Training: AWS
Advanced Generative AI Development on AWS

TRAINING GOALS:

The Advanced Generative AI Development on AWS is designed for developers seeking to master the implementation of production-ready generative AI solutions on AWS. The course addresses the needs of organizations embarking on their generative AI journey and how to build comprehensive generative AI strategies that align with broader business objectives.

This advanced 3-day instructor-led training builds expertise across the entire generative AI stack - from foundation models to enterprise integration patterns. In addition, you will learn about advanced data processing techniques, vector database implementation and retrieval augmentation, sophisticated prompt engineering and governance, agentic AI systems and tool integration, AI safety and security measures, performance optimization and cost management strategies, comprehensive monitoring and observability solutions, testing and validation frameworks.

The course structure follows AWS's proven model for generative AI adoption, progressing from experimentation to production-ready implementations.

Course objectives

In this course, you will learn to:

- Develop production-ready generative AI solutions using AWS services that meet enterprise requirements for security, scalability, and reliability
- Evaluate and select appropriate foundation models for specific business use cases, including benchmarking performance and implementing dynamic model selection architectures
- Design and implement resilient foundation model systems with circuit breakers, cross-region deployment, and graceful degradation strategies
- Build comprehensive data processing pipelines for multi-modal inputs, including validation workflows and optimization techniques
- Implement sophisticated vector database solutions using Amazon Bedrock Knowledge
- Bases, OpenSearch, and hybrid approaches for effective retrieval augmentation
- Create and manage advanced prompt engineering frameworks, including chain-of-thought reasoning and enterprise-wide prompt governance systems

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- Develop autonomous AI agents using Amazon Bedrock Agents, implementing complex reasoning patterns and tool integration capabilities
- Implement comprehensive AI safety and security controls, including content filtering, privacy preservation, and adversarial testing mechanisms
- Optimize performance and manage costs through token efficiency strategies, batching implementations, and intelligent caching systems
- Design and implement comprehensive monitoring and observability solutions for foundation model applications
- Create systematic testing and validation frameworks for continuous quality assurance of AI applications
- Integrate generative AI solutions within enterprise environments using secure, compliant, and scalable architectural patterns

Intended audience

This course is intended for those with:

- Software developers
- Technical Professionals

CONSPECT:

- Module 1: Foundation Model Selection and Configuration
  - Enterprise foundation model evaluation framework
  - Dynamic model selection architecture patterns
  - Resilient foundation model system designs
  - Cost optimization and economic modeling
- Module 2: Advanced Data Processing for Foundation Models
  - Comprehensive data validation and quality assurance
  - Multi-modal data processing pipelines
  - Input optimization and performance enhancement
- Module 3: Vector Databases and Retrieval Augmentation
  - Enterprise vector database architecture
  - Advanced document processing and chunking strategies
  - Sophisticated retrieval system implementation
  - Hands-on Lab: Develop Retrieval Augmented Generation (RAG) Applications with Amazon Bedrock Knowledge Bases

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- Module 4: Prompt Engineering and Governance
  - Advanced prompt engineering frameworks
  - Complex prompt orchestration systems
  - Enterprise prompt governance and management
  - Hands-on Lab: Develop conversation pattern with Amazon Bedrock APIs
- Module 5: Agentic AI and Tool Integration
  - Agentic AI architecture and evolution
  - Amazon Bedrock Agents implementation
  - AWS Agentic AI service ecosystem
  - Tool integration and production observability
- Module 6: AI Safety and Security
  - Comprehensive content safety implementation
  - Privacy-preserving AI architecture
  - AI governance and compliance frameworks
- Module 7: Performance Optimization and Cost Management
  - Token efficiency and cost optimization
  - High-performance system architecture
  - Intelligent caching systems implementation
  - Hands-on Lab: Building Secure and Responsible Gen AI with Guardrails for Amazon Bedrock
- Module 8: Monitoring and Observability for Generative AI
  - Foundation model monitoring systems
  - Business impact and value management
  - AI-specific troubleshooting and diagnostics
- Module 9: Testing, Validation, and Continuous Improvement
  - Comprehensive AI evaluation frameworks
  - Quality assurance and continuous improvement
  - RAG system evaluation and optimization
- Module 10: Enterprise Integration Patterns
  - Enterprise connectivity and integration architecture
  - Secure access and identity management
  - Cross-environment and hybrid deployments
- Module 11: Course wrap-up
  - Next steps and additional resources
  - Course summary

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REQUIREMENTS:

We recommend that attendees of this course have:

- AWS Technical Essentials
- Generative AI Essentials on AWS
- 2 or more years of experience building production grade applications on AWS or with opensource technologies, general AI/ML or data engineering experience
- 1 year of hands-on experience implementing generative AI solutions

Difficulty level

CERTIFICATE:

The participants will obtain certificates signed by AWS (course completion).

TRAINER:

AWS Authorized Instructor (AAI)

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