Introduction to AI Engineering Projects Training

Duration: **3 Day**

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Overview

What Can You Achieve with This Training?

- Learn how to **plan, design, and deliver AI engineering projects** from initial concept through to production.
- Identify business challenges where **artificial intelligence can generate measurable value** and develop practical project roadmaps.
- Build foundational skills in **Python, Pandas, data cleaning, and exploratory data analysis** to support AI initiatives.
- Understand the differences between **machine learning, deep learning, generative AI, and large language models**.
- Explore how to design **agentic AI systems** using planning, reasoning, memory, retrieval, and tool integration.
- Learn to incorporate **responsible AI governance, ethics, security, and risk management** throughout the project lifecycle.
- Gain practical experience through **hands-on labs, collaborative workshops, and a comprehensive capstone project**.

The **Introduction to AI Engineering Projects Training** is a **three-day, instructor-led programme** that introduces participants to the practical planning, design, governance, development, and delivery of artificial intelligence solutions.

Artificial intelligence is changing how organisations address challenges, deliver services, and create business value. However, delivering a successful AI solution requires more than choosing a model or writing effective prompts. It involves **strategic planning, data preparation, engineering practices, governance, risk management, and production readiness**.

This course provides a structured introduction to the **complete AI engineering project lifecycle**, helping participants understand how an AI initiative progresses from an initial business opportunity to a production-oriented solution.

The programme begins with the fundamentals of **AI engineering**, including team responsibilities, delivery challenges, cross-functional collaboration, and the business considerations that influence AI project selection.

Participants then develop foundational technical skills in **Python, Pandas, data cleaning, transformation, validation, and exploratory data analysis**. The course also introduces the key approaches behind **machine learning, deep learning, generative AI, and large language models (LLMs)**.

The following modules explore the design of **agentic AI solutions**, including planning, reasoning, tool

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integration, retrieval techniques, memory management, and human oversight.

A dedicated governance module addresses **responsible AI, ethical risks, privacy, security, explainability, and regulatory considerations**, helping learners understand how these factors influence trusted AI adoption.

The course also examines how prototypes can be prepared for **reliable, scalable, monitored, and secure production environments**.

Learning is reinforced through **instructor-led sessions, hands-on laboratories, collaborative workshops, and a capstone AI engineering project**. These activities help participants connect technical concepts with the organisational requirements involved in delivering real-world AI solutions.

Prerequisites

There are **no formal prerequisites** for this course.

However, participants are encouraged to have:

- **General digital and technical literacy**
- An interest in **artificial intelligence and emerging technologies**
- Familiarity with **business processes and problem-solving**
- A basic understanding of **data concepts**

Advanced programming experience is not required.

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Who Should Attend

This course is designed for professionals who want to understand both the**technical and organisational aspects of delivering AI solutions**.

It is particularly suitable for:

- **Aspiring AI engineers**
- **Software engineers and developers**
- **Technical consultants and solution engineers**
- **Data and analytics professionals**
- **Product managers and product owners**
- **Technical leads supporting AI initiatives**
- **Digital transformation and innovation professionals**

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What You Will Learn

By the end of this course, participants will be able to:

- Explain the scope of **AI engineering** and how it differs from related technical disciplines.
- Describe the **end-to-end lifecycle of an AI engineering project**.
- Understand the roles, responsibilities, and importance of **cross-functional collaboration** within AI teams.
- Assess **business challenges** and identify opportunities where AI can create value.
- Evaluate AI initiatives using **business value, ROI, and strategic priorities**.
- Develop **AI project roadmaps** and consider stakeholder expectations.
- Apply foundational **Python and Pandas** techniques to support data-related tasks.
- Use basic **data cleaning, transformation, validation, exploratory analysis, and visualisation** methods.
- Distinguish between **supervised learning, unsupervised learning, deep learning, generative AI, and large language models**.
- Recognise common **model evaluation approaches** and implementation risks.
- Design high-level **agentic AI solutions** using planning, reasoning, memory, retrieval, and tool integration.
- Explain the role of **human-in-the-loop design** in AI agent systems.
- Apply **responsible AI governance, ethics, privacy, security, and risk management** principles throughout an AI project.
- Assess the **reliability, scalability, monitoring, and operational ownership** requirements involved in moving AI systems to production.
- Prepare a **prototype-to-production transition plan** and evaluate production readiness.
- Communicate **AI project roadmaps and recommendations** clearly to technical and non-technical stakeholders.
- Combine business value, solution design, governance, and production planning in a**capstone AI engineering project**.

