

Amazon Bedrock Agent, AgentCore, Guardrails & Knowledge Bases — Deep Dive

Proposed Duration : 2 Days (16 hours)

AgentCore Deep Dive

1. Introduction to Bedrock & AgentCore

- Overview, vision, and key use cases
- Core services: Runtime, Gateway, Memory, Observability

2. AgentCore Components

- Runtime and Gateway architecture
- Memory, Identity, and Observability layers
- Built-in tools: Code Interpreter and Browser Tool

3. Building Agents using AgentCore

- Supported frameworks and SDKs
- Development workflow and agent lifecycle
- Using Strands Agents with AgentCore
- Demonstration: Creating an agent in AWS Console

4. Integration & Configuration

- Connecting AgentCore with Bedrock Agents
- Tool and memory integration
- Testing and debugging using Observability

5. Deployment and Operations

- Security and VPC integration
- Monitoring and scaling considerations
- Versioning, rollout, and CI/CD best practices

6. Use Cases and Best Practices

- Real-world examples and deployment patterns
- Best practices for agent performance and reliability

7. Lab / Demo 1: AgentCore Deep Dive Workshop

- Deploy and invoke a sample agent
 - Integrate runtime, memory, and observability
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Guardrails & Knowledge Bases

1. Introduction to Guardrails

- Purpose and importance of responsible AI
- Integration with AgentCore and Knowledge Bases

2. Guardrail Capabilities

- Content filters and denied topics
- Sensitive data and PII filters
- Grounding checks and automated reasoning

3. Configuring Guardrails

- Creating and managing Guardrails
- Associating Guardrails with agents
- Testing, iteration, and optimization

4. Lab / Demo 2: Guardrails in Action

- Build and test a guardrail
- Compare results with and without Guardrails

5. Introduction to Knowledge Bases

- Overview and role in retrieval-augmented generation (RAG)
- Integration with Guardrails and AgentCore

6. Building and Querying a Knowledge Base

- Creating a Knowledge Base and configuring data sources
- Generating embeddings and vector stores
- Retrieval and response generation workflow

7. Lab / Demo 3: Knowledge Base + Guardrails Integration

- Build a Knowledge Base
- Apply Guardrails

- Test retrieval and response refinement

8. Putting It All Together

- End-to-end workflow: user query → agent → knowledge base → guardrails → model response
- Observability and best practices for production

Agentic AI Foundations

AWS Classroom Training

Course description

In this course, you'll explore the core principles and strategies for designing Agentic AI systems using AWS services. You'll learn how Agentic AI differs from traditional conversational systems, and how to use tools like Amazon Q, Kiro, Amazon Bedrock Agents, and Amazon Bedrock AgentCore to build autonomous, goal-driven solutions that solve real-world problems.

- Course level: Fundamental
- Duration: 1 day

Activities

This course includes presentations, hands-on lab, and group exercises.

Course objectives

In this course, you will learn to:

- Summarize the evolution of Agentic AI and define what makes something "agentic"
- Identify core components of agentic systems
- Distinguish between workflow, autonomous, and hybrid agents
- Compare AWS service options for Agentic AI
- Describe capabilities and use cases of Amazon Q Developer, Amazon Q Business, and Kiro
- Explain Amazon Bedrock AgentCore and Amazon Bedrock Agents fundamentals
- Identify basic implementation patterns for Agentic AI
- Describe observability and interoperability patterns for production agentic AI systems

Intended audience

This course is intended for:

- Software developers new to Agentic AI seeking foundational knowledge
- Technical professionals exploring AI capabilities and interested in core components and applications of agentic AI
- Development teams evaluating Agentic AI solutions and needing to differentiate between agent types
- AWS Users expanding into Agentic AI, including current users of Amazon Q Developer, Amazon Q Business, and Amazon Bedrock Agents

Prerequisites

We recommend that attendees of this course have:

- Generative AI Essentials or equivalent work experience
- Basic AWS knowledge and software development experience

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Course outline

Day 1

Module 1: From LLMs to Agents

- Understanding Large Language Models (LLMs)
- Innovations powering agents
- Evolution timeline from LLMs to Agents

Module 2: Exploring Agentic AI

- Understanding Agentic AI
- Types of AI agents
- Agentic AI applications

Module 3: Understanding Agentic AI Workflows

- Workflow patterns
- Amazon Bedrock flows overview

Module 4: Introducing Autonomous Agents

- How Autonomous Agents work
- ReAct
- ReWoo
- Multi-agent collaboration
- AWS Agentic AI solutions

Module 5: Amazon Q and Agentic Development Tools

- Amazon Q Developer
- Amazon Q Business
- Amazon Q in AWS Services
- Kiro: AI-powered IDE with spec-driven development

Module 6: Agentic AI with Amazon Bedrock

- Amazon Bedrock Agents
- Amazon Bedrock AgentCore
- Hands-on lab: Explore Amazon Bedrock Agents integrated with Amazon Bedrock Knowledge Bases and Amazon Bedrock Guardrails

Module 7: Building DIY Solutions

- DIY solutions
- Observability and Monitoring
- Agent Interoperability

Module 8: Course Wrap-up

- Next steps and additional resources
- Course summary