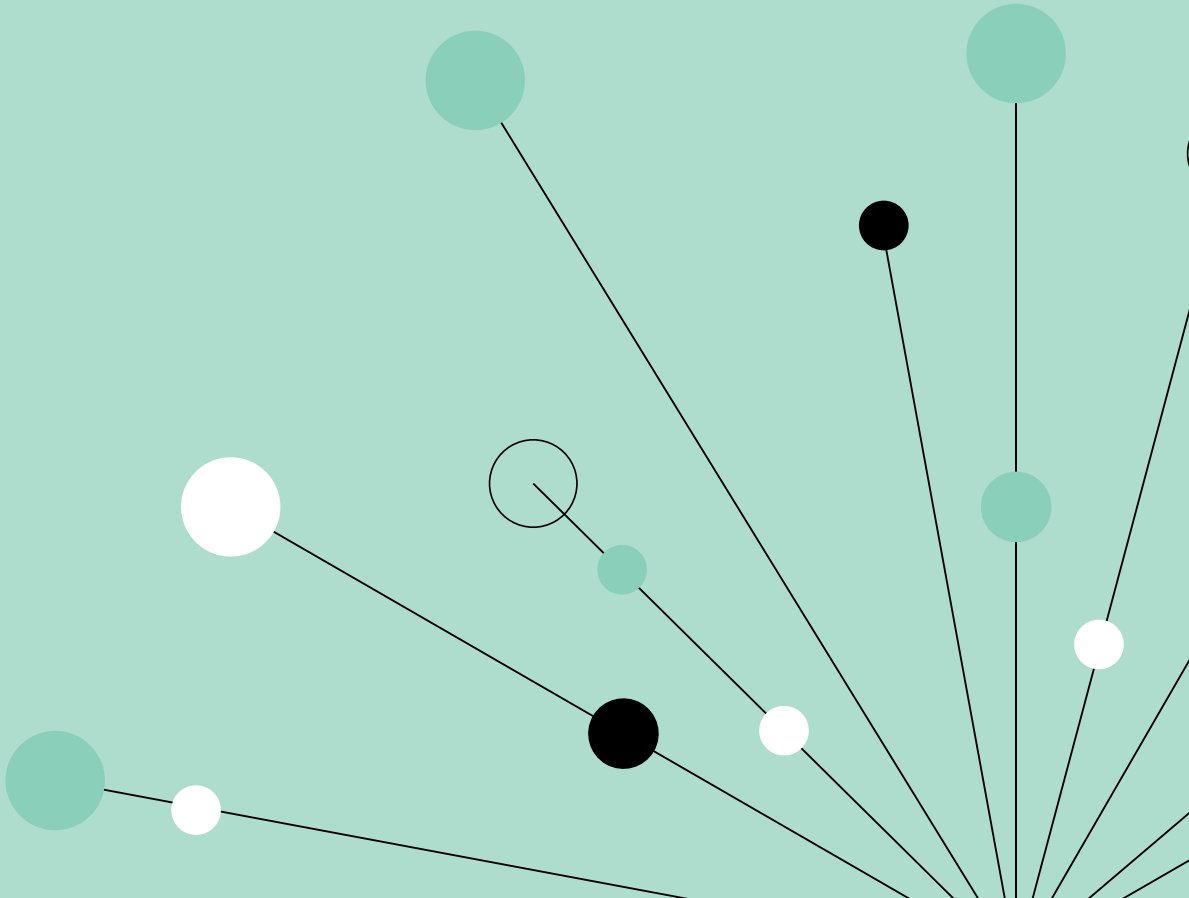
QA™
Learn. To Change.

Apprenticeships England

AI Engineer

Level 6 Apprenticeship

Programme Guide



QA.com

Why QA?

Endorsed by 4,000+ global clients, we are the leader in applied and cohort-based learning academies.

Today's biggest technological shifts are shaped by AI, cloud, and data.

In every technology revolution, there are winners and losers – and teams with applied skills make all the difference. We believe you can't change an organisation unless you change the capabilities of its people and ensure human and machine intelligence work together.