Outline

1. Introduction to AI Engineering

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This module introduces **AI engineering as a discipline** and explores how AI projects progress from initial ideas to production environments.

Topics Covered

- Understanding **what AI engineering is**
- **Roles and responsibilities within AI teams**
- The **AI project lifecycle**
- Common **delivery risks and challenges**
- **Cross-functional collaboration**

Hands-On Activity

- **AI Lifecycle Mapping Challenge:** Mapping the stages of an AI engineering project

2. AI Strategy and Business Value

This module explores how organisations identify, prioritise, and develop AI initiatives that deliver measurable business outcomes.

Topics Covered

- **Strategic drivers for AI adoption**
- **Evaluating AI opportunities**
- **Business value and Return on Investment (ROI)**
- **AI roadmapping**
- **Stakeholder engagement**

Hands-On Activity

- **Pitch Your AI Strategy:** Developing and presenting an AI strategy

3. Python and Data Skills

This module develops the foundational programming and data handling capabilities needed for AI engineering projects.

Topics Covered

- **Python fundamentals**
- Working with **Pandas**
- **Data cleaning and transformation**

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- **Data validation**
- **Exploratory Data Analysis (EDA)**
- **Data visualisation fundamentals**

Hands-On Lab

- **QuickBite Delivery Delays Data Exploration:** Exploring and analysing delivery delay data

4. Machine Learning and Deep Learning Essentials

This module introduces the main AI techniques used to build intelligent systems and examines their evaluation and implementation considerations.

Topics Covered

- **AI terminology and categories**
- **Supervised learning**
- **Unsupervised learning**
- **Deep learning fundamentals**
- **Generative AI**
- **Large Language Models (LLMs)**
- **Model evaluation**
- **Common implementation risks**

Hands-On Lab

- **Machine Learning Method Match-Up and Error Spotting:** Matching machine learning approaches to scenarios and identifying errors

5. Designing Agentic AI Solutions

This module explores the architecture and design principles behind**AI agents capable of handling increasingly complex tasks**.

Topics Covered

- **Agentic AI fundamentals**
- **Planning and reasoning**
- **Tool integration**
- **Retrieval techniques**

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- **Memory and context management**
- **Human-in-the-loop design**
- **Emerging architectural patterns**

Hands-On Activity

- **Design Your Agentic AI System:** Creating a high-level design for an agentic AI solution

6. Responsible AI Governance

This module examines the governance and risk considerations that help organisations develop and deploy AI responsibly.

Topics Covered

- **Responsible AI principles**
- **Ethical risks and mitigation strategies**
- **Legal and regulatory considerations**
- **Transparency and explainability**
- **Privacy and security**
- **Governance frameworks**

Hands-On Activity

- **Govern or Redesign?:** Evaluating whether an AI solution requires governance measures or design changes

7. From Prototype to Production

This module introduces the technical and operational considerations involved in moving AI solutions into production.

Topics Covered

- Differences between **prototype and production systems**
- **Reliability and scalability**
- **Monitoring and observability**
- **Security and compliance**
- **Operational ownership**
- **Production readiness assessments**

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Hands-On Lab

- **Build Your Transition Plan:** Preparing a plan for moving an AI prototype towards production

8. Capstone AI Engineering Project

In this final module, participants bring together the concepts covered throughout the course to design an **end-to-end AI engineering solution**.

Topics Covered

- **AI project planning**
- **Solution design**
- **Governance and risk management**
- **Stakeholder communication**
- **Roadmap creation**
- **Production planning**

Hands-On Activity

- **AI Project Planning and Stakeholder Presentation:** Planning an AI project and presenting the proposed solution to stakeholders