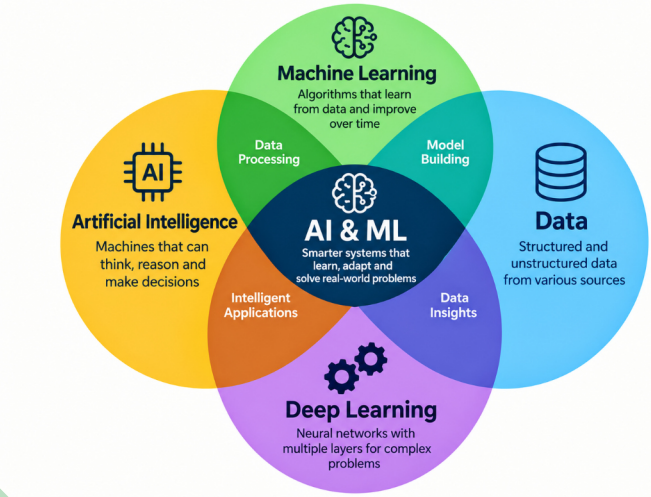
GENESIS
YOUR POTENTIAL. OUR PASSION



AI & Machine Learning Professional Course

Course Curriculum

Duration: 45 Days

Full Course Curriculum (13 Modules)

Introduction to Artificial Intelligence

- Introduction to Artificial Intelligence
- History and Evolution of AI
- AI Applications in Industries
- AI vs Machine Learning vs Deep Learning
- Types of AI
- Narrow AI
- General AI
- AI Project Lifecycle
- Real-world AI Use Cases
- AI Development Environment Setup

Tools

- Python Environment Setup
- Jupyter Notebook
- Google Colab

Python Programming for AI & ML

Introduction to Artificial Intelligence

- Python Fundamentals
- Variables and Data Types
- Operators
- Conditional Statements
- Loops
- Functions
- Lambda Functions
- Object-Oriented Programming
- Classes and Objects
- Exception Handling
- File Handling
- Modules and Packages

Python Data Structures

- Lists
- Tuples
- Sets
- Dictionaries

Libraries Covered

- NumPy
- Pandas

Data Analysis & Visualization

Concepts Covered

- Data Collection
- Data Understanding
- Data Cleaning
- Data Preprocessing
- Handling Missing Values
- Removing Duplicate Data
- Outlier Detection
- Data Transformation

Data Visualization

- Data Distribution
- Charts and Graphs

- Statistical Visualization

Libraries

- Matplotlib
- Seaborn

Project 1: Business Sales Analytics Dashboard

Mathematics for Machine Learning

Concepts Covered

Statistics

- Mean
- Median
- Mode
- Variance
- Standard Deviation
- Probability Basics
- Normal Distribution

Linear Algebra

- Vectors
- Matrices
- Matrix Operations

Calculus

- Derivatives
- Gradient Descent
- Optimization Concepts

Machine Learning Fundamentals



Concepts Covered

- What is Machine Learning
- Types of Machine Learning
- Machine Learning Workflow



Supervised Learning

- Training Data
- Model Building
- Testing Data
- Prediction



Model Evaluation

- Accuracy
- Recall
- Confusion Matrix
- Precision
- F1 Score

Data Preprocessing & Feature Engineering



Concepts Covered

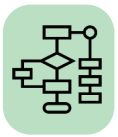
- Data Cleaning
- Feature Extraction
- Normalization
- Encoding Techniques
- Label Encoding
- Feature Selection
- Feature Scaling
- Standardization
- Techniques:
- One Hot Encoding

Supervised Machine Learning



Regression Algorithms

- Concepts:
- Linear Regression
- Multiple Regression
- Polynomial Regression
- Ridge Regression
- Lasso Regression



Classification Algorithms

- Concepts:
- Logistic Regression
- K Nearest Neighbor
- Decision Tree
- Random Forest
- Support Vector Machine
- Naive Bayes

Projects



House Price Prediction System

- Features:
- Property Details Input
- Price Prediction
- ML Model Deployment

Advanced Machine Learning

Concepts Covered



Ensemble Learning

- Bagging
- Boosting
- Random Forest
- XGBoost
- LightGBM



Unsupervised Learning

- Clustering
- K-Means
- Hierarchical Clustering
- DBSCAN



Dimensionality Reduction

- PCA

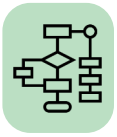
Projects



Loan Approval Prediction System

- Clustering
- Customer Risk Analysis
- Loan Decision Prediction

Deep Learning



Classification Algorithms

- Introduction to Neural Networks
- Artificial Neural Networks
- Perceptron
- Neurons
- Layers
- Activation Functions
- Forward Propagation
- Back Propagation
- Loss Functions
- Optimizers



Frameworks

- TensorFlow
- Keras

Computer Vision



Concepts Covered

- Digital Images
- Image Classification
- CNN Architecture
- Advanced:
- Image Processing
- OpenCV Basics
- Transfer Learning
- YOLO Object Detection

Projects



Face Recognition Attendance System

- Features:
- Face Identification
- Face Detection
- Automatic Attendance

Natural Language Processing (NLP)



Concepts Covered

- Introduction to NLP
- Text Cleaning
- Stop Words Removal
- Lemmatization
- Text Processing
- Tokenization
- Stemming



Feature Extraction

- Bag of Words
- Word Embeddings
- TF-IDF

NLP Models

- Bag of Words
- Transformers Introduction
- LSTM Basics
- BERT

Projects

AI Chatbot

- Features:
- Question Answering
- User Conversation
- Automated Response System

Generative AI

Concepts Covered

- Introduction to Generative AI
- Prompt Engineering
- Embeddings
- Retrieval Augmented Generation (RAG)
- LangChain
- Large Language Models (LLMs)
- AI APIs
- Vector Databases
- Tools:
- Hugging Face

Projects

AI Document Assistant

- Features:
- Ask Questions
- Information Extraction
- Upload Documents
- Summarization

Model Deployment & MLOps

Concepts Covered

- ML Model Saving
- Model Loading
- API Development
- Deployment Workflow
- Tools:
- Flask
- FastAPI
- Streamlit
- GitHub
- Cloud Introduction:
- AWS
- Azure
- Google Cloud

Hands-on Projects

- Business Sales Analytics Dashboard
- House Price Prediction System
- Loan Approval Prediction System
- Face Recognition Attendance System
- AI Chatbot
- AI Document Assistant (RAG-based)



Contact US

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