

Databricks Mosaic AI

COURSE CONTENT

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About Multisoft

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About Course

Databricks Mosaic AI Training provides practical exposure to creating and managing enterprise generative AI solutions on the Databricks platform. The course covers foundation models, prompt engineering, vector search, RAG, AI agents, model serving, evaluation, monitoring, and AI governance. Through instructor-led sessions and practical scenarios, participants gain an understanding of end-to-end Mosaic AI workflows for modern enterprise applications.

Module 1: Introduction to Databricks Mosaic AI

- ✓ Overview of Databricks Data Intelligence Platform
- ✓ Introduction to Mosaic AI
- ✓ Mosaic AI ecosystem and capabilities
- ✓ Generative AI and machine learning use cases
- ✓ Understanding the AI application lifecycle
- ✓ Foundation models and enterprise AI
- ✓ Mosaic AI development architecture
- ✓ Common enterprise implementation scenarios

Module 2: Databricks Lakehouse and AI Environment

- ✓ Lakehouse architecture fundamentals
- ✓ Databricks workspace overview
- ✓ Compute resources for AI workloads
- ✓ Notebooks and development environments
- ✓ Working with data for AI applications
- ✓ Delta Lake fundamentals
- ✓ Unity Catalog overview
- ✓ Data preparation for machine learning
- ✓ Managing AI development assets

Module 3: Mosaic AI Tools, Workspace, and Development Workflow

- ✓ Mosaic AI development components

- ✓ AI application development workflow
- ✓ Working with notebooks and repositories
- ✓ Model development environments
- ✓ Managing experiments and artifacts
- ✓ Connecting data with AI workloads
- ✓ Development-to-production workflow
- ✓ Collaborative AI development practices

Module 4: Machine Learning Development with Mosaic AI

- ✓ Machine learning workflow in Databricks
- ✓ Preparing training datasets
- ✓ Feature engineering concepts
- ✓ Model training workflows
- ✓ Training and validation datasets
- ✓ Model performance metrics
- ✓ Hyperparameter experimentation
- ✓ Comparing model performance
- ✓ Managing machine learning experiments
- ✓ Reproducible ML workflows

Module 5: MLflow for Experiment Tracking and Model Management

- ✓ Introduction to MLflow
- ✓ MLflow tracking concepts

- ✓ Logging parameters and metrics
- ✓ Tracking model artifacts
- ✓ Comparing experiment runs
- ✓ Model packaging
- ✓ Model registration concepts
- ✓ Managing model versions
- ✓ Model lifecycle workflows
- ✓ MLflow integration with Mosaic AI
- ✓ Production model management considerations

Module 6: Foundation Models and Large Language Models

- ✓ Introduction to foundation models
- ✓ Understanding Large Language Models
- ✓ Transformer and token concepts
- ✓ Foundation Model APIs
- ✓ Selecting models for AI applications
- ✓ Open and proprietary model considerations
- ✓ Context windows and token management
- ✓ Model parameters and inference settings
- ✓ Working with pretrained models
- ✓ Enterprise LLM use cases
- ✓ Cost, latency, and performance considerations

Module 7: Prompt Engineering and LLM Application Development

- ✓ Prompt engineering fundamentals
- ✓ System and user prompts
- ✓ Prompt templates
- ✓ Zero-shot and few-shot prompting
- ✓ Context management
- ✓ Structured prompting techniques
- ✓ Controlling model responses
- ✓ Prompt iteration and testing
- ✓ Managing prompt variables
- ✓ Structured output generation
- ✓ Handling hallucinations and irrelevant responses
- ✓ Designing prompts for enterprise applications

Module 8: Mosaic AI Model Serving

- ✓ Introduction to model serving
- ✓ Serving machine learning and generative AI models
- ✓ Creating model serving endpoints
- ✓ Endpoint configuration
- ✓ Querying serving endpoints
- ✓ Real-time model inference
- ✓ Foundation model endpoints
- ✓ Custom model serving
- ✓ Endpoint authentication and access

- ✓ Performance and scaling considerations
- ✓ Monitoring model endpoints
- ✓ Managing production inference workloads

