Course Design – “Agent Building for Developers”

Course Overview

“Agent Building for Developers” is a 4-week immersive course designed to help developers understand, build, and deploy intelligent AI agents using **Lyzr AI’s framework** and open-source tools. The program focuses on practical implementation while grounding learners in agentic reasoning, tool integration, and deployment best practices.

By the end of the course, participants will have built a **fully functional AI agent** capable of reasoning, using tools, and interacting with real-world systems.

Duration: 4 Weeks
Format: Blended learning (video lessons, labs, projects)
Level: Intermediate (Python developers and AI enthusiasts)

Learner Profile & Prerequisites

Ideal Learners:

- Python developers, ML enthusiasts, or backend engineers curious about LLM-powered automation.
- Developers aiming to integrate AI agents into products or workflows.

Prerequisites:

- Intermediate Python programming
- Basic understanding of APIs and JSON
- Familiarity with LLMs or NLP concepts (optional but helpful)

Learning Objectives

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

1. Understand the **architecture** and **workflow** of AI agents.
2. Build custom agents using **Lyzr AI SDK** and LLM APIs.
3. Implement **reasoning loops, memory**, and **tool usage**.
4. Integrate agents with external APIs and databases.
5. Deploy and optimize production-ready agents.

Teaching Approach

The course follows a **“Learn – Build – Reflect”** methodology designed for active developer engagement:

- **Learn:** Short, concept-driven lessons combining explanations and real-world analogies.
- **Build:** Guided hands-on coding sessions and lab notebooks that reinforce concepts through implementation.
- **Reflect:** Weekly quizzes, coding reflections, and peer discussion threads to internalise learning.

Each week concludes with a **mini-project** to apply newly learned skills.

4-Week Course Structure

Week 1: Foundations of Agentic AI

Theme: Understanding the Agent Mindset
Topics:

- What are AI Agents? How they differ from chatbots
- Components of an agent: LLM, reasoning, memory, tools
- Introduction to the Lyzr AI SDK
- Setting up environment and API keys

Day	Focus	Activity	Expected Outcome
Day 1	*What are AI Agents?*	Instructor video: "Agents vs Chatbots" + short quiz	Learners differentiate agents from chatbots and traditional LLM apps
Day 2	*Core Components of Agents*	Whiteboard session explaining LLM, tools, memory, reasoning	Understand internal architecture of an agent
Day 3	*Lyzr SDK Setup*	Guided installation tutorial (API setup, environment)	Lyzr SDK successfully configured and tested
Day 4	*Hello World Agent*	Code-along session: "Build a simple chat agent"	Able to create and test a basic conversational agent
Day 5	*Mini Project: Task Reminder Bot*	Implement save & retrieve reminders via simple storage	Learners demonstrate persistence and interaction

Hands-on Lab:
Build a simple conversational "Hello World" agent using Lyzr SDK.

Mini Project:
Create a "Task Reminder Bot" that saves and retrieves user reminders.

Learning Outcomes:

- Explain the structure of agent systems
- Set up Lyzr SDK for development
- Build and test a basic conversational agent

Week 2: Building Functional Agents

Theme: From Prompts to Dynamic Behaviours
Topics:

- Prompt templates and chaining
- Context management
- Tool use and function calling
- Introduction to retrieval-augmented generation (RAG)

Day	Focus	Activity	Expected Outcome
Day 1	*Prompt Templates & Chaining*	Demo: prompt structuring using Lyzr SDK	Learners design reusable prompt templates
Day 2	*Context Management*	Notebook exercise: manage dialogue state and variables	Understand how context affects agent replies
Day 3	*Tool Use & Function Calling*	Code-along: integrate public API (weather/news)	Able to make agents call external APIs
Day 4	*Retrieval-Augmented Generation (RAG)*	Lab: connect a vector database for PDF Q&A	Implement document search with embeddings
Day 5	*Mini Project: API-Enabled Assistant*	Build an assistant that fetches real-time info from APIs	Create and test a multi-tool agent

Hands-on Lab:
Build a "Document Q&A Agent" that reads PDFs and answers questions using vector stores.

