



Introduction to Artificial Intelligence

Professional Course Curriculum

Aligned with the **AWS Certified AI Practitioner (AIF-C01)** Certification

Stack IT Training · stackittraining.com

Course Overview

This comprehensive course prepares learners for the **AWS Certified AI Practitioner (AIF-C01)** certification while building practical, real-world AI and machine learning skills. No prior AI or cloud experience is required — the curriculum progresses from foundational concepts through advanced generative AI, responsible AI governance, and hands-on no-code agentic AI development.

Upon completion, learners will possess the knowledge and confidence to pass the certification exam, communicate AI value to stakeholders, and build intelligent, automated solutions using industry-leading AWS services.

Who Should Enroll

New to IT / Career Changers	Build knowledge from the ground up with structured, beginner-friendly content.
Business & Product Professionals	Business Analysts, Product Managers, and Marketing professionals seeking AI literacy.
Cloud & DevOps Engineers	Deepen expertise in AWS AI/ML services and MLOps practices.
Cloud Security Engineers	Understand AI security, compliance, and governance on AWS.
Project & Delivery Leaders	Project Managers, Product Owners, and Scrum Masters navigating AI-driven projects.
IT & Sales Leadership	IT Managers and sales professionals evaluating and communicating AI solutions.
No-Code Agentic AI Builders	Practitioners building autonomous AI agents and automated workflows — no coding required.

Certification Exam Domains

■ Domain 1:	Fundamentals of AI and Machine Learning
■ Domain 2:	Fundamentals of Generative AI
■ Domain 3:	Applications of Foundation Models
■ Domain 4:	Guidelines for Responsible AI
■ Domain 5:	Security, Compliance, and Governance for AI Solutions
■ Domain 6:	No-Code Agentic AI Development ★ NEW

Student Journey to AWS Certified AI Practitioner (AIF-C01)



Course Curriculum

SECTION 1 Introduction to AI, ML & Deep Learning

- Define Artificial Intelligence and contextualise its role in modern business and technology.
- Differentiate between Artificial Intelligence, Machine Learning, and Deep Learning.
- Understand the foundational principles of Neural Networks.
- Explore the applications of Computer Vision and Natural Language Processing (NLP).
- Identify value-adding AI use cases across industries.
- Recognise scenarios where AI is not the appropriate solution.

SECTION 2 Mastering the Basics: AI & ML Concepts

- Grasp fundamental AWS services and cloud computing core concepts.
- Learn the key stages of the Machine Learning process end-to-end.
- Identify and differentiate data types used in Machine Learning.
- Apply the main ML types: Supervised, Unsupervised, Reinforcement, and Semi-Supervised Learning.
- Understand the concept of Model Inference and its role in production systems.

SECTION 3 AWS AI Managed Services — Deep Dive

- Leverage Amazon Rekognition for image and video analysis.
- Utilise Amazon Transcribe for accurate speech-to-text conversion.
- Apply Amazon Translate for multilingual text translation at scale.
- Use Amazon Comprehend for natural language understanding and insight extraction.
- Build conversational interfaces with Amazon Lex.
- Generate lifelike speech output with Amazon Polly.
- Detect and mitigate fraud with Amazon Fraud Detector.
- Create personalised recommendation systems using Amazon Personalize.
- Implement intelligent enterprise search with Amazon Kendra.
- Extract structured data from documents using Amazon Textract.
- Apply time-series forecasting with Amazon Forecast.
- Orchestrate human-in-the-loop workflows with Amazon Augmented AI (A2I) and Amazon Mechanical Turk.

SECTION 4 Amazon SageMaker AI & the ML Development Lifecycle

- Gain a comprehensive overview of Amazon SageMaker AI and its core components.
- Understand the phases of the Machine Learning Development Lifecycle (MLDLC).
- Distinguish between the ML Development Lifecycle and an ML Pipeline.
- Grasp fundamental MLOps principles and practices.
- Map AWS SageMaker AI tools to the corresponding ML Pipeline stages.
- Evaluate classification and regression model performance using key technical metrics.

SECTION 5 Navigating Generative AI: Core Components, Model Types & Lifecycle

- Understand the architecture and significance of Foundation Models (FMs).
- Gain insight into Large Language Models (LLMs) and their capabilities.
- Explore tokens, embeddings, and vectors as fundamental building blocks.
- Examine the capabilities and applications of Multimodal Models.
- Understand the principles behind Diffusion Models for image generation.
- Navigate the Foundation Model Lifecycle from pre-training through deployment.

SECTION 6 Business Applications of Generative AI

- Identify high-impact business use cases for Generative AI across sectors.
- Evaluate the ROI and risk considerations of deploying Generative AI solutions.
- Understand how Generative AI augments human roles in knowledge work.
- Explore content generation, summarisation, Q&A, and code assistant applications.