Success in numbers:

40+
Years of training experience

1,000+
AI, cloud & coding hands-on labs

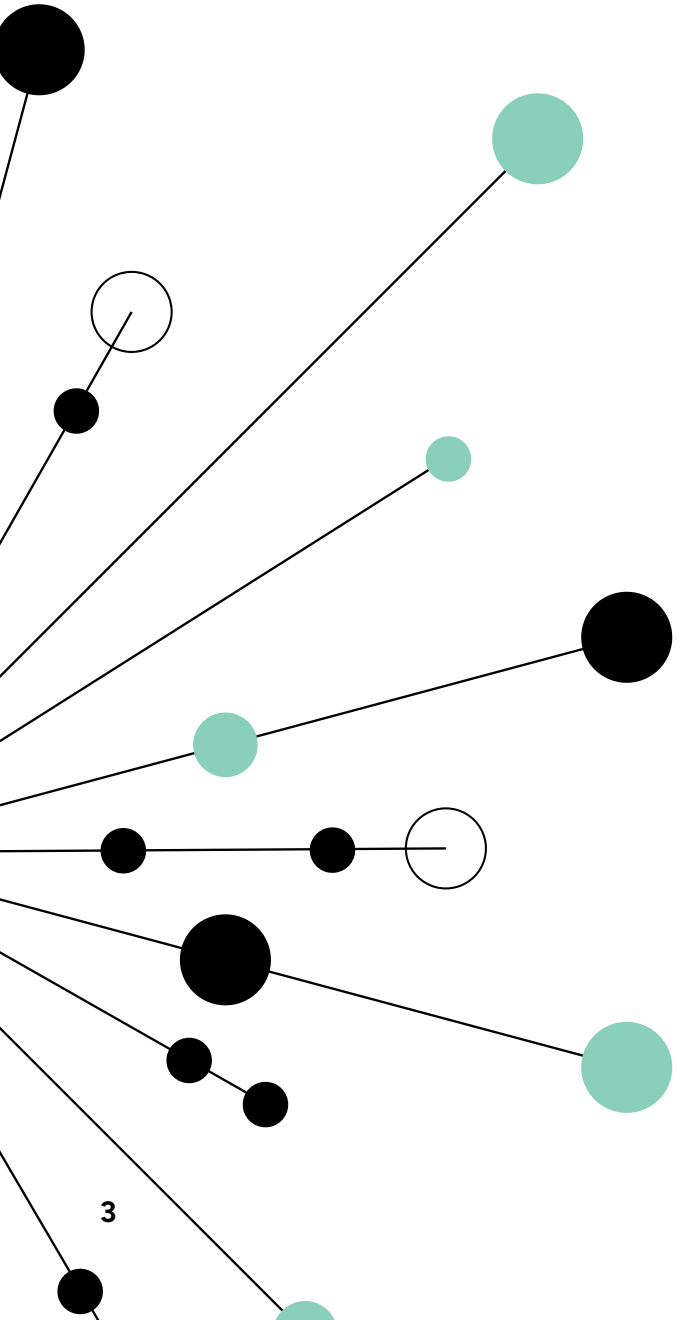
50,000+
Careers launched & accelerated

£500m+
Levy funds invested

24 hours
Feedback time for submissions

<1 minute
Response time to learner queries

Ready to explore how QA can support you?
Let's dive in!



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Creating Change

AI Engineering powers enterprise-grade Gen AI.

This programme equips your organisation with the core skills to deploy transformative AI and ML solutions that are secure, scalable and seamlessly integrate with core business platforms.

Our apprenticeships drive business results by empowering organisations to apply skills consistently at speed and scale.

Boost Operational Efficiency

Automate processes to reduce costs and improve accuracy.

