Module 1: Introduction to AI and ML

What is Artificial Intelligence?

What is Machine Learning?

Types of Machine Learning (Supervised, Unsupervised, Reinforcement)

Real-world Applications

Module 2: Mathematical Foundations (Light Version)

Basics of Linear Algebra (vectors, matrices)

Probability and Statistics essentials

Introduction to Derivatives (for optimization)

Module 3: Python Programming for ML

Python basics (variables, loops, functions)

Data Structures (lists, dictionaries)

Introduction to Object-Oriented Programming

Module 4: Core ML Libraries

Numpy for Numerical Computing

Pandas for Data Manipulation

Matplotlib/Seaborn for Data Visualization

Scikit-learn for Basic Machine Learning

Module 5: Machine Learning Essentials

Dataset Splitting (Train/Test)

Underfitting vs Overfitting

Model Evaluation Metrics (Accuracy, Precision, Recall, F1-Score)

Module 6: Key Machine Learning Algorithms

Linear Regression

Logistic Regression

Decision Trees

K-Nearest Neighbors (KNN)

Support Vector Machines (SVM)

Naive Bayes Classifier

Module 7: Hands-on Mini Projects

Titanic Survival Prediction

Handwritten Digit Recognition (MNIST)

Spam Email Detection

Module 8: Introduction to Deep Learning (Optional)

What are Neural Networks?

Building First Neural Network with TensorFlow/Keras