

## Complete Agentic AI Bootcamp

Master agentic AI with LangGraph and LangChain. Build multi-agent systems, RAG solutions, chatbots, and production-ready agent workflows with hands-on projects.

Format: Hands-on Bootcamp

Duration: Self-paced / Project-driven

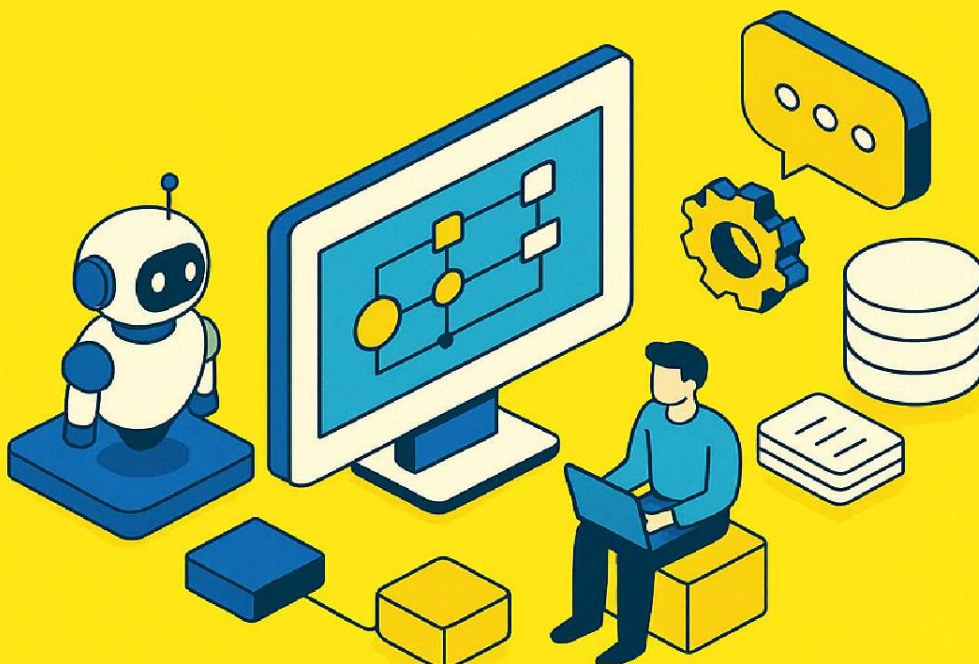
Brand: Lotus IT Hub

### Description

Are you excited about the future of AI where intelligent agents can think, act, and collaborate to solve complex tasks autonomously? Welcome to the Complete Agentic AI Bootcamp with LangGraph and LangChain — your one-stop course to master the art of building agentic AI applications from scratch!

This course is designed to teach you everything you need to know about Agentic AI, LangGraph, and LangChain — two of the most powerful frameworks for building intelligent AI agents and multi-agent systems. You will start by understanding the fundamentals of Agentic AI — how it differs from traditional AI models, the key components of agents (memory, tools, decision-making), and real-world use cases.

We will then dive deep into LangGraph, a cutting-edge framework that helps you design complex agent workflows using graphs, events, and state transitions. You'll also learn how to combine LangChain's power with LangGraph to build production-ready agent applications.



Throughout the course, you will build real-world projects step-by-step, including:

- Creating single intelligent agents with memory and tool-usage capabilities.
- Designing multi-agent collaboration systems with message passing and shared goals.
- Implementing autonomous research assistants, task automation bots, and retrieval-augmented generation (RAG) agents.

You will not just learn theory — you will build and deploy multiple end-to-end agentic applications, gaining real-world experience in constructing powerful AI systems. By the end of this course, you will have the skills and confidence to create your own AI agents and deploy complex agentic applications for various domains like search, research, task planning, customer support, and beyond.

## What you'll learn

- Understand the core principles of Agentic AI and how to design intelligent, autonomous agents for real-world tasks.
- Master building AI agents using LangGraph, including creating workflows, managing agent state, memory, and event-driven behavior.
- Develop and deploy multi-agent collaborative systems that can communicate, reason, and solve complex problems together.
- Implement hands-on projects to create powerful agentic applications like autonomous research agents, task automation systems, and knowledge retrieval assistants.

## Course content

### Welcome

- Welcome
- Installation Of Anaconda And VS Code Editor
- Creating Virtual Environments Using Conda
- Creating Virtual Environments Using UV Package Manager
- Getting Started With VS Code

## Python Basics

- Python Basics- Syntax And Semantics
- Variables In Python
- Basic Datatypes In Python
- Operators In Python
- Conditional Statements (if, elif, else)
- Loops In Python
- List And List Comprehension In Python
- Practical Examples Of List
- Sets In Python
- Dictionaries In Python
- Tuples In Python

## Functions and Advanced Python

- Getting Started With Functions
- More Coding Examples With Functions
- Python Lambda Function
- Maps Functions Python
- Filter Function In Python
- Import Modules And Package In Python
- Standard Library Overview
- File Operation In Python
- Working With File Paths
- Exception Handling
- Classes And Objects In Python
- Inheritance In OOPS
- Polymorphism In OOPS

- Encapsulations In OOPS
- Abstraction In OOPS
- Magic Methods In Python
- Operative Overloading In Python
- Custom Exception Handling
- Iterators In Python
- Generators In Python
- Function Copy.Closures and Decorators
- Numpy In Python
- Pandas-DataFrame And Series
- Data Manipulation With Pandas And Numpy
- Reading Data From Various Data Source Using Pandas
- Logging Practical Implementation In Python
- Logging With Multiple Loggers
- Logging With A Real World Examples

