



ARTIFICIAL INTELLIGENCE & DATA SCIENCE

MACHINE LEARNING . DEEP
COMPUTER VISION . NLP . GENERATIVE
DATA ANALYTICS . MLOPS . CLOUD

DURATION	SPAN	MODULES	MODE
300–400 Hours	6–9 Months	17	Classroom • Online • Hybrid

01 COURSE OVERVIEW

A full master programme covering the data science and artificial intelligence stack from Python to deployed models. The programme runs from programming and mathematics through data science practice, machine learning, deep learning, computer vision and natural language processing, then into generative AI, prompt engineering, agents, retrieval-augmented generation, MLOps, analytics and cloud AI services.

Module durations are fixed in hours and every module carries practical work. The final 50 hours are given to industry projects selected from the capstone list.

WHO IT IS FOR

- Graduates targeting data science and AI roles
- Working software and IT professionals switching tracks
- Analysts moving from reporting into modelling
- Engineering and MCA students in final year

PREREQUISITES

Basic computer knowledge and programming fundamentals. Python recommended; revised in Module 2.

02 LEARNING OUTCOMES

01 Write production Python for data work with NumPy, Pandas and Plotly.

03 Run the full data science cycle from collection to feature engineering.

05 Build deep learning models in TensorFlow, Keras and PyTorch.

07 Build NLP pipelines for classification, summarisation and chatbots.

09 Deploy and monitor models with Docker, MLflow, FastAPI and cloud APIs.

02 Apply linear algebra, probability and optimisation to model behaviour.

04 Train, tune and evaluate supervised and unsupervised models.

06 Deliver computer vision systems for detection, recognition and OCR.

08 Apply generative AI, prompt engineering, agents and RAG to business cases.

10 Present findings in Power BI and Tableau dashboards.

03 MODULE STRUCTURE

17 MODULES

01 INTRODUCTION TO ARTIFICIAL INTELLIGENCE

10 HOURS

Introduction to AI

AI vs Machine Learning vs Deep Learning vs Generative AI

Types of AI

Future of AI

History and Evolution of AI

AI Applications Across Industries

AI Ethics and Responsible AI

PRACTICAL

AI DEVELOPMENT ENVIRONMENT SETUP

GOOGLE COLAB

JUPYTER NOTEBOOK

VS CODE INSTALLATION

02 PYTHON PROGRAMMING FOR AI

25 HOURS

Python Basics

Operators

Loops

Modules & Packages

File Handling

Virtual Environments

Variables & Data Types

Control Statements

Functions

Object-Oriented Programming

Exception Handling

LIBRARIES

NUMPY

PANDAS

MATPLOTLIB

PLOTLY

SEABORN

PRACTICAL

DATA CLEANING

DATA MANIPULATION

DATA VISUALIZATION

03 MATHEMATICS FOR AI

20 HOURS

Linear Algebra

Matrices

Probability

Bayes Theorem

Optimization

Cost Functions

Vectors

Eigenvalues

Statistics

Calculus Basics

Gradient Descent

PRACTICAL

MATRIX OPERATIONS USING NUMPY

STATISTICAL ANALYSIS

04 DATA SCIENCE WITH PYTHON

30 HOURS

Data Collection

Exploratory Data Analysis (EDA)

Data Visualization

Data Wrangling

Feature Engineering

Data Pipelines

PRACTICAL

KAGGLE DATASETS

REAL-WORLD DATA ANALYSIS

MINI PROJECT

SALES DATA DASHBOARD

05 MACHINE LEARNING

40 HOURS

Supervised Learning

Reinforcement Learning

Classification Algorithms

Random Forest

K-Means Clustering

Model Evaluation

Unsupervised Learning

Regression Algorithms

Decision Trees

Support Vector Machine (SVM)

Principal Component Analysis (PCA)

Hyperparameter Tuning

LIBRARIES

SCIKIT-LEARN

PRACTICAL

CUSTOMER CHURN PREDICTION

HOUSE PRICE PREDICTION

SPAM DETECTION

06 DEEP LEARNING

40 HOURS

Artificial Neural Networks (ANN)

Backpropagation

RNN

GRU

Attention Mechanism

Activation Functions

CNN

LSTM

Transformers

FRAMEWORKS

TENSORFLOW

KERAS

PYTORCH

PRACTICAL

IMAGE CLASSIFICATION

DIGIT RECOGNITION

TIME-SERIES PREDICTION

07 COMPUTER VISION

30 HOURS

Image Processing

Object Detection

Face Detection

OCR

YOLO

Image Classification

Object Tracking

Face Recognition

Image Segmentation

OpenCV

PRACTICAL

FACE RECOGNITION SYSTEM

VEHICLE DETECTION

NUMBER PLATE RECOGNITION

08 NATURAL LANGUAGE PROCESSING (NLP)

35 HOURS

Text Processing

Stop Words

Stemming

Word Embeddings

FastText

Named Entity Recognition

Text Summarization

Tokenization

Lemmatization

TF-IDF

Word2Vec

BERT

Sentiment Analysis

Machine Translation

LIBRARIES

NLTK

SPACY

HUGGING FACE

PRACTICAL

CHATBOT DEVELOPMENT

SENTIMENT ANALYSIS

RESUME CLASSIFIER

09 GENERATIVE AI

45 HOURS

Introduction to Large Language Models (LLMs)