Scale AI and ML Solutions

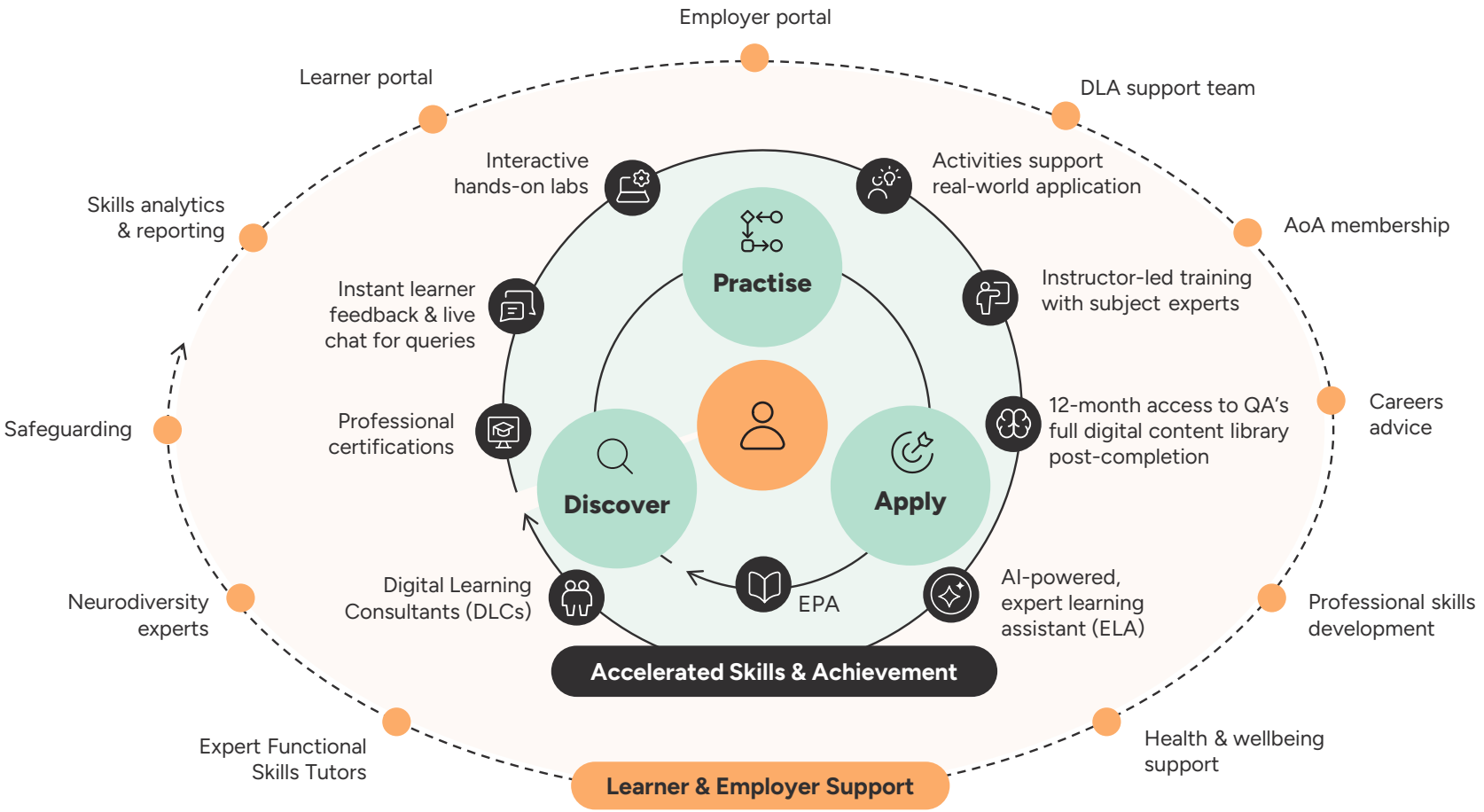
Go from piloting to operationalising AI for business impact.

Promote Responsible AI

Ensure ethical, transparent, and bias-free AI decision-making.

Digital by Design

Our market-leading approach accelerates skill development and achievement through our **Discover**, **Practise**, **Apply** methodology, ensuring that both learners and employers are fully supported throughout their programme.



Discover

Leveraging QA's learning platform, learners follow a development path focused on their job role.

Practise

Learners join instructor-led sessions, practise skills in hands-on, risk-free labs, and collaborate with peers.

Apply

Learnings are applied on the job through work-based activities at key stages, supported and reviewed by specialist DLCs.

