

1-Month Structured Syllabus

Week 1: Introduction to Data Science & Python for Data Analysis

- What is Data Science? Real-world applications
- Data Science process/lifecycle
- Python refresher: variables, data types, functions, loops, file handling
- Introduction to Jupyter Notebooks
- Working with:
 - NumPy for numerical computing
 - Pandas for data manipulation and analysis
- Handling missing data, filtering, and grouping

Hands-on Activities:

- Basic data exploration with a CSV dataset
- Cleaning and transforming data

Week 2: Data Visualization & Exploratory Data Analysis (EDA)

- Importance of EDA in data science
- Data visualization tools:
 - Matplotlib and Seaborn
- Plot types: histogram, boxplot, scatterplot, heatmap
- Feature engineering and scaling
- Correlation analysis

Hands-on Activities:

- Create visual summaries of datasets
- Analyze trends and relationships in sample datasets

Week 3: Introduction to Machine Learning

- Machine Learning concepts: supervised vs. unsupervised learning
- Introduction to scikit-learn
- Building ML models:
 - Linear Regression, Logistic Regression, K-Nearest Neighbors
- Model evaluation:
 - Accuracy, Precision, Recall, F1-Score, Confusion Matrix, ROC Curve

Hands-on Activities:

- Build and evaluate ML models on cleaned datasets
- Predict outcomes using real-world data (e.g., Titanic, Iris)

Week 4: Practical session with Data Analysis and Visualization projects

- Housing Price Analysis & Predictions
- Titanic Dataset Analysis and Survival Predictions
- Iris Flower Dataset Analysis and Predictions
- Customer Churn Analysis