



AGENTIC AI TRAINING PROGRAM

DURATION: 6–8 WEEKS (DEPENDING ON DELIVERY PACE) 36 HOURS
MODE: INSTRUCTOR-LED / HYBRID / SELF-PACED INCLUDES: 2
CAPSTONE PROJECTS + 6–8 HANDS-ON ASSIGNMENTS



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MODULES

Module 1: Introduction to Agentic AI (3 hours) □ Understanding Intelligent Agents and Multi-Agent Systems □ Evolution from Generative AI to Agentic AI □ Differences between LLMs, Autonomous Agents, and Cognitive Systems □ Overview of current Agentic AI tools (LangChain, CrewAI, AutoGen, MetaGPT, etc.) □ Industry applications and case studies Assignment 1: Write a concept note on how Agentic AI differs from traditional AI pipelines.

Module 2: Foundations of Large Language Models (5 hours) □ How LLMs work: Tokenization, embeddings, and prompt engineering □ Fine-tuning vs. instruction-tuning □ LLM evaluation and hallucination management □ Tools overview: OpenAI API, Hugging Face, Ollama, and local LLMs Assignment 2: Build a small prompt-driven chatbot using OpenAI or Hugging Face.

Module 3: Agentic AI Architecture (6 hours) □ Core components of agentic systems: o Memory o Planning o Reasoning o Tool use o Environment interaction □ Agent loop: Perception → Thought → Action → Reflection □ Framework overview: LangChain Agents, AutoGen, CrewAI, SmolAgents Hands-on Lab: Implement a simple autonomous agent using LangChain or AutoGen.

Module 4: Agent Planning and Coordination (5 hours) □ Task decomposition and self-reflection loops □ Multi-agent collaboration and role definition □ Workflow orchestration (CrewAI, HuggingGPT, ChatDev) □ Knowledge graph integration and reasoning Assignment 3: Implement a two-agent collaboration scenario (e.g., Researcher + Coder).

Module 5: Tool Use and Integration (5 hours) □ API calling and tool delegation □ Connecting to external systems (databases, APIs, search tools) □ Using embeddings for retrieval (RAG-based agents) □ Integration with corporate data and knowledge bases Assignment 4: Build a “Research Assistant Agent” that uses web search + summarization tools.

Module 6: Memory and Learning in Agents (4 hours) □ Short-term, long-term, and episodic memory in agents □ Vector databases (FAISS, Chroma, Pinecone) □ Persistent memory design and knowledge retention □ Learning from feedback (self-improvement mechanisms)
Assignment 5: Implement a memory-augmented agent using FAISS or Chroma.

Module 7: Governance, Safety, and Ethics (3 hours) □ Guardrails and constraints in autonomous systems □ Ethical considerations and bias prevention
□ Human-in-the-loop mechanisms □ Secure deployment best practices
Assignment 6: Add human-approval steps to an autonomous workflow.

Module 8: Agent Deployment and MLOps (4 hours) □ Packaging agents with containers (Docker) □ Orchestration with Airflow or LangGraph □ Observability and monitoring of agentic workflows □ Version control, testing, and CI/CD for agents
Hands-on Lab: Deploy a LangChain or AutoGen agent to a cloud environment.

Module 9: Domain Applications of Agentic AI (4 hours) □ Business process automation □ AI in software development (code agents, test automation) □ AI in customer experience (service bots, personalized advisors) □ Research and analytics assistants
Assignment 7: Design a domain-specific use case proposal.

Module 10: Capstone Projects (6–8 hours total)
Project 1: Autonomous Research Assistant □ Agents: Researcher + Summarizer + Planner □ Task: Automatically research a topic, extract key insights, and generate a report. □ Tools: LangChain / CrewAI + OpenAI API + Vector DB
Project 2: Multi-Agent Workflow for Business Automation □ Agents: Planner + Data Analyst + Report Generator □ Task: Analyze simulated company data, generate insights, and email a formatted report. □ Tools: AutoGen / LangGraph + Microsoft Fabric or Databricks

Module 11: Future of Agentic AI (2 hours) □ Cognitive architectures (ACT-R, Soar, Adaptive Agents) □ Agentic AI + Robotics □ Emerging research: Self-evolving systems and synthetic cognition □ Industry trends & future skills



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