Programme Overview

Details of standard: Machine Learning Engineer

Total cost: £22,000

Programme duration: 23 months

Live instructor sessions: 28 days

Delivered in collaboration with our strategic vendor partners:

Microsoft Solutions Partner
Microsoft Cloud
Training Services

databricks

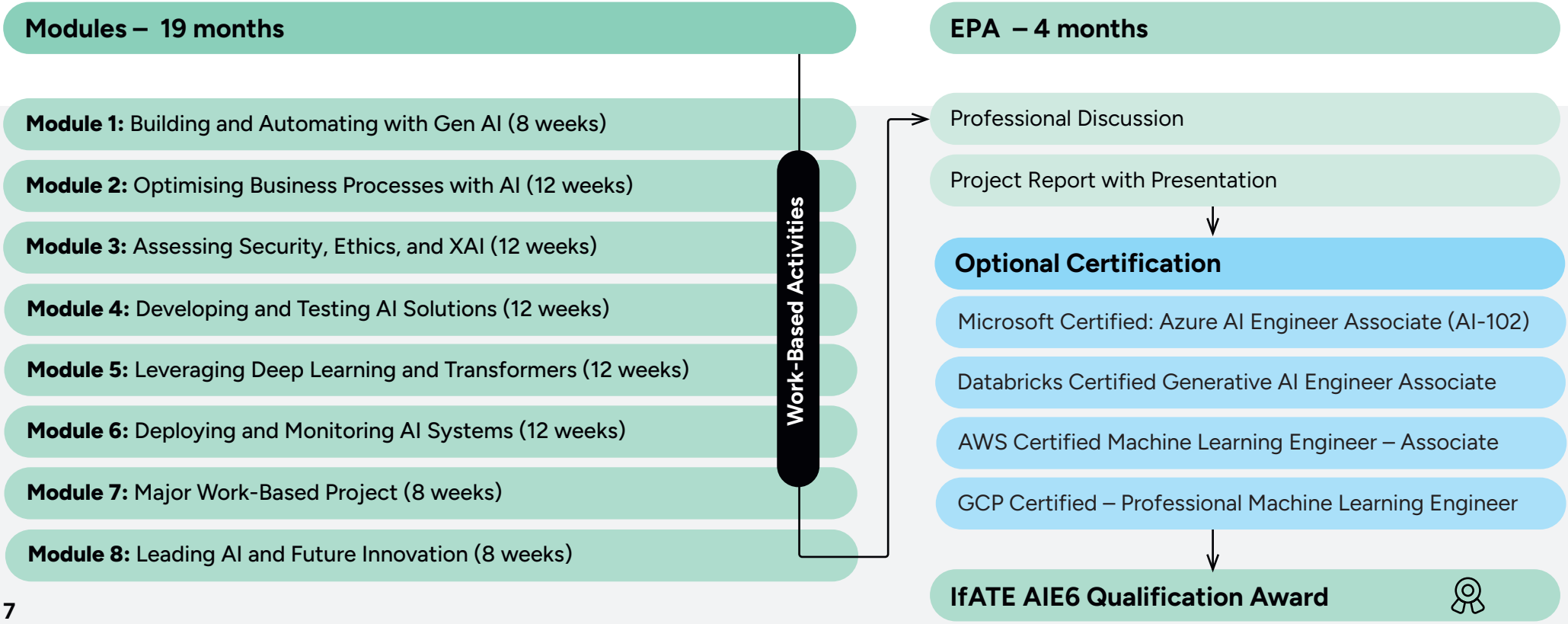
Experience QA's self-paced learning with interactive labs and AI-powered learning assistant.

- AI System Development and Automation
- AI Solution Design and Testing
- Deep Learning and Transformers
- Business Process Optimisation with AI
- Security, Ethics, and Explainable AI
- Leading AI and Future Innovation

Learner Journey

The AI Engineer programme integrates live and online workshops with self-paced learning, employing a guided discovery approach for individual learner contexts.

Learners are assigned a Digital Learning Consultant (DLC) for personalised coaching and support. These specialists ensure their successful progress, wellbeing, and readiness for assessments.



Modules

Following each module, learners apply their newly acquired knowledge and skills to ongoing work projects.

01

Module 1:
Building and Automating with Gen AI

Introduces the fundamentals of generative AI – focusing on automating tasks using large language models (LLMs) and prompt engineering.

It examines how to design prototypes that deliver immediate business value, leveraging techniques like vector databases and orchestration frameworks.

