Course: Data Analysis using Python

Duration: 50 hrs

Title	Data Analysis using Python
Sub-Topics	**Introduction to Python Programming (Basics) (20 hours)** Introduction to Python and Setup Installing Python and setting up a coding environment (Jupyter, VSCode) Running simple Python programs Python Basics Variables, data types (integers, floats, strings, booleans) Conditional statements (if, else, elif) Loops: for and while loops with examples Functions and Modules Writing reusable functions and understanding scope Importing Python libraries (standard libraries and third-party libraries) Data Structures in Python Lists, tuples, sets, and dictionaries Basic operations on data structures (adding, removing, updating items) **Introduction to Data Handling with Python (10 hours)** Introduction to NumPy Creating arrays and performing basic operations Indexing, slicing, and reshaping arrays Introduction to pandas Creating DataFrames from CSV files Basic data operations: viewing, filtering, and sorting data Accessing rows and columns, handling missing data **Data Cleaning and Manipulation with Python (12 hours)** Data Cleaning Removing or imputing missing data Removing duplicates and outliers

	Handling categorical and numeric data Manipulating Data with pandas Grouping data for aggregation and analysis Merging and joining DataFrames Applying functions to data (using apply, map, etc.) **Data Visualization in Python (8 hours)** Introduction to Matplotlib Creating basic plots: line plots, bar plots, histograms Customizing plots: adding labels, titles, legends, and gridlines
Duration in Hrs	50
Departments	All Departments
Tools	Python
Learning Objectives	Develop Python programming skills for data handling and analysis. Perform data cleaning and manipulation using pandas and NumPy. Visualize data using Python libraries like Matplotlib and Seaborn.
Relevance in the industry	Python is a top programming language for data science, automation, and AI. Data analysis skills using Python are crucial in tech, finance, and research domains.