DATA SCIENCE WITH PYTHON



3 Hours per Day | **Total Duration: 30 Hours (10 Days)**

DAY 1 — Introduction To Data Science & Python

- Introduction to Data Science
- Data Science Life Cycle
- Applications of Data Science
- Python Fundamentals
- Variables, Data Types & Operators
- Conditional Statements & Loops
- Functions & Basic Programming
- **Practical:** Python Basics & Simple Programs

DAY 2 — Python Data Structures & Data Handling

- Lists, Tuples, Sets & Dictionaries
- Strings & String Operations
- Functions & Lambda Functions
- List Comprehension
- File Handling
- Exception Handling
- **Practical:** Data Handling Using Python

DAY 3 — Numpy For Data Science

- Introduction to NumPy
- Arrays & Array Operations
- Indexing & Slicing
- Mathematical & Statistical Operations
- Reshaping & Broadcasting
- Working with Multidimensional Arrays
- **Practical:** Numerical Data Analysis Using NumPy

DAY 4 — Pandas & Data Manipulation

- Introduction to Pandas
- Series & DataFrames
- Importing CSV / Excel Data
- Data Selection & Filtering
- Sorting & Aggregation
- Merging & Joining Data
- **Practical:** Data Manipulation Using Pandas

DAY 5 — Data Cleaning & Preprocessing

- Understanding Data Quality
- Handling Missing Values
- Removing Duplicates
- Data Type Conversion
- Outlier Detection
- Data Transformation & Encoding
- Feature Scaling
- **Practical:** Cleaning and Preparing a Real Dataset

DAY 6 — Data Visualization

- Introduction to Data Visualization
- Matplotlib Fundamentals
- Seaborn for Statistical Visualization
- Bar, Line, Pie & Scatter Charts
- Histograms & Box Plots
- Correlation & Heatmaps
- **Practical:** Creating Data Visualizations

DAY 7 — Exploratory Data Analysis (eda)

- Introduction to EDA
- Descriptive Statistics
- Data Distribution Analysis
- Correlation Analysis
- Identifying Patterns & Trends
- Outlier & Anomaly Analysis
- **Practical:** EDA on a Real-World Dataset

DAY 8 — Machine Learning Fundamentals

- Introduction to Machine Learning
- Supervised & Unsupervised Learning
- Training & Testing Data
- Feature Selection
- Regression Concepts
- Classification Concepts
- Model Evaluation
- **Practical:** Building a Basic ML Model

DAY 9 — Machine Learning With Python

- Introduction to Scikit-learn
- Linear & Multiple Regression
- Logistic Regression
- Decision Trees & Random Forest
- Clustering – K-Means
- Accuracy & Performance Metrics
- **Practical:** Implementing ML Algorithms

DAY 10 — Data Science Project & Applications

- Data Science Project Life Cycle
- Dataset Selection & Problem Definition
- Data Cleaning & EDA
- Data Visualization & Feature Engineering
- Machine Learning Model Development
- Model Evaluation & Interpretation
- Introduction to Data Science Deployment
- **Final Project:** End-to-End Data Science Project Using Python