Topics:

- Introduction to AI & Machine Learning
- Categorising Machine Learning Methods
- Foundational vs Fine-Tuned Models
- Natural Language Processing (NLP) & Computer Vision
- Generative AI & Prompt Engineering
- Responsible & Ethical AI
- ML Frameworks & Cloud Services
- Business Case & Project Planning

Live Instructor Sessions: 3 Days

02

Module 2:
Optimising Business Processes with AI

Explores how AI-driven solutions can streamline organisational workflows and enable data-informed decision-making, using CRISP-ML(Q) to define model objectives, evaluate ROI, and deliver automation benefits.

Topics:

- ML Lifecycle & CRISP-ML(Q)
- Comparing AI Project Methodologies
- ML Project Management & Risk
- Change Management & Version Control
- Deployment & Support Planning
- Gen AI Business Case & ROI
- Defining Gen AI Objectives & Metrics
- Stakeholder Engagement & Communication

Live Instructor Sessions: 4 Days

03

Module 3:
Assessing Security, Ethics, and XAI

Examines ethical, legal, and security challenges inherent in AI systems – including bias, privacy, and adversarial threats – with real-world case studies and XAI techniques for responsible solutions.

Topics:

- Data Security & Governance
- Generative AI Threats & Mitigation
- Compliance & AI Governance
- Ethical & Legal Risk Management
- Bias, Ethics & Data Privacy
- XAI Fundamentals & Tools
- Risk Analysis & Incident Response
- Cybersecurity Culture & Monitoring

Live Instructor Sessions: 4 Days

04

Module 4:
Developing and Testing AI Solutions

Covers classical ML through hands-on data wrangling, feature engineering, and model selection. It delves into building ML prototypes in Python with hyperparameter tuning and performance metrics.

Topics:

- Mathematical Foundations for AI
- Model Selection & Algorithm Choice
- Nonlinear & Reinforcement Learning
- Data Wrangling, Feature Engineering & Pre-processing
- Model Evaluation & Hyperparameter Tuning
- Advanced Programming, IDE, Workflow & ML Libraries
- Problem Solving & Software Evaluation
- ML Prototype Hackathon

Live Instructor Sessions: 5 Days

05

Module 5:
Leveraging Deep Learning & Transformers

Dives into advanced neural networks, from CNNs to transformers, for applications like image recognition and Natural Language Processing. Focuses on building and refining prototypes to apply state-of-the-art AI techniques.

Topics:

- Deep Learning & Transformers
- Continual Learning & Data Pipelines
- Problem Solving & Error Analysis
- Advanced Programming & Libraries
- Fine-Tuning Transformers
- Gen AI Model Testing & Validation
- Hyperparameter Tuning & Optimisation
- Deep Learning/Transformer Hackathon

Live Instructor Sessions: 5 Days

06

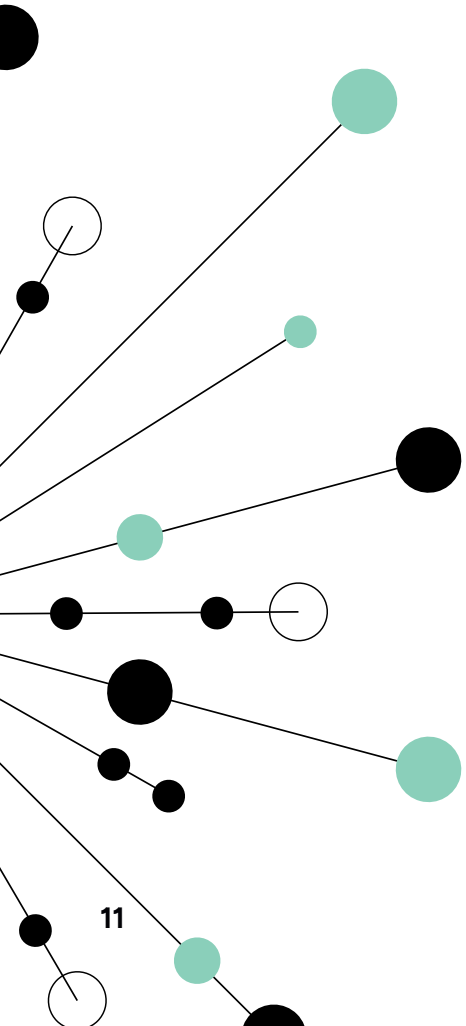
Module 6:
Deploying & Monitoring AI Systems

Explores the operational aspects of AI – from deployment strategies, MLOps pipelines, and model monitoring. It explores real-time inference, data drift detection, and capacity planning to ensure AI systems are scalable, robust, and efficient.

