📘 Chapter 1: Fundamentals of Data Analytics & Excel for Data Handling

1.1 Introduction to Data Analytics

- What is Data Analytics?
- Types of Data Analytics: Descriptive, Diagnostic, Predictive, Prescriptive
- Types of Data (Qualitative, Quantitative)
- Structured vs Unstructured Data
- Data Analytics vs Data Science
- Data Lifecycle and Workflow
- Data Analyst vs Data Scientist vs Data Engineer
- Applications of Data Analytics in various industries

1.2 Excel for Data Analytics

- Excel Interface, Shortcuts & Tips
- Formulas and Functions (SUM, AVERAGE, IF, VLOOKUP, INDEX, MATCH)
- Conditional Formatting
- Sorting & Filtering Data
- Working with Tables and Named Ranges
- Data Validation
- Charts and Graphs (Line, Bar, Pie, Scatter)

1.3 Data Cleaning in Excel

- Removing Duplicates
- Handling Missing Values
- Text Functions (LEFT, RIGHT, MID, LEN, TRIM)
- Date Functions
- Advanced Filters & Pivot Tables

📘 Chapter 2: Statistics & Probability for Data Analytics

2.1 Descriptive Statistics

- Measures of Central Tendency (Mean, Median, Mode)
- Measures of Dispersion (Range, Variance, Standard Deviation)
- Frequency Distributions
- Percentiles and Quartiles
- Box Plot Interpretation

2.2 Probability Theory

- Basic Probability Rules
- Independent & Dependent Events
- Conditional Probability
- Bayes' Theorem

2.3 Inferential Statistics

- Sampling Techniques
- Hypothesis Testing (Z-test, T-test, Chi-square test, p-value)
- Confidence Intervals
- ANOVA

2.4 Correlation & Regression

- Correlation Coefficient
- Simple Linear Regression
- Multiple Linear Regression
- Correlation vs Causation

📘 Chapter 3: Python for Data Analytics

3.1 Python Basics

- Installing Python & Jupyter Notebook
- Variables, Data Types, Operators
- Loops and Conditionals
- Functions and Modules

3.2 Working with Libraries

- **NumPy**: Arrays, Indexing, Slicing, Mathematical Operations
- **Pandas**:
  - Data Frames and Series
  - Reading/Writing CSV & Excel
  - Data Cleaning (missing values, duplicates, type conversions)
  - Group By and Aggregations
  - Merging and Joining

3.3 Data Visualization in Python

- **Matplotlib**: Line, Bar, Histogram, Pie Charts
- **Seaborn**: Heatmaps, Pair plots, Boxplots, Regression Plots

📘 Chapter 4: SQL & Databases

4.1 Introduction to Databases

- Relational Databases Concepts
- Tables, Primary Key, Foreign Key

4.2 SQL Basics

- SELECT, WHERE, ORDER BY
- Filtering with IN, LIKE, BETWEEN
- Aggregate Functions (SUM, AVG, COUNT, MIN, MAX)
- GROUP BY and HAVING
- JOINS (INNER, LEFT, RIGHT, FULL)
- Subqueries

4.3 Advanced SQL

- Views
- Stored Procedures and Functions

- Window Functions (ROW_NUMBER, RANK, NTILE)
- Case Statements
- Handling Nulls

📘 Chapter 5: Data Cleaning, EDA & Data Visualization

5.1 Data Cleaning & Preparation
- Handling Missing Values (drop, fillna, interpolation)
- Dealing with Outliers
- Data Type Conversions
- Feature Scaling (Normalization, Standardization)

5.2 Exploratory Data Analysis (EDA)
- Understanding Data Distribution
- Univariate & Bivariate Analysis
- Feature Engineering Techniques
- Correlation Matrix & Heatmaps
- Simple Data Projects

5.3 Data Visualization Tools
- Advanced Charts in Excel
- Python (Matplotlib, Seaborn)
- Introduction to **Tableau / Power BI**
- Creating Dashboards
- Interactive Visuals

5.4 Data Visualization with Power BI / Tableau
- What is Data Visualization?
- Introduction to Power BI or Tableau
- Connecting to Data Sources
- Creating Reports and Dashboards
- Visualizing Trends and Comparisons
- Filters, Slicers, and Drill-Through
- Publishing and Sharing Dashboard

📘 Chapter 6: Capstone Project & Tools Integration

6.1 Real-World Capstone Projects
Students will choose one or more projects to complete:
- Sales Data Analysis
- E-commerce Customer Analysis
- Financial/Stock Market Analysis
- Healthcare Data Insights
- HR Analytics

6.2 End-to-End Workflow
- Data Collection
- Cleaning and Wrangling
- Exploratory Data Analysis
- Visual Storytelling
- Reporting & Dashboard Creation

6.3 Resume, Portfolio & Job Preparation
- Resume Building for Data Analyst Roles
- Building a GitHub Portfolio
- Preparing for Interviews: Common Questions
- Communication & Presentation Skills

💼 Tools Covered:
- Excel
- Python (NumPy, Pandas, Matplotlib, Seaborn)
- SQL (MySQL / PostgreSQL)
- VS Code
- Jupyter Notebook
- Tableau / Power BI
- Google Sheets & Google Data Studio (Looker Studio) (Optional)