Artificial Intelligence & Machine Learning Training – Syllabus

Module 1: Introduction to AI and Machine Learning

- What is Artificial Intelligence?
- Types of AI: Narrow, General, and Super AI
- Introduction to Machine Learning
- Difference between AI, ML, and Deep Learning
- Real-world Applications of AI and ML

Module 2: Python Programming for AI/ML

- Basics of Python Programming
- Python Libraries for AI/ML: NumPy, Pandas, Matplotlib, Scikit-learn
- Data Types, Functions, Loops, and OOP Concepts
- Working with DataFrames and Data Visualization

Module 3: Mathematics for Machine Learning

- Linear Algebra: Vectors, Matrices
- Probability and Statistics Basics
- Mean, Median, Mode, Variance, and Standard Deviation
- Introduction to Hypothesis Testing
- Basics of Calculus and Gradient Descent

Module 4: Supervised Learning

- Introduction to Supervised Learning
- Regression Algorithms: Linear Regression, Multiple Regression
- Classification Algorithms: Logistic Regression, Decision Trees, Random Forest
- Model Evaluation: Confusion Matrix, Accuracy, Precision, Recall, F1-Score

Module 6: Deep Learning Basics

- Introduction to Neural Networks
- Perceptron Model and Activation Functions
- Building a Simple Neural Network using TensorFlow/Keras
- Forward and Backward Propagation
- Introduction to Convolutional Neural Networks (CNNs)

Module 7: Natural Language Processing (NLP)

- Introduction to NLP Concepts
- Text Preprocessing: Tokenization, Stemming, Lemmatization
- Building Text Classification Models
- Working with Sentiment Analysis
- Introduction to Transformers (Basics)

Module 8: Computer Vision

- Basics of Computer Vision
- Image Classification with CNNs
- Object Detection and Image Segmentation Concepts
- Real-time Image Processing (Introduction Level)

Module 9: Model Deployment

- Saving and Loading ML Models
- Introduction to Model Deployment using Flask
- Building and Hosting ML Web Applications
- Basics of Deploying Models to Cloud Platforms (AWS, Azure)

Module 10: Real-Time Projects

- End-to-End Machine Learning Project (Predictive Model)
- Building a Real-Time AI Project (e.g., Chatbot, Image Classifier)
- Model Tuning and Final Deployment

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