Module 9: Vector Search and Embedding-Based Applications

- ✓ Understanding embeddings
- ✓ Vector representation of enterprise data
- ✓ Semantic search concepts
- ✓ Introduction to Mosaic AI Vector Search
- ✓ Vector indexes
- ✓ Preparing source data
- ✓ Generating embeddings
- ✓ Creating and managing vector search indexes
- ✓ Similarity search
- ✓ Metadata filtering
- ✓ Querying vector indexes
- ✓ Integrating Vector Search with LLM applications
- ✓ Vector search performance considerations

Module 10: Retrieval-Augmented Generation (RAG)

- ✓ Introduction to RAG architecture
- ✓ Limitations of standalone LLMs
- ✓ RAG application workflow

- ✓ Document ingestion
- ✓ Data preprocessing
- ✓ Document chunking strategies
- ✓ Embedding generation
- ✓ Vector indexing
- ✓ Retrieval techniques
- ✓ Context construction
- ✓ Combining retrieved data with prompts
- ✓ LLM response generation
- ✓ Improving retrieval relevance
- ✓ RAG evaluation
- ✓ Handling enterprise knowledge sources
- ✓ Building an end-to-end RAG application

Module 11: Mosaic AI Agent Framework and Agentic AI

- ✓ Introduction to AI agents
- ✓ Understanding agentic AI workflows
- ✓ Mosaic AI Agent Framework concepts
- ✓ Components of an AI agent
- ✓ LLM reasoning and tool usage
- ✓ Connecting agents to enterprise data
- ✓ Retrieval within agent workflows
- ✓ Tool and function integration
- ✓ Designing multi-step AI workflows
- ✓ Managing agent context
- ✓ Agent responses and structured outputs

- ✓ Building knowledge-based agents
- ✓ Testing agent behavior
- ✓ Agent deployment considerations

Module 12: AI Application Evaluation, Quality, and Monitoring

- ✓ Importance of GenAI evaluation
- ✓ AI quality dimensions
- ✓ Evaluating LLM responses
- ✓ Response correctness and relevance
- ✓ Groundedness concepts
- ✓ Retrieval quality assessment
- ✓ Evaluation datasets
- ✓ Automated evaluation workflows
- ✓ Human evaluation considerations
- ✓ Comparing application versions
- ✓ Identifying hallucinations
- ✓ Tracking AI application quality
- ✓ Production monitoring concepts
- ✓ Continuous improvement of GenAI applications

Module 13: Fine-Tuning and Custom Model Development

- ✓ Understanding model customization
- ✓ Prompt engineering vs. fine-tuning

- ✓ Preparing training datasets
- ✓ Data quality considerations
- ✓ Fine-tuning concepts
- ✓ Model training workflow
- ✓ Evaluating customized models
- ✓ Comparing base and customized models
- ✓ Model registration and management
- ✓ Serving customized models
- ✓ Performance and cost considerations
- ✓ Selecting the appropriate customization strategy

Module 14: AI Governance, Security, and Production Operations

- ✓ Enterprise AI governance concepts
- ✓ Unity Catalog for AI governance
- ✓ Access control and permissions
- ✓ Managing models and AI assets
- ✓ Data governance for AI workloads
- ✓ Model lineage concepts
- ✓ Securing AI applications
- ✓ Protecting enterprise information
- ✓ Responsible AI considerations
- ✓ Managing production endpoints
- ✓ Monitoring AI workloads
- ✓ Cost and resource optimization

- ✓ Production lifecycle management
- ✓ Operational best practices

Module 15: End-to-End Mosaic AI Project and Enterprise Use Cases

- ✓ Defining an enterprise AI use case
- ✓ Preparing organizational data
- ✓ Selecting a foundation model
- ✓ Designing the application architecture
- ✓ Creating embeddings
- ✓ Configuring Vector Search
- ✓ Building a RAG pipeline
- ✓ Prompt development and optimization
- ✓ Integrating AI agents where applicable
- ✓ Evaluating application responses
- ✓ Deploying through model serving
- ✓ Monitoring application performance
- ✓ Applying governance and security controls
- ✓ Troubleshooting common implementation issues
- ✓ End-to-end project review
- ✓ Enterprise implementation considerations