

Data Science Course Content

1. Introduction to Data Science
2. Python for Data Science (Hands on)
3. Mathematics and Statistics
4. SQL and Data Handling (Hands on)
5. Data Visualization and EDA (Hands on)
6. Machine Learning (Hands on)
7. Deep Learning
8. Natural Language Processing
9. Time Series and Recommender Systems
10. MLOps and Deployment
11. Capstone Projects

Introduction to Data Science

- Data Science Lifecycle, Roles, and Tools
- Problem Framing, CRISP-DM Methodology

Python for Data Science (Hands on)

- Python Basics, OOP, File Handling, Virtual Environments
- NumPy, Pandas, Data Wrangling
- Jupyter Notebooks, Git and GitHub

Mathematics and Statistics

- Linear Algebra, Calculus Basics for ML
- Probability, Distributions, Sampling
- Hypothesis Testing, Confidence Intervals

SQL and Data Handling (Hands on)

- SQL Querying, Joins, Window Functions
- Working with APIs and Web Scraping
- Data Cleaning and Feature Engineering

Data Visualization and EDA (Hands on)

- Matplotlib, Seaborn, Plotly
- Exploratory Data Analysis Techniques

Machine Learning (Hands on)

- Supervised Learning: Linear and Logistic Regression, Decision Trees, Random Forest, SVM, KNN
- Ensemble Methods: Bagging, Boosting, XGBoost, LightGBM
- Unsupervised Learning: K-Means, Hierarchical, DBSCAN, PCA
- Model Evaluation, Cross Validation, Hyperparameter Tuning

Deep Learning

- Neural Networks, Backpropagation, Activation Functions
- CNNs, RNNs, LSTMs with TensorFlow and PyTorch
- Transfer Learning

Natural Language Processing

- Text Preprocessing, TF-IDF, Word Embeddings
- Sentiment Analysis, Text Classification
- Transformers and Large Language Models Overview

Time Series and Recommender Systems

- ARIMA, Prophet, Forecasting Techniques
- Collaborative and Content-Based Filtering

MLOps and Deployment

- Model Deployment with Flask and FastAPI
- Docker Basics, Experiment Tracking with MLflow
- Cloud Deployment Overview

Capstone Projects

- End-to-End Projects, Portfolio, and Interview Preparation