

TuxAcademy AI Agent & Automation Engineering Program



Build Production-Ready AI Agents, Intelligent Workflows, and Enterprise AI Applications

Course Objective

This program takes learners from Python fundamentals to building production-ready AI agents, retrieval-augmented generation (RAG) applications, AI-powered automation workflows, and enterprise AI solutions.

Module 1: Python for AI

- Python fundamentals
- Functions and modules
- Object-Oriented Programming
- Virtual environments and package management

Module 2: LLM Fundamentals

- How LLMs work
- Tokens and embeddings
- Context windows
- Prompt engineering

Module 3: Working with AI APIs

- OpenAI, Anthropic, Gemini APIs
- Streaming responses
- Structured outputs
- Tool/function calling

Module 4: Retrieval-Augmented Generation (RAG)

- Embeddings
- Vector databases
- Retrieval pipelines
- Knowledge-grounded assistants

Module 5: AI Agents

- Planning and reasoning
- Agent architecture
- Memory
- Tool usage
- Agent design patterns

Module 6: MCP & Tool Integration

- Model Context Protocol (MCP)
- Custom tools
- External system integrations

Module 7: Multi-Agent Systems

- Agent orchestration
- CrewAI/LangGraph concepts
- Collaborative agent workflows

Module 8: AI Automation

- Workflow automation
- Webhooks and REST APIs
- Google Workspace & Microsoft 365 integrations
- CRM and database automation
- Email and document automation
- n8n, Make, Zapier overview
- Human-in-the-loop workflows

Module 9: Production AI

- Deployment
- Testing
- Observability
- Security
- Performance and cost optimization

Module 10: Capstone Projects

- Enterprise chatbot
- Research assistant
- Customer support agent
- AI workflow automation project

