Proleed
ACADEMY

AI & Machine Learning Training Course

CURRICULUM

Module I – Foundations of Artificial Intelligence

- Definition and Scope of AI
- History and Evolution of AI
- Applications of AI in Real Life
- Types of AI: Narrow, General, Super
- Weak AI vs Strong AI
- AI vs Machine Learning vs Deep Learning
- Symbolic AI and Classical Approaches
- Intelligent Agents
- Turing Test and Rational Agents
- Ethics and Social Implications of AI

Module II – Python for AI

- Introduction to Python Programming
- Data Types, Variables, and Operators
- Control Structures and Loops
- Functions and Lambda Expressions
- Lists, Tuples, Dictionaries, Sets
- File Handling in Python
- Exception Handling
- Modules and Packages
- Object Oriented Programming
- Introduction to Virtual Environments

Module III – Numpy for Numerical Computation

- Introduction to NumPy and Its Importance
- Creating and Working with ndarrays
- Array Indexing, Slicing, and Iteration
- Array Operations
- Mathematical and Statistical Functions
- Reshaping, Stacking, and Splitting Arrays
- Linear Algebra Operations (Dot Product, Matrix Inversion, Determinants)
- Random Module – Generating Random Numbers
- Vectorization for Performance Optimization
- Real-world Examples: Image Representation, Computation Tasks

Module IV – Pandas for Data Manipulation

- Introduction to Pandas: Series and DataFrames
- Importing and Exporting Data (CSV, Excel, JSON)
- Indexing, Slicing, and Subsetting Data
- Data Cleaning: Handling Missing Values, Duplicates, Outliers
- Data Transformation: Apply, Map, Lambda Functions
- Filtering and Conditional Selection
- Merging, Joining, and Concatenating DataFrames
- Grouping and Aggregation (GroupBy)
- Pivot Tables and Crosstabs
- Time Series Handling
- Basic Descriptive Statistics and EDA

Module V – Matplotlib for Data Visulization

- Introduction to Data Visualization and Matplotlib
- Basic Plots: Line, Bar, Scatter, Histogram, Pie
- Customizing Plots: Titles, Labels, Legends, Colors, Styles
- Multiple Plots and Subplots
- Working with Figures and Axes Objects
- Annotations and Texts
- Plot Styling and Themes
- Saving Figures in Various Formats
- 3D Plotting (Optional: mpl_toolkits)
- Integrating Matplotlib with NumPy and Pandas

Module VI – Data Handling and Preprocessing

- Understanding Structured and Unstructured Data
- Data Collection Methods
- Data Cleaning and Imputation
- Feature Engineering
- Feature Scaling (Normalization, Standardization)
- Handling Missing and Outlier Values
- Encoding Categorical Variables
- Data Splitting: Train/Test/Validation
- Data Visualization for EDA
- Data Pipelines and Automation

Module VII – Foundations of Machine Learning

- Machine Learning Introduction
- Feature Extraction
- Fine Tuning Hyperparameters
- Semi-Supervised
- Gradient descent
- Overfitting and Underfitting
- Learning Curves and Model Diagnostics
- Regression
- GoogleColab

Module VIII – Supervised Machine Learning

- Introduction to Supervised Learning
- Linear Regression
- Logistic Regression
- Decision Trees
- Support Vector Machines (SVM)
- K-Nearest Neighbors (KNN)
- Naive Bayes Classifier
- Random Forests
- Gradient Boosting Machines (XGBoost, LightGBM)

Module IX – Unsupervised Machine Learning

- Introduction to Unsupervised Learning
- K-Means Clustering
- Hierarchical Clustering
- DBSCAN
- Principal Component Analysis (PCA)
- t-SNE for Dimensionality Reduction
- Anomaly Detection
- Association Rule Mining
- Recommendation Systems
- Evaluation of Clustering

Module X – Reinforcement Learning

- Basics of RL and Agents
- Environment and Reward System
- Markov Decision Process (MDP)
- Q-Learning
- Deep Q-Networks (DQN)
- Policy Gradient Methods
- Actor-Critic Models
- Exploration vs Exploitation
- OpenAI Gym Environments
- Real-life Applications of RL

Module XI – Scikit-Learn

- Introduction to Scikit-learn and Its Core Components
- Data Preparation and Preprocessing
- Building Supervised Learning Models
- Implementing Unsupervised Learning Techniques
- Evaluating Model Performance
- Improving Models with Validation and Tuning
- Automating Workflows with Pipelines
- Saving and Loading Models for Reuse
- Hands-on Mini Projects

Module XII – Robotics and AI

- Introduction to Robotics
- Supervised Learning for Perception
- Unsupervised Learning for Environment Mapping
- Reinforcement Learning for Control and Navigation
- Imitation Learning
- Sensor Fusion using ML Models

Module XIII – Ethics, Fairness, and Safety in AI

- Bias in AI Models
- Explainable AI (XAI)
- AI Governance and Compliance
- Data Privacy and Protection
- AI and Job Displacement
- Fairness Metrics
- Red-teaming and Safety Protocols
- Adversarial Attacks
- Responsible AI Development
- AI Regulation (EU, India, Global)

Module XIV – Model Deployment

- Model Serialization (Pickle, Joblib)
- REST APIs with FastAPI / Flask
- Model Deployment with Docker
- Model Monitoring and Logging
- Version Control for Models
- CI/CD for ML Pipelines
- Using Streamlit and Gradio
- Cloud Deployments (AWS, GCP, Azure)
- MLflow and Model Registry

Module XV – Model Testing and Performance Analysis

- Understanding Evaluation Metrics for Classification
- Evaluation Metrics for Regression
- Confusion Matrix Analysis
- Cross-Validation Techniques
- Bias-Variance Tradeoff and Model Generalization
- Hyperparameter Tuning
- Model Comparison and Benchmarking
- Handling Imbalanced Data
- Ensemble Techniques for Model Selection
- Model Interpretability and Trustworthiness

Module XVI – AI Machine Learning Project Development

- Defining Project Objectives
- Problem Formulation
- Data Collection and Cleaning
- Model Selection
- Training and Tuning
- Evaluation and Metrics
- Deployment Strategy
- Feedback Loop and Maintenance
- Documentation and Reporting
- Case Study Development

AI & Machine Learning Training Course

Schedule

Duration

4 Months

(16 Weeks)

Training Schedule

Weekdays Training

Monday to Friday

Weekend Training

Saturday & Sunday

Daily / Weekly Session

Live Online Instructor Led Session



AI & Machine Learning Training Course Fee

Limited Time Offer

Currency	Code	Offer Price	Regular Price
US dollar	USD	**850**	~~1300~~
Canadian dollar	CAD	**1150**	~~1600~~
Australian dollar	AUD	**1280**	~~1800~~
Sterling pound	GBP	**660**	~~1050~~
New Zealand dollar	NZD	**1320**	~~1900~~
Indian rupee	INR	**65,000**	~~95,000~~

Fee is inclusive of all applicable taxes and include examination and certification fee.

No other hidden charges of any type.

Thank You!

Thank you for downloading our curriculum! We're excited to be part of your learning journey. Feel free to reach out if you need more information.

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