Mini Project:
Integrate a public API (e.g., weather, news, or stock) as a tool.

Learning Outcomes:

- Implement tool-calling in agents
- Use embeddings and retrieval to enhance context
- Extend agent capabilities via external APIs

Week 3: Reasoning, Memory & Multi-Agent Collaboration

Theme: Making Agents Smarter and Collaborative
Topics:

- The ReAct pattern (Reason + Act)
- Short-term vs. Long-term memory
- Planner–Executor multi-agent architecture
- Error handling and fallback mechanisms

Day	Focus	Activity	Expected Outcome
Day 1	*The ReAct Pattern*	Visual explainer: Reason → Act → Observe → Repeat	Understand reasoning loops and ReAct flow
Day 2	*Implementing ReAct*	Code-along: reasoning + tool use loop with print traces	See reasoning in action via thought logs
Day 3	*Short-term vs Long-term Memory*	Lab: add memory persistence using Chroma	Agents retain user context across turns
Day 4	*Planner–Executor Architecture*	Build 2 agents: planner (decides) & executor (acts)	Learn multi-agent collaboration workflow
Day 5	*Mini Project: Research Assistant*	Create a multi-agent system for topic research	Integrate reasoning + memory + tool use

Hands-on Lab:
Develop a “Research Assistant” composed of a planner agent and an executor agent.

Mini Project:
Document the reasoning chain and memory flow using a diagram or JSON trace.

Learning Outcomes:

- Explain how the ReAct loop powers reasoning
- Implement a memory-augmented agent
- Build simple multi-agent collaboration flows

Week 4: Deployment & Real-World Applications

Theme: From Prototype to Production
Topics:

- Frontend integration (Streamlit / Gradio)
- Deploying Lyzr-based agents to cloud environments
- Monitoring and performance optimisation
- Ethical considerations and safe deployment

Day	Focus	Activity	Expected Outcome
Day 1	*Frontend Integration*	Demo: Streamlit/Gradio UI for AI agents	Learners can connect agents to web front-ends
Day 2	*Cloud Deployment*	Walkthrough: deploy agent to Streamlit Cloud	Successfully host a demo agent online
Day 3	*Monitoring & Optimization*	Session: logging, latency tracking, retry logic	Understand performance tuning in production
Day 4	*Ethics, Bias & Safety*	Discussion + checklist on responsible agent use	Learners identify safe deployment practices
Day 5	*Final Project Showcase*	Learners present custom deployable agents (e.g., Code Explainer, Data Query Assistant, Content Generator)	Demonstrate full-cycle agent design & deployment

Hands-on Lab:
Deploy an interactive AI agent on Streamlit using Lyzr AI SDK.

Final Project:
Build and present a custom deployable agent — examples include a “Code Explainer,” “Data Query Assistant,” or “Content Generator.”

Learning Outcomes:

- Deploy and monitor an AI agent
- Handle user input and response streaming
- Discuss safety, bias, and governance in agent design

Evaluation & Feedback

Component	Weightage	Description
Weekly Labs & Assignments	40%	Practical implementation tasks
Final Project	40%	Fully functional deployable agent
Reflection & Discussion	10%	Conceptual clarity and peer feedback
Participation	10%	Active engagement in labs and Q&A forums

Learners receive feedback through weekly code reviews and mentor-led discussions.

Industry Relevance

With the rapid rise of autonomous AI systems, developers must understand how to harness LLMs effectively. **Lyzr AI** is at the forefront of making agentic AI accessible through a developer-friendly SDK.
This course bridges the gap between conceptual AI understanding and practical application, preparing developers to build scalable, intelligent agents aligned with Lyzr’s mission to democratise **AI agent development**.

Tools & Frameworks

- **Languages:** Python
- **Framework:** Lyzr AI SDK
- **LLMs:** OpenAI GPT / Local models via Ollama
- **Databases:** Chroma / FAISS for vector memory
- **UI:** Streamlit / Flask
- **Version Control:** GitHub
- **Documentation:** Markdown & Jupyter Notebooks