Topics:

- Deployment Strategies & MLOps
- Post-Deployment Monitoring & Data Drift Management
- Scaling, Capacity Planning & Futureproofing
- Sustainability, Environmental & Ethical AI
- Third Party AI Integration & Legacy Decommissioning
- Technology Roadmaps & Lifecycle Management
- Real-Time Interference & Optimisation
- Continuous Integration & Version Control

Live Instructor Sessions: 4 Days



07

Module 7:
Major Work-Based Project

Involves completing a business-relevant project aligned to professional role, forming a key part of the End-Point Assessment (EPA) to showcase AI/ML knowledge, skills, and behaviour in a real-world context.

Topics:

- Project Management Techniques & Methodologies
- Stakeholder Management
- Change Management
- Technical & Non-Technical Communication

Live Instructor Sessions: 0 Days

08

Module 8:
Leading AI and Future Innovation

Develops AI leadership – emphasising ethical decision-making, horizon scanning, and inclusive collaboration. It explores advancements in generative AI, sustainability, and visionary roadmaps to prepare organisations for future technological shifts.

Topics:

- Professional Ethics & Integrity in AI
- Leadership & Collaborative Culture
- Horizon Scanning & Emerging AI + Gen AI Trends
- Advanced Communication & Inclusivity
- Risk Awareness & Complex Project Handling
- Sustainable Mindset & Corporate Responsibility
- Knowledge Management & Technical Documentation

Live Instructor Sessions: 3 Days

Tools and Technologies

Business Understanding

- Azure DevOps
- Power BI
- Jupyter Notebooks

Data Understanding

- Azure Databricks
- Azure Cognitive Search
- pandas, NumPy
- NLTK, spaCy
- LangChain/Semantic Kernel

Data Preparation

- Azure Data Factory
- Azure Synapse
- spaCy, Regex, pandas
- LangChain
- Faker

Modelling (GenAI)

- Azure OpenAI Service
- Semantic Kernel
- GitHub Copilot
- Microsoft 365 Copilot
- Transformers (Hugging Face)
- PyTorch/TensorFlow
- DeepSpeed (Azure)

Evaluation

- Azure Machine Learning
- MLflow on Azure Databricks
- scikit-learn
- evaluate (Hugging Face)
- LangChain/Semantic Kernel

Deployment & Monitoring (MLOps)

- Azure Machine Learning Endpoints
- Azure Kubernetes Service (AKS)
- Azure Monitor, Application Insights
- FastAPI, Flask
- MLflow Model Registry
- DeepSpeed/MosaicML

End-Point-Assessment

We ensure all learners are fully prepared for their End-Point-Assessment (EPA) through our internal gateway process, maximising their success rates.

Assessment criteria:

01

Knowledge
Ability to convey knowledge effectively.

02

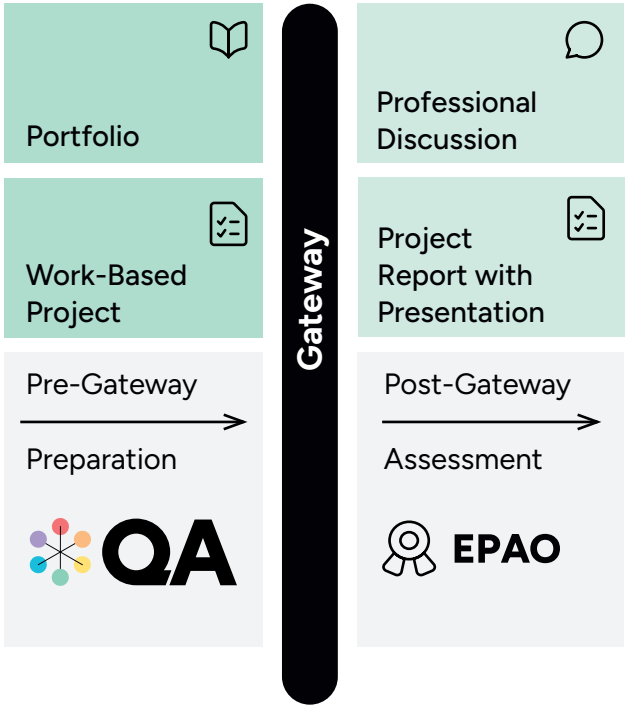
Skills
Demonstrate practical skills with confidence.

