

*Master Data Analysis, Machine Learning, Visualization,
and Real-World Data Science Projects*

Course Objective

This 3-month professional program takes learners from Python and data fundamentals to data analysis, visualization, statistical analysis, machine learning, case studies, and a complete capstone project.

Module 1: Introduction to Data Science

- What is Data Science?
- Applications and tools overview
- Data Science lifecycle
- Introduction to Data Science technologies

Module 2: Data Collection

- Different data sources
- Structured and unstructured data
- APIs and data extraction
- Web scraping fundamentals
- Hands-on API calls and data collection

Module 3: Data Cleaning

- Handling missing data
- Noisy and duplicate data
- Data cleaning techniques
- Pandas and NumPy practical tasks

Module 4: Data Analysis

- Exploratory Data Analysis (EDA)
- Understanding datasets and variables
- Identifying patterns and trends
- Pandas for data analysis
- Matplotlib for visualization
- Practical EDA exercises

Module 5: Statistical Analysis

- Descriptive statistics
- Inferential statistics
- Probability concepts
- Hypothesis testing
- SciPy and StatsModels

Module 6: Data Manipulation

- Data wrangling techniques
- Filtering and sorting data
- Grouping and aggregation
- Merging and joining datasets
- Pandas transformations

Module 7: Data Engineering

- Introduction to ETL concepts
- Data pipelines
- Data transformation workflows
- Building practical data pipelines

Module 8: Machine Learning

- Introduction to Machine Learning
- Supervised Learning
- Unsupervised Learning
- Data preparation for ML
- Building and evaluating ML models

Module 9: Visualization, Case Studies & Mini Projects

- Charts and data storytelling
- Seaborn and Plotly
- Introduction to Tableau dashboards
- Business use cases and industry case studies
- Hands-on mini projects

Module 10: Capstone Project & Certification

- Data collection and preprocessing
- Exploratory Data Analysis
- Machine Learning model implementation
- Basic model deployment
- Final presentation and evaluation
- Course completion certification