

AI-ML

Course Structure

Duration – 40 Hours (2 Months)



Module 1: Introduction to AI/ML & Python Setup -- 3 Hours

- **Concepts:** History of AI, AI vs. ML vs. Deep Learning, supervised vs. unsupervised learning.
- **Tools:** Setting up Jupyter Notebooks, Git/GitHub, Introduction to Windows Subsystem for Linux (WSL).
- **Python Essentials:** Basic syntax, data types, control structures (loops, if-else), functions.

Module 2: Data Preprocessing & Exploratory Data Analysis (EDA) -- 5 Hours

- **Libraries:** NumPy (numerical analysis) and Pandas (data manipulation).
- **Techniques:** Data cleaning, handling missing data (NaN), data transformation, grouping, and aggregation.
- **Visualization:** Matplotlib/Seaborn for data plotting.

Module 3: Mathematics for ML -- 4 Hours

- **Statistics:** Central Tendency (Mean, Median, Mode), Standard Deviation, Variance, Probability basics.
- **Linear Algebra:** Vectors, Norms, Matrices, Matrix Operations, Eigenvalues/Eigenvectors.

Module 4: Machine Learning Algorithms -- 8 Hours

- **Regression:** Linear Regression, Logistic Regression, Lasso/Ridge.
- **Classification:** K-Nearest Neighbors (KNN), Decision Trees, Support Vector Machines (SVM), Random Forests.
- **Clustering:** Unsupervised learning, K-Means Clustering, Dimensionality Reduction (PCA).



Module 5: Deep Learning Basics -- 5 Hours

- **Neural Networks:** Introduction to Perceptron, Multi-Layer Perceptron (MLP).
- **Frameworks:** Introduction to TensorFlow/Keras or PyTorch.
- **CNNs:** Basics of Convolutional Neural Networks for Image Processing.

Module 6: GenAI & Deployment Basics -- 5 Hours

- **Generative AI:** Introduction to Large Language Models (LLMs), Prompt Engineering, RAG (Retrieval-Augmented Generation).
- **Deployment:** Model saving, API creation (FastAPI), basics of Cloud Deployment.



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