03

Behaviour
Exhibit professional workplace behaviour.

Explore the detailed assessment criteria within the **Machine Learning Engineer standard**.

EPA process:



Professional Discussion: Engage in a formal two-way conversation to showcase knowledge, skills, and behaviours.

Project Report with Presentation: Prepare a project report, demonstrate knowledge and achievements, and participate in a Q&A.

Ready to partner with us?

Let's talk:

0113 220 7150

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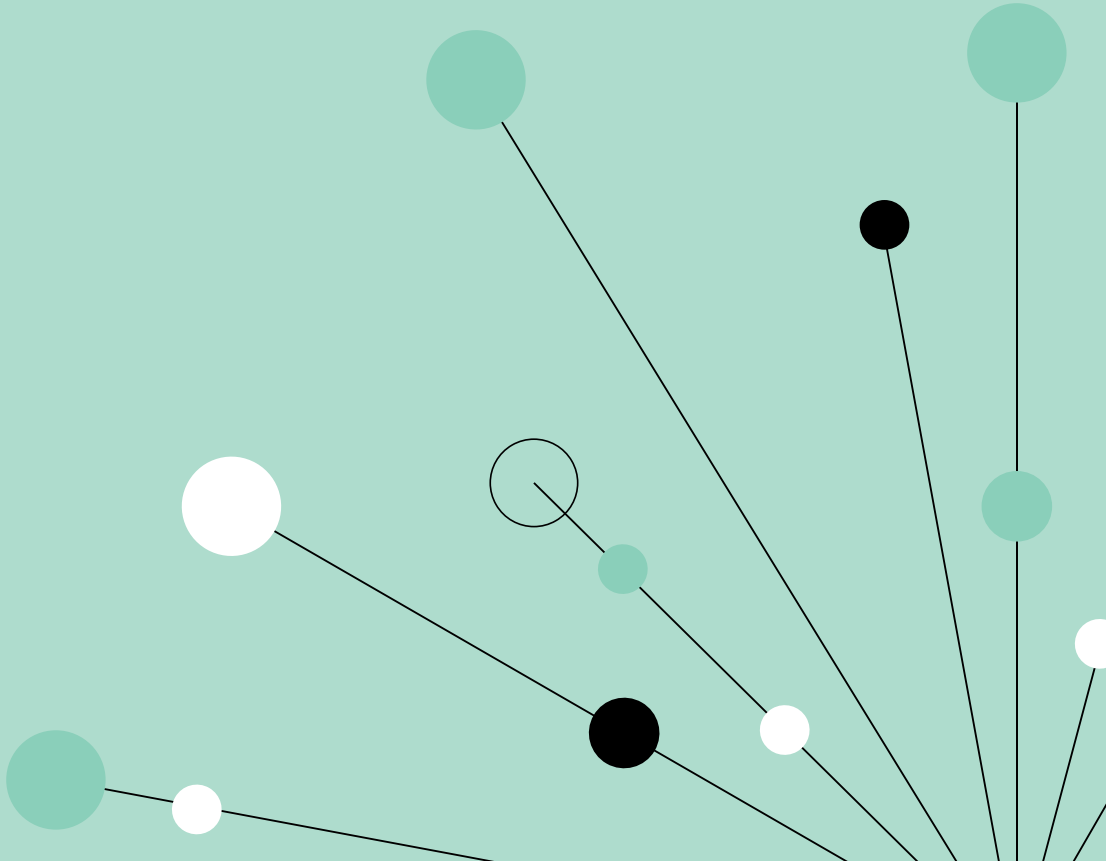

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