### **Introduction to AI Frameworks**

- Introduction To Pydantic
- Pydantic Practical Implementation
- Getting Started With Langchain And Open AI
- Creating Virtual Environment
- Important Components Of LangChain
- Data Ingestion With Documents Loaders
- Recursive Character Text Splitter
- Character Text Splitter With Langchain
- HTML Header Text Splitter
- Recursive Json Text Splitter

- Introduction To OPENAI Embeddings
- Ollama Embeddings
- HuggingFace Embeddings
- Vector Stores-FAISS
- Vector Store And Retriever- Chroma DB
- Building Important Components Of Langchain
- Building GENAI Apps
- Understanding Retrievers And Chains
- Introduction To Ollama And Set Up
- Simple GenAI App Using Ollama
- Tracking GENAI App Using Langsmith
- Getting Started With Open Source Models Using Groq API
- Building LLM Prompt And StrOutput Parser Chain With LCEL
- Deploy Langserve Runnable And Chains As API

### **Building Chatbots**

- Building Chatbot With Message History Using Langchain
- Working With Prompt Template And Message ChatHistory Using Langchain
- Managing the Chat Conversation History Using Langchain
- Working With VectorStore And Retriever
- What is Ai Agent Vs Agentic AI
- Some More Examples

## LangGraph Fundamentals and Advanced Topics

- Introduction To LangGraph
- Getting Started LangGraph Application- Creating The Environment
- Setting Up OpenAI API Key
- Setting Up GROQ API KEY
- Setting Up LangSmith API Key
- Developing A Simple Graph or Workflow Using LangGraph- Building Nodes And Edges
- Building Simple Graph StateGraph And Graph Compiling
- Developing LLM Powered Simple Chatbot Using LangGraph
- State Schema With DataClasses
- Pydantic
- Chain In LangGraph
- Routers In LangGraph
- Tools And ToolNode With Chain Integration- Part 1
- Tools And Tool Node With Chain Integration-Part 2
- Building Chatbot With Multiple Tools Integration- Part 1
- Building Chatbot With Multiple Tools Integration-Part 2
- Introduction To Agents And ReAct Agent Architecture In LangGraph
- ReAct Agent Architecture Implementation
- Agent With Memory In LangGraph
- Streaming In LangGraph
- Streaming using astream events Using Langgraph
- LangGraph Studio
- Prompt Chaining
- Prompt Chaining Implementation With Langgraph
- Parallelization

- Routing
- Orchestrator-Worker
- Orchestrator Worker Implementation
- Evaluator-optimizer
- Human In The Loop With LangGraph Workflows
- Human In the Loop Continuation
- Editing Human Feedback In Workflow
- Runtime Human Feedback In Workflow

### **Agentic RAG**

- Agentic RAG Theoretical Understanding
- Agentic RAG Implementation- Part 1
- Agentic RAG Implementation-Part 2
- Corrective RAG Theoretical Understanding
- Corrective RAG Practical Implementation
- Adaptive RAG Theoretical Understanding
- Adaptive RAG Implementation

### **Project: Task Automation Agent**

- Introduction And Overview
- Project Set Up With VS Code
- Setting up The Github Repository
- Setting Up The Project Structure
- Designing The Front End Using streamlit
- Implementing The LLM Module In Graph Builder
- Implementing The Graph Builder Module
- Implementing The Node Implementation
- Integrating the Entire Pipeline With Front End
- Testing The End To End Agentic Application

**Project: Autonomous Research Agent**

- Introduction To The Project
- Implementing The Front End With Streamlit
- Implementing GraphBuilder and Search Tools Pipeline
- Implementing Node Functionality With End To End Agentic Pipeline

**Project: AI News Summarization Agent**

- Project Introduction
- Building the Front End With Streamlit
- Building The AI News State Graph Builder
- Tavily Client Search Fetch News Node Implementation
- AI News Summarize Node Functionality Implementation
- Save Results Node Functionality Implementation
- Running The Entire AINEWS Agentic Workflow

**Project: Blog Generation Agent**

- Introduction And Project Demo
- Building Project Structure Using UV Package
- Blog Generation Graph Builder And State Implementation
- Blog Generation Node Implementation Definition
- Creating Blog Generating API Using FAST API
- Integrating Langgraph Studio For Debugging
- Blog Generation And Translation With Language
- Building Blog Generation And Translation Graph Builder
- Blog Generation And Translation Node Implementation
- Testing In Postman And Langgraph Studio

## Model Context Protocol

- Introduction To Model Context Protocol
- Important Components Of MCP
- Communication Between Components Of MCP
- Demo Of MCP With Claude Desktop
- Cursor IDE Installation
- Getting Started With Smithery AI
- Building MCP Servers With Tools And Client From Scratch Using Langchain
- Multi-Agent Travel Assistant Using LangGraph

## Who this course is for

- AI/ML Engineers and Developers who want to build advanced AI agent workflows and autonomous applications.
- Data Scientists and Researchers looking to integrate agentic behavior into their data-driven projects.
- Tech Enthusiasts and Students eager to explore the next generation of AI application development with practical hands-on projects.
- Software Engineers interested in learning how to orchestrate multi-agent systems using modern frameworks like LangGraph.