# Developing Generative AI Applications on AWS Training

Duration: **2 Day**

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The **Developing Generative AI Applications on AWS Training** course provides software developers with the knowledge and hands-on experience needed to design, build, and deploy modern **Generative AI** applications using AWS services and large language models.

Participants will learn how to leverage **Amazon Bedrock**, **LangChain**, and modern **Large Language Models (LLMs)** to create intelligent AI-powered applications. The course covers key concepts including **Prompt Engineering**, **Foundation Models**, **Retrieval-Augmented Generation (RAG)**, application security, architecture design, and best practices for building production-ready generative AI solutions.

Through practical labs and real-world use cases, learners will gain experience developing chatbots, text summarisation solutions, question-answering systems, code generation applications, and other enterprise AI workloads while applying AWS best practices for scalability, security, and performance.

## Prerequisites

Participants should have:

- Completed **AWS Technical Essentials**
- Intermediate proficiency in **Python**
- Familiarity with AWS services
- Basic understanding of cloud computing concepts

## Who Should Attend

This course is designed for:

- **Software Developers**
- **AI Application Developers**
- **Machine Learning Engineers**
- **Cloud Developers**
- **Full Stack Developers**
- **Data Engineers**
- Technical teams building generative AI applications
- Professionals interested in Amazon Bedrock and LangChain

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## What You Will Learn

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

- Explain the relationship between **Generative AI** and **Machine Learning**.
- Identify business opportunities for generative AI solutions.
- Assess and mitigate risks in AI projects.
- Build AI applications using **Amazon Bedrock**.
- Apply advanced **Prompt Engineering** techniques.
- Develop AI workflows with **LangChain**.
- Implement **Retrieval-Augmented Generation (RAG)** architectures.
- Design secure and scalable AI applications.
- Apply architecture patterns for a variety of AI use cases.

## Training Outline

### Day One

### Module 1: Introduction to Generative AI – The Art of the Possible

- Fundamentals of **Machine Learning**
- Introduction to **Generative AI**
- Understanding **Large Language Models (LLMs)**
- Generative AI Use Cases
- Business Opportunities and Value
- Risks and Benefits of Generative AI

### Module 2: Planning a Generative AI Project

- AI Project Lifecycle
- Requirements Analysis
- Risk Assessment
- Risk Mitigation Strategies
- AI Governance Considerations

### Module 3: Getting Started with Amazon Bedrock

- Introduction to **Amazon Bedrock**
- Foundation Models Overview
- Using Bedrock within AWS Console
- AI Service Integrations
- Hands-On Demonstration

### Module 4: Foundations of Prompt Engineering

- Introduction to **Prompt Engineering**
- Prompt Design Principles
- Advanced Prompt Techniques
- Prompt Security
- Preventing Prompt Misuse

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- Bias Mitigation Strategies

### Hands-On Exercise

- Prompt Optimisation
- Prompt Tuning
- Bias Mitigation Techniques

### Day Two

### Module 5: Amazon Bedrock Application Components

- Datasets
- Embeddings
- Vector Databases
- **Retrieval-Augmented Generation (RAG)**
- Application Security
- AI Data Management

### Module 6: Amazon Bedrock Foundation Models

- Bedrock Foundation Models
- Model Selection Strategies
- Foundation Model Use Cases

### Hands-On Lab

- **Zero-Shot Text Generation**
- Prompt-Based Content Generation

### Module 7: Building Generative AI Applications with LangChain

- **LangChain Architecture**
- AWS Integration
- LangChain Agents
- Prompt Templates
- Chat Models
- Document Loaders

### Hands-On Lab

- Building Applications with LangChain
- AI Workflow Design

### Module 8: Generative AI Architecture Patterns

- Enterprise AI Architectures
- Scalable AI Solutions
- Secure AI Design
- AWS-Based Generative AI Architectures

### Hands-On Scenarios

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- **AI Chatbot Development**
- **Text Summarisation**
- **Question Answering Systems**
- **Code Generation**
- End-to-End Application Development with Amazon Bedrock and LangChain