Data Science Course: 80 Lectures (45 min Each)

Module 1: Introduction & Basics (Lectures 1-6)

- Lecture 1: Introduction to Data Science, Uses & Applications
- Lecture 2: Data Science Workflow & Lifecycle
- Lecture 3: Required Skills and Industry Roles
- Lecture 4: Setting up Python Environment (Anaconda, Jupyter, IDEs)
- Lecture 5: Introduction to Git & Version Control
- Lecture 6: Introduction to Essential Libraries – Numpy, Pandas

Module 2: Programming Foundations (Lectures 7-14)

- Lectures 7-8: Python Programming Refresher (Data types, Control structures)
- Lectures 9-10: Functions, Modules, File Handling
- Lectures 11-12: Data Structures (List, Dictionary, Set, Tuple)
- Lecture 13: Error Handling & Debugging
- Lecture 14: Intro to R for Data Science

Module 3: Data Handling & Cleaning (Lectures 15-20)

- Lecture 15: Data Collection (APIs, Web Scraping, Databases)
- Lecture 16: Reading & Writing Data (CSV, Excel, SQL, JSON)
- Lecture 17: Data Cleaning: Handling Missing & Duplicates
- Lecture 18: Data Transformation, Normalization
- Lecture 19: Data Wrangling with Pandas
- Lecture 20: Exploratory Data Analysis – Univariate & Bivariate

Module 4: Statistics & Probability (Lectures 21-29)

- Lectures 21-22: Descriptive Stats (Mean, Median, Mode, SD)
- Lectures 23-24: Probability Basics, Distributions (Normal, Binomial)
- Lectures 25-26: Inferential Statistics, Hypothesis Testing
- Lectures 27-28: Correlation & Regression
- Lecture 29: Bayesian Statistics

Module 5: Data Visualization (Lectures 30-34)

- Lecture 30: Visualization Principles
- Lecture 31: Matplotlib for Plots
- Lecture 32: Seaborn for Statistical Charts
- Lecture 33: Advanced Visuals – Plotly, Dash

- Lecture 34: Business Dashboards – Power BI/Tableau

Module 6: Data Structures & Algorithms (Lectures 35-40)

- Lecture 35: Basic Data Structures in Python
- Lecture 36: Searching & Sorting Algorithms
- Lecture 37: Complexity Analysis (Big O, Time/Space Complexity)
- Lecture 38: Trees & Graphs for Data Science
- Lecture 39: Hashing, Queues, Stacks
- Lecture 40: Practical Problem-Solving for Data

Module 7: Machine Learning Foundations (Lectures 41-51)

- Lecture 41: ML Concepts – Types, Applications
- Lecture 42: Supervised Learning Overview
- Lecture 43: Linear Regression
- Lecture 44: Logistic Regression
- Lecture 45: Train/Test Split, Cross Validation
- Lecture 46: Decision Trees, Random Forest
- Lecture 47: Support Vector Machines (SVM)
- Lecture 48: K-Nearest Neighbors (KNN)
- Lecture 49: Model Evaluation & Metrics (Accuracy, Precision, Recall, F1)
- Lecture 50: Feature Engineering & Selection
- Lecture 51: Hyperparameter Tuning & Grid Search

Module 8: Unsupervised & Advanced ML (Lectures 52-56)

- Lecture 52: Clustering (K-Means, Hierarchical)
- Lecture 53: Principal Component Analysis (PCA)
- Lecture 54: Anomaly & Outlier Detection
- Lecture 55: Association Rule Mining
- Lecture 56: Intro to Recommendation Systems

Module 9: Deep Learning & Neural Networks (Lectures 57-63)

- Lecture 57: Deep Learning Concepts, Neural Network Basics
- Lecture 58: Introduction to TensorFlow & PyTorch

- Lecture 59: Building ANN for Classification/Regression
- Lecture 60: Convolutional Neural Networks (CNNs)
- Lecture 61: Recurrent Neural Networks (RNNs) & LSTMs
- Lecture 62: Generative AI and Large Language Models Intro
- Lecture 63: Model Evaluation in Deep Learning

Module 10: Natural Language Processing (Lectures 64-67)

- Lecture 64: Text Data Preprocessing, Tokenization
- Lecture 65: Text Classification & Sentiment Analysis
- Lecture 66: Word Embeddings (Word2Vec, BERT Overview)
- Lecture 67: Chatbots & Language Models Trends

Module 11: Big Data & Cloud (Lectures 68-71)

- Lecture 68: Big Data Concepts (Hadoop, Spark, Kafka)
- Lecture 69: NoSQL DB (MongoDB), Distributed Computing
- Lecture 70: Cloud for Data Science (AWS, GCP, Azure Overview)
- Lecture 71: Deploying Models in Cloud Environment

Module 12: Data Ethics & Privacy (Lectures 72-73)

- Lecture 72: Data Privacy Laws (GDPR, HIPAA)
- Lecture 73: Ethics, Fairness, Bias in AI Models

Module 13: Special Topics & Latest Trends (Lectures 74-76)

- Lecture 74: Augmented Analytics, AutoML
- Lecture 75: Edge Computing, Quantum Computing in DS
- Lecture 76: Real-Time & Streaming Data Analytics

Module 14: Industry Projects & Portfolio (Lectures 77-80)

- Lecture 77: Mini Capstone Project 1 – EDA + ML Implementation
- Lecture 78: Mini Capstone Project 2 – Deep Learning/NLP Project
- Lecture 79: Collaborative Data Project (Group/Team)
- Lecture 80: Presentation, Resume, and Interview Preparation Workshop