Transformer Models

Context Windows

Multimodal AI

GPT Architecture

Tokens & Embeddings

Open-Source vs Closed Models

Responsible AI

POPULAR MODELS

GPT

CLAUDE

GEMINI

LLAMA

DEEPSEEK

MISTRAL

QWEN

PRACTICAL

AI CONTENT GENERATOR

AI RESEARCH ASSISTANT

AI CODE ASSISTANT

10 PROMPT ENGINEERING

20 HOURS

Zero-Shot Prompting

Few-Shot Prompting

Tree-of-Thought Prompting

Prompt Chaining

Structured Outputs

One-Shot Prompting

Chain-of-Thought Prompting

System Prompts

Prompt Optimization

PRACTICAL

PROMPT LIBRARY CREATION

BUSINESS AI ASSISTANT

11 AI AGENTS & AUTOMATION

35 HOURS

AI Agent Architecture

Planning

Function Calling

Workflow Automation

Memory

Tool Calling

Multi-Agent Systems

FRAMEWORKS

LANGCHAIN

LANGGRAPH

CREWAI

AUTOGEN

OPENAI AGENTS SDK

PRACTICAL

CUSTOMER SUPPORT AGENT

RESEARCH AGENT

HR ASSISTANT

EMAIL AUTOMATION AGENT

12 RETRIEVAL-AUGMENTED GENERATION (RAG)

30 HOURS

Document Processing

Embeddings

Chunking

Semantic Search

VECTOR DATABASES

HYBRID SEARCH

RAG ARCHITECTURE

VECTOR DATABASES

FAISS

CHROMADB

PINECONE

WEAVIATE

PRACTICAL

PDF CHATBOT

ENTERPRISE KNOWLEDGE ASSISTANT

13 MLOPS & AI DEPLOYMENT

35 HOURS

Model Versioning

Data Versioning

Docker

MLflow

Experiment Tracking

CI/CD for ML

Kubernetes

Weights & Biases

MONITORING & LOGGING

MODEL DEPLOYMENT

API DEVELOPMENT (FASTAPI)

STREAMLIT

GRADIO

PRACTICAL

DEPLOY ML MODELS

DEPLOY LLM APPLICATIONS

DOCKERIZE AI PROJECTS

14 DATA ANALYTICS

25 HOURS

POWER BI

DATA IMPORT

DATA CLEANING

DATA MODELING

DAX

POWER QUERY

DASHBOARDS

REPORTS

TABLEAU

DATA CONNECTIONS

CHARTS

DASHBOARDS

STORYTELLING

PRACTICAL

BUSINESS DASHBOARD

SALES ANALYTICS DASHBOARD

15 CLOUD AI SERVICES

20 HOURS

OpenAI API

Google Vertex AI

Hugging Face Inference API

Authentication

Azure OpenAI

AWS Bedrock

API Integration

Cost Optimization

PRACTICAL

BUILD AI APPLICATIONS USING CLOUD APIS

16 AI SECURITY & RESPONSIBLE AI

15 HOURS

AI Risks

Jailbreaking

Model Bias

AI Governance

Prompt Injection

Hallucinations

Privacy & Security

Ethical AI Development

17 INDUSTRY PROJECTS

50 HOURS

CAPSTONE PROJECTS

ENTERPRISE AI CHATBOT

AI RESUME ANALYZER

AI INTERVIEW COACH

AI MEDICAL ASSISTANT

AI LEGAL ASSISTANT

AI CUSTOMER SUPPORT SYSTEM

AI DOCUMENT SUMMARIZER

AI RESEARCH ASSISTANT

AI SALES FORECASTING

COMPUTER VISION ATTENDANCE SYSTEM

INTELLIGENT TRAFFIC MONITORING

PREDICTIVE MAINTENANCE SYSTEM

AI VOICE ASSISTANT

AI FINANCIAL ADVISOR

04 ASSESSMENT & CERTIFICATION

Module assignments and labs	25%
Mini projects	20%
Internal assessments	15%
Capstone project and review	40%

CERTIFICATION

Learners who complete all modules, submit the capstone project and clear the final review receive a course completion certificate from Kaizen Infinities Private Limited. Project work is documented for the learner's portfolio and GitHub profile, and interview preparation is included in the final week.

05 CAREER OUTCOMES

ROLES THIS PROGRAMME PREPARES FOR

DATA SCIENTIST

MACHINE LEARNING ENGINEER

AI ENGINEER

COMPUTER VISION ENGINEER

NLP ENGINEER

DATA ANALYST

MLOPS ENGINEER

GENERATIVE AI DEVELOPER

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