi-square tests, and ANOVA.

Data Wrangling Techniques

- **Introduction to Regression:**
 - Linear regression and its applications.
 - Multiple linear regression for predicting outcomes.
 - Model evaluation (R-squared, RMSE).
- **Introduction to Machine Learning Algorithms:**
 - Supervised vs. Unsupervised Learning.
 - Logistic regression for classification problems.
- **Introduction to Time Series Analysis:**
 - Time-based trends and seasonality.
 - Moving averages, ARIMA models.

 **Course Project**
Tools: Python,
SQL, Power BI.

Build a predictive model using regression to analyze customer churn data and predict which customers are likely to leave based on their behavioral data.