MACHINE LEARNING
WITH AI



3 Hours per Day | **Total Duration: 30 Hours (10 Days)**

DAY 1 — Introduction To Ai & Machine Learning
- Introduction to AI, ML & Deep Learning
- AI in Business and Real-World Applications
- Machine Learning Life Cycle
- Types of Machine Learning
- Supervised, Unsupervised & Reinforcement Learning
- Introduction to Python for ML
- Practical: Basic AI/ML Examples

DAY 2 — Python for Machine Learning
- Python Fundamentals for ML
- NumPy & Pandas
- DataFrames & Data Manipulation
- Data Import and Export
- Data Visualization Basics
- Introduction to Scikit-learn
- Practical: Data Preparation Using Python

DAY 3 — Data Preprocessing & Feature Engineering
- Understanding ML Datasets
- Data Cleaning & Missing Values
- Categorical Data & Encoding
- Feature Selection
- Feature Scaling & Transformation
- Outlier Detection
- Train-Test Split
- **Practical:** Preparing Data for Machine Learning

DAY 4 — Supervised Learning: Regression
- Regression Concepts
- Simple & Multiple Linear Regression
- Polynomial Regression – Introduction
- Model Training & Prediction
- Performance Metrics
- Mean Absolute Error & Mean Squared Error
- Practical: Building a Prediction Model

DAY 5 — Supervised Learning: Classification
- Classification Concepts
- Logistic Regression
- Decision Trees
- Random Forest
- K-Nearest Neighbors (KNN)
- Confusion Matrix
- Accuracy, Precision, Recall & F1-Score
- Practical: Classification Model Development

DAY 6 — Unsupervised Learning
- Introduction to Unsupervised Learning
- Clustering Concepts
- K-Means Clustering
- Hierarchical Clustering – Introduction
- Customer / Market Segmentation
- Dimensionality Reduction – Introduction
- Practical: Customer Segmentation Using ML

DAY 7 — Ai-powered Machine Learning
- AI Tools for Machine Learning
- Generative AI & Machine Learning
- Using AI for Data Preparation
- AI-Assisted Feature Engineering
- AI-Assisted Model Development
- Prompt Engineering for ML Tasks
- Practical: Using AI Tools to Support ML Development

DAY 8 — Model Optimization & Advanced MI
- Overfitting & Underfitting
- Cross-Validation
- Hyperparameter Tuning
- Model Selection & Comparison
- Ensemble Learning
- Feature Importance
- Model Interpretability
- Practical: Improving ML Model Performance

DAY 9 — Ai Applications & Model Deployment
- Real-World AI/ML Applications
- Recommendation Systems – Introduction
- Predictive Analytics
- NLP & Computer Vision – Overview
- ML Model Deployment Concepts
- APIs & Cloud-Based ML – Introduction
- Practical: Deploying / Demonstrating a Basic ML Model

DAY 10 — End-to-end AI & MI Project
- Problem Definition & Dataset Selection
- Data Cleaning & Preprocessing
- Exploratory Data Analysis
- Feature Engineering
- Model Building & Evaluation
- AI-Assisted Model Improvement
- Results Interpretation & Presentation
- Final Project: End-to-End Machine Learning Application with AI