

Artificial Intelligence (AI) and Machine Learning (ML) (Open Source)

Learn to build AI and ML solutions spanning data science, deep learning, NLP and generative AI, including LangChain-based RAG applications.

40 Hours

DURATION

5

MODULES

24

TOPICS

22

HANDS-ON ACTIVITIES

COURSE OVERVIEW

This elaborate course provides a hands-on journey through AI and ML, covering Data Science, Deep Neural Networks, NLP, and Generative AI. Participants will explore regression, classification, clustering, CNNs, RNNs, and key NLP techniques like TF-IDF and Word2Vec. The course delves into generative AI, transformers, and LLMs with practical labs on text, image, and speech-based applications. Finally, it focuses on building AI applications using LangChain, LlamaIndex, and LangGraph, including prompt engineering, fine-tuning, chatbot creation, and Retrieval-Augmented Generation (RAG). Hands-on labs ensure practical exposure to real-world AI development.

WHO THIS COURSE IS FOR

This comprehensive 5-day course is designed for professionals and enthusiasts aiming to master Generative AI, with a focus on open-source platforms and hands-on labs. It is ideal for individuals with a background in Python and machine learning, including:

Data Scientists

Machine Learning Engineers

AI Researchers

Software Developers

IT Professionals

Data Analysts

AI Enthusiasts

Python Programmers

Deep Learning Specialists

Technical Leads and Managers

UX/UI Designers with an interest in AI

Automation Engineers

Research Scholars

AI Product Developers

LEARNING OBJECTIVES

- Apply regression and classification algorithms to structured data
- Implement unsupervised learning techniques such as K-means clustering
- Explain perceptrons, ANNs, CNNs and RNN variants like LSTM and GRU
- Apply NLP techniques such as TF-IDF and named entity recognition
- Describe transformer architecture and large language model fundamentals
- Develop text, image and speech based generative AI applications
- Apply prompt engineering techniques such as zero-shot and few-shot
- Build chatbot and RAG applications using LangChain and LangGraph

5 Modules, 24 Topics

01

4 Labs

Data Science

TOPICS

- Introduction to Data science
- Supervised and Unsupervised learning
- Supervised - Regression and Classification algorithms
- Unsupervised Learning algorithms

02

4 Labs

Deep Neural Network

TOPICS

- Understanding Perceptron
- Understanding Artificial Neural network / multi-layer perceptron
- Understanding Convolutional Neural network – CNN
- Padding, strides, pooling, Transfer learning etc
- Flattening layer and prediction
- Understanding Recurrent neural network
- RNN, LSTM, GRU

03

3 Labs

Natural Language Processing

TOPICS

- Converting language to numbers capturing semantic relationship
- Techniques Bag of words, TF-IDF, Word2Vec
- Name entity recognition

04

3 Labs

Generative AI

TOPICS

- Understanding background and backdrop of generative AI
- Understanding Transformer architecture
- Introduction to Hugging Face Large language models (LLM)

Application Development – Langchain, LlamaIndex

TOPICS

- Prompt engineering and techniques – zero shot, on shot and few shot
- Fine tuning model on custom dataset
- Simple Langchain application
- Creating a Conversational customised chatbot on LLM
- Vector stores and retrievers
- Understanding Retrieval augmented generating system
- Introduction to AI Agents - Lang graphs

HANDS-ON ACTIVITIES

Practise What You Learn

#	MODULE	ACTIVITY
01	Data Science	LAB ■ Data analysis insights ■ Regression ■ Classification ■ Unsupervised – K means clustering
02	Deep Neural Network	LAB ■ Perceptron ■ ANN ■ CNN prediction ■ RNN
03	Natural Language Processing	LAB ■ Sentiment Analysis lab on e-commerce Reviews dataset ■ Name entity recognition ■ Word cloud
04	Generative AI	LABS ■ Language text – Text completion, classification, translation, sentence similarity ■ Text to image, image to text, question answering Image based, Object detection, image captioning ■ Automatic speech recognition

#	MODULE	ACTIVITY
		LAB ■ Prompt engineering ■ Finetuning a base model on custom dataset ■ Simple langchain application
05	Application Development – Langchain, LlamaIndex	LABS ■ Chatbot creation ■ PDF RAG ■ QnA RAG ■ customise agent on Langgraphs Labs: vector store and retrievers

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training

Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

Flexi (Self-Paced)

1-on-1 Training

Ready to Get Started?

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