

Advanced Generative AI Workflow Automation Training Course

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Overview

Advanced Generative AI Workflow Automation Training Course is a two-week technical course for enterprise architects, data engineers, and automation leads who need a Production AI Orchestration Package. Organizations struggle to move generative models from isolated prototypes into governed, multi-agent enterprise workflows that meet data protection and quality requirements. Participants configure production pipelines using agentic frameworks, retrieval-augmented generation architectures, and standardized risk controls across cloud and local environments. Agile Leaders Training Center delivers this advanced generative AI workflow automation training course.

Who Should Attend

- Engineers responsible for building multi-agent workflows and API pipelines
- Data professionals managing vector databases and retrieval-augmented indexing
- Solutions architects overseeing enterprise generative model integrations
- Technology leads governing artificial intelligence management systems and controls
- Automation developers connecting language models to operational databases

The course assumes participants possess working familiarity with Python programming and REST APIs; model fine-tuning and hardware infrastructure provisioning remain outside the course.

Departments and Industries

The course supports cross-functional enterprise automation across corporate divisions and regulated industries.

- Enterprise data science and analytics
- Digital automation and operational technology
- Banking and financial services technology
- Healthcare informatics and clinical data systems
- Supply chain systems and logistics planning

Learning Objectives

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

- Apply ISO/IEC 42001:2023 management controls across multi-agent generative systems
- Build production retrieval-augmented generation pipelines using vector database indexing
- Design multi-step agent orchestration flows using LangGraph and CrewAI frameworks
- Evaluate automated decision boundaries against ISO/IEC 23894:2023 risk guidance
- Analyze output reliability using automated evaluation metrics and trace telemetry
- Assemble a Production AI Orchestration Package containing deployment and governance records

Course Agenda

Day 1: AI Management Systems and Lifecycle Scope

- ISO/IEC 42001:2023 Clause 4 to 10 AIMS Requirement Matrix
- ISO/IEC 22989:2022 Lifecycle Boundary and Terminology Register
- Enterprise Generative Automation System Architecture Blueprint
- Data Privacy Impact Assessment Specification for Algorithmic Workflows
- Local and Cloud Foundation Model Deployment Boundary Log

Day 2: Prompt Pipelines and API Structured Outputs

- Structured JSON Schema Output Enforcement Specifications
- Few-Shot Prompt Template Registry and Parameter Configuration
- Model Gateway Architecture and Token Consumption Budget Plan
- Deterministic Guardrail Configuration and Output Validation Rules
- API Error Handling and Fallback Strategy Routing Matrix

Day 3: Vector Databases and Advanced Retrieval Architecture

- Document Chunking and Semantic Embedding Selection Guide
- Vector Database Indexing and Hybrid Search Configuration
- Retrieval-Augmented Generation Query Rewriting Pipeline
- Context Window Management and Metadata Filtering Matrix
- Knowledge Retrieval Latency and Throughput Benchmark Log

Day 4: Agentic Reasoning and Tool Integration

- LangChain and LangGraph Agent State Machine Definitions
- Function Calling and External REST API Connector Protocols
- CrewAI Multi-Agent Task Delegation and Role Specifications
- Agent Execution Memory and Scratchpad Persistence Protocols
- Model Context Protocol Integration and Tool Registry Map

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Day 5: Workflow Automation Orchestration Platforms

- n8n Self-Hosted Enterprise Automation Workflow Canvas
- Make.com Webhook Integration and Web Service Orchestrator
- Asynchronous Event-Driven Pipeline and Queue Configuration
- Database Read-Write Transaction Verification Checkpoints
- Enterprise Workflow Authentication and Secret Management Plan

Day 6: Human-in-the-Loop Controls and Governance

- ISO/IEC 23894:2023 AI Risk Assessment and Treatment Log
- Human-in-the-Loop Review Trigger and Intervention Thresholds
- Sensitive Information Redaction and De-Identification Filters
- Critical Decision Escalation Paths and Approval Audit Trails
- Data Breach Notification Protocols and Incident Log Templates

Day 7: AgentOps, Observability, and Telemetry

- OpenTelemetry Instrumentation and LLM Trace Pipeline Design
- Latency, Cost, and Error Metric Dashboard Configuration
- Hallucination Detection and Groundedness Evaluation Benchmarks
- Automated Model Regression Testing Suite Structure
- Operational Runbook and Service Level Objective Baseline

Day 8: Security, Access, and System Hardening

- Prompt Injection and Jailbreak Defense Verification Protocol
- Role-Based Access Control Matrix for Vector Indices and Tools
- Data Residency and In-Transit Encryption Verification Checklist
- Third-Party Model Vendor Security and Processing Evaluation
- Adversarial Input Simulation and Pipeline Hardening Guide

Day 9: Cross-Functional Workflow Integration

- Financial Document Analysis and Reconciliation Automation Flow
- Clinical Records Information Extraction and Verification Pipeline
- Supply Chain Demand Disruption Reasoning and Dispatch Flow
- Enterprise Resource Planning Webhook Data Ingestion Route
- Continuous Monitoring and Drift Mitigation Action Plan

Day 10: Governed Production Orchestration Practice

- Exercise: Multi-Agent Pipeline Setup and State Validation
- Exercise: Retrieval-Augmented Generation Accuracy and Latency Audit
- Exercise: Human Intervention Threshold and Incident Response Test
- Exercise: Telemetry Logging and Security Vulnerability Scan
- Capstone Exercise: Production AI Orchestration Package

Practical Exercises

Suggested activities structure technical methods into controlled production records.

- Suggested activity: assemble an agent orchestration pipeline connecting enterprise APIs with structured validation controls
- Suggested activity: implement retrieval-augmented generation search indexing with data privacy filtering rules
- Suggested activity: run automated regression benchmarks measuring groundedness, latency, and token consumption
- Suggested activity: compile a complete Production AI Orchestration Package

FAQs

Who should attend and what does the course assume?

The course suits engineers, data specialists, and enterprise architects implementing automated language model systems. It assumes prior working experience with Python and REST APIs while excluding hardware provisioning.

How does this course differ from introductory prompt engineering training?

It focuses on multi-agent architectures, retrieval-augmented systems, observability, and ISO/IEC 42001:2023 governance, rather than individual text prompting or workplace office summaries.

What data governance standards does this advanced generative AI workflow automation course address?

The course aligns multi-agent workflows with ISO/IEC 42001:2023 requirements, ISO/IEC 23894:2023 risk guidelines, and strict data privacy impact assessments for automated pipelines.

What will participants take back to work?

Participants take back a Production AI Orchestration Package containing architecture blueprints, vector indexing parameters, telemetry configurations, and risk treatment documentation.

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Conclusion

Participants return with a fully documented Production AI Orchestration Package that establishes reliable multi-agent systems across corporate environments. The methodology integrates international governance standards directly into production pipelines to prevent uncontrolled outputs and data exposures. This transition enables organizations to deploy automated generative workflows with defined human oversight and measurable operational performance.

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