SECTION 7 Your GenAI Toolkit: Essential AWS Services & Features

- Gain a comprehensive overview of Amazon Bedrock as a managed FM platform.
- Understand the purpose and capabilities of Amazon SageMaker JumpStart.
- Explore Amazon Q Business and Amazon Q Developer for enterprise GenAI applications.
- Understand key inference parameters: Temperature, Top-K, Top-P, and Output Length.
- Grasp Retrieval Augmented Generation (RAG) and its architectural role.
- Implement RAG and Knowledge Bases using Amazon Bedrock.
- Evaluate vector database options for storing and querying embeddings.

SECTION 8 Applications of Foundation Models: Key Design Considerations

- Understand Foundation Model customisation methods and their cost trade-offs.
- Learn how Amazon Bedrock Agents enable multi-step task orchestration.
- Design effective agentic architectures for complex, multi-turn workflows.
- Apply best practices for FM deployment, versioning, and lifecycle management.

SECTION 9 Prompt Engineering Essentials & AI Vulnerabilities

- Learn fundamental Prompt Engineering techniques and best practices.
- Apply advanced prompting strategies: zero-shot, few-shot, chain-of-thought, and role prompting.
- Identify and mitigate AI vulnerabilities including prompt injection, data poisoning, and model hijacking.
- Understand exposure risks and strategies to protect sensitive data in LLM interactions.

SECTION 10 Fine-Tuning Foundation Models — Deep Dive

- Discover various methods for fine-tuning Foundation Models to domain-specific tasks.
- Understand the critical steps involved in data preparation for effective fine-tuning.
- Explore instruction tuning, RLHF, LoRA, and parameter-efficient fine-tuning (PEFT) approaches.
- Evaluate cost, performance, and implementation considerations for each fine-tuning strategy.

SECTION 11 Evaluating Foundation Models: Methods & Metrics

- Understand key evaluation metrics: Perplexity, BLEU, ROUGE, BERTScore, Accuracy, and F1-Score.
- Apply human evaluation frameworks and automated benchmarking approaches.
- Design robust model evaluation pipelines for production readiness.

SECTION 12 Responsible AI Development: Key Concepts & Considerations

- Understand the core principles of Responsible AI: fairness, transparency, accountability, and privacy.
- Explore the legal and ethical concerns surrounding Generative AI, including copyright and consent.
- Understand Model Fit, Bias, and Variance — addressing underfitting and overfitting.
- Review AWS AI Service Cards and their role in communicating model capabilities and limitations.
- Apply AWS SageMaker Clarify to detect and mitigate bias in ML models.

SECTION 13 Making AI Understandable: Explainability & Transparency

- Understand explainability and interpretability in AI systems.
- Explore techniques for making black-box models more transparent to stakeholders.
- Learn how to communicate model decisions to both technical and non-technical audiences.

SECTION 14 Essential Security Practices & Tools on AWS

- Understand AI System Security within the AWS Shared Responsibility Model.
- Apply Identity and Access Management (IAM): Users, Groups, Roles, Policies, and Permissions.
- Explore AWS Encryption capabilities for securing data at rest and in transit.
- Address network security considerations for AI workloads, including AWS PrivateLink.

SECTION 15 Data Security & Governance for AI Systems

- Understand the concepts of data provenance, lineage, and classification for AI systems.
- Implement data quality controls and governance frameworks for ML datasets.
- Apply data anonymisation and privacy-preserving techniques for AI compliance.

SECTION 16 AI Security, Compliance & Governance

- Discover governance protocols and frameworks specifically designed for Generative AI.
- Understand compliance requirements for AI workloads across regulated industries.
- Apply audit, monitoring, and incident response strategies for AI systems on AWS.

SECTION 17 No-Code Agentic AI Development ★ NEW

- Understand Agentic AI principles: autonomous goal-setting, planning, and multi-step execution.
- Explore leading no-code platforms: Amazon Bedrock Agents, n8n, Zapier AI, and Make.com.
- Design and deploy AI agents integrating with CRM, email, calendars, and databases — no coding required.
- Build and test multi-agent workflows using visual drag-and-drop interfaces.
- Connect AI agents to external APIs, knowledge bases, and real-time data sources.
- Implement Human-in-the-Loop (HITL) controls and approval gates within agentic pipelines.
- Apply prompt-based agent configuration, memory management, and tool-calling patterns.
- Evaluate agent performance, reliability, and safety using no-code monitoring dashboards.
- Design responsible agentic systems with guardrails, escalation paths, and audit logs.
- Demonstrate practical use cases: research assistants, customer support agents, and automation bots.

SECTION 18 Practice Exam #1 & #2 + Exam Tips & Final Words

- Complete two full-length practice examinations mapped to the AIF-C01 exam blueprint.
- Review detailed explanations for every question to reinforce conceptual understanding.
- Apply evidence-based exam strategies and time management techniques.
- Identify knowledge gaps and targeted revision priorities before sitting the live exam.

Target Certification

AWS Certified AI Practitioner (AIF-C01) — Foundational Level