

**Developing Generative AI Applications on AWS**

**Course Number:** AWS-186
**Duration:** 2 days

**Overview**

This Generative AI on AWS training course introduces generative artificial intelligence (Gen AI) to software developers interested in using large language models (LLMs) without fine-tuning. Attendees learn Gen AI fundamentals, project planning best practices, and the functionalities of Amazon Bedrock. Additionally, the course covers prompt engineering, giving participants the skills to craft effective instructions for LLMs. By the end of this training, students will have mastered building generative AI applications on AWS using Amazon Bedrock and LangChain.

**Prerequisites**

We recommend that attendees of this course have:

* Completed AWS Technical Essentials
* Intermediate-level proficiency in Python

**Materials**

A modern web browser and an Internet connection free of restrictive firewalls, so that the student can connect by SSH or Remote Desktop (RDP) into AWS virtual machines.

**Software Needed on Each Student PC**

All Gen AI on AWS  training students will receive comprehensive courseware.

**Objectives**

* Understand the fundamentals of generative AI, its applications, and its potential impact across industries
* Identify and evaluate use cases where generative AI can drive innovation and efficiency within your organization
* Plan a generative AI project, from conceptualization to implementation, while mitigating risks and ensuring ethical practices
* Utilize Amazon Bedrock to access and experiment with powerful foundation models for various generative AI tasks
* Master prompt engineering techniques to effectively guide foundation models and optimize their output for specific needs
* Build generative AI applications using Amazon Bedrock's comprehensive toolset and leverage LangChain for enhanced capabilities
* Explore diverse architecture patterns to design and implement generative AI solutions for text summarization, question answering, chatbots, and code generation
* Secure generative AI applications and ensure responsible AI practices throughout the development and deployment process

**Outline**

* Introduction to Generative AI – Art of the Possible
	+ Overview of ML
	+ Basics of generative AI
	+ Generative AI use cases
	+ Generative AI in practice
	+ Risks and benefits
* Planning a Generative AI Project
	+ Generative AI fundamentals
	+ Generative AI in practice
	+ Generative AI context
	+ Steps in planning a generative AI project
	+ Risks and mitigation
* Getting Started with Amazon Bedrock
	+ Introduction to Amazon Bedrock
	+ Architecture and use cases
	+ How to use Amazon Bedrock
* Foundations of Prompt Engineering
	+ Basics of foundation models
	+ Fundamentals of prompt engineering
	+ Basic prompt techniques
	+ Advanced prompt techniques
	+ Model-specific prompt techniques
	+ Demonstration: Fine-tuning a basic text prompt
	+ Addressing prompt misuses
	+ Mitigating bias
	+ Demonstration: Image bias mitigation
* Amazon Bedrock Application Components
	+ Overview of generative AI application components
	+ Foundation models and the FM interface
	+ Working with datasets and embeddings
	+ Demonstration: Word embeddings
	+ Additional application components
	+ Retrieval Augmented Generation (RAG)
	+ Model fine-tuning
	+ Securing generative AI applications
	+ Generative AI application architecture
* Amazon Bedrock Foundation Models
	+ Introduction to Amazon Bedrock foundation models
	+ Using Amazon Bedrock FMs for inference
	+ Amazon Bedrock methods
	+ Data protection and auditability
* LangChain
	+ Optimizing LLM performance
	+ Using models with LangChain
	+ Constructing prompts
	+ Structuring documents with indexes
	+ Storing and retrieving data with memory
	+ Using chains to sequence components
	+ Managing external resources with LangChain agents
* Architecture Patterns
	+ Introduction to architecture patterns
	+ Text summarization
	+ Question answering
	+ Chatbot
	+ Code generation
	+ LangChain and agents for Amazon Bedrock