6-Month AI Agent Mastery Course

Week 1 – Absolute Basics: AI, APIs & Automation

You will learn:

- What is AI, LLM, Prompt, Agent (simple, non-technical intro).
- What are **APIs**, **HTTP**, **JSON** (in very simple terms).
- Intro to **OpenAI / other LLM APIs**: how a chatbot works behind the scenes.
- Overview of **Make** and **n8n** – what they are, where they are used.

Hands-on mini-project:

- Create a simple **"Idea Generator"**:
    - ο Google Sheet for user input → Make/n8n workflow → call OpenAI → write AI-generated ideas back to Sheet.

Week 2 – No-Code Automation with Make.com

You will learn:

- Make interface: scenarios, modules, triggers.
- **HTTP module** – how to call any AI API (OpenAI, Anthropic, etc.).
- Using **Google Sheets, Gmail, Webhooks** with Make.
- Basics of error handling & logging.

Hands-on mini-project:

- Build a **Content Assistant**:
    - ο When you add a topic in a Google Sheet → Make calls AI → generates post ideas & emails them to you.

Week 3 – n8n Fundamentals: Visual AI Workflows

You will learn:

- Installing/using **n8n** (cloud or local).
- Nodes, triggers (webhook, cron, manual), basic flow control.
- Connecting n8n with:
    - ο OpenAI (or similar)

- o Gmail
- o Google Sheets / Notion
- Basic **prompt engineering**: system prompt, user prompt, variables.

Hands-on mini-project:

- Build a **"Reply-to-Email AI Assistant"**:
  - o When a new email arrives → n8n drafts a smart reply using AI → stores draft in Sheet or sends auto-reply.

Week 4 – Multi-step Agents in n8n / Make

You will learn:

- Designing **multi-step agents**:
  - o Collect data → call AI → update CRM/Sheets → send email.
- Using **split, IF, Switch** nodes in n8n.
- Using **Routers, Filters, Iterators** in Make.
- Building **stateful conversations** (passing memory/context in the workflow).

Hands-on mini-project:

- Build a **Lead Qualification Chat Agent (text)**:
  - o User fills a form (Tally/Typeform) or WhatsApp/Telegram → AI qualifies lead → saves to Sheet/CRM → sends email to sales.

Week 5 – Python from Zero (for Automation)

You will learn:

- Python basics (no prior coding required):
  - o Variables, data types, lists, dicts, loops, functions.
- Working with **JSON** in Python (important for webhooks & AI responses).
- Calling APIs using **requests** library.
- Handling secrets (API keys) safely.

Hands-on mini project:

- Build a **Python script** that:
  - o Takes a topic from the user → calls AI API → saves result into a local JSON/CSV file.

Week 6 – Python for AI Agents & Tools

You will learn:

- Structuring a small Python project.
- Parsing AI responses, adding **guardrails** (e.g., check for missing fields).
- Basics of **vector databases** conceptually (embeddings, similarity).
- Using a simple local file or SQLite/JSON as "memory" for your agent.

Hands-on mini-project:

- Build a **Q&A helper**:
  - ○ Load a small FAQ text file → Python script uses AI + your FAQ text → answers user questions using that context.

Week 7 – FastAPI Basics: Turning Python into Web Services

You will learn:

- What is **FastAPI** and why we use it for AI tools.
- Creating basic endpoints: GET and POST.
- Receiving **JSON from Make/n8n** and returning JSON back.
- Using **Pydantic models** for request/response validation.
- Running FastAPI locally with **Uvicorn**.

Hands-on mini-project:

- Build a **"Custom AI Tool API"**:
  - ○ Endpoint /summarize → accepts text → calls AI → returns summary.
  - ○ Call this endpoint from n8n/Make via HTTP node.

Week 8 – Advanced FastAPI for AI Agents

You will learn:

- Structuring a **multi-route FastAPI project**.
- Handling authentication (API keys, basic security).
- Streaming responses basics (if needed conceptually).
- Integrating with databases (SQLite or Supabase/PlanetScale conceptually).
- Error handling & logging.

Hands-on mini-project:

- Build a **backend for a Lead Assistant**:
  - o FastAPI endpoints to:
    - ♣ Create lead
    - ♣ Qualify lead using AI
    - ♣ Return recommended next action
  - o Connected to n8n/Make to automate "Notify sales on Gmail/Slack".

Week 9 – Building Real AI Agents (Tools, Memory, Reasoning)

You will learn:

- Agent concepts:
  - o **Tools** (APIs your agent can use)
  - o **Memory** (short-term vs long-term)
  - o **Reasoning** (ReAct-style: think → act → observe → think).
- Using Python with:
  - o A framework (LangChain/LangGraph/ custom minimal version – explained at high level).
- Designing tool-based agents that:
  - o Call external APIs (weather, CRM, calendar)
  - o Decide which tool to use based on user query.

Hands-on mini-project:

- Build an **AI "Task Planner" agent**:
  - o User gives a goal → agent breaks into steps → saves a task list in Google Sheets/Notion via n8n/Make.

Week 10 – Intro to Voice AI & Vapi

You will learn:

- What is **Vapi** and how voice AI pipelines work:
  - o STT (speech to text)
  - o LLM (brain)
  - o TTS (text to speech)
- Setting up a basic **Vapi project**:
  - o Configuring an assistant.
  - o Using built-in logic flows vs connecting to your own backend.

- Designing **call flows** (greeting → questions → branching logic → end-of-call summary).

Hands-on mini-project:

- Create a simple **Inbound Call Bot** using Vapi:
    - ο Greets the caller, collects name + reason for calling.
    - ο Sends call summary to your email or Google Sheet via webhook → n8n/Make.

Week 11 – Advanced Voice Agents with Vapi + FastAPI + n8n/Make

You will learn:

- Connecting Vapi to your **FastAPI backend** via webhooks.
- Letting the voice agent:
    - ο Use Tools (e.g., check availability, create booking, log a lead).
    - ο Call external APIs via your FastAPI logic.
- Handling edge cases: silence, interruptions, invalid data.
- Logging conversations, saving transcripts.

Hands-on mini-project:

- Build a **Voice-Based Appointment/Lead Agent**:
    - ο Caller speaks → Vapi + AI collects info (name, phone, interest, time).
    - ο Your FastAPI endpoint validates + stores data.
    - ο n8n/Make flow:
        - ♣ Creates a calendar event
        - ♣ Updates Sheet/CRM
        - ♣ Sends confirmation email/WhatsApp.

Week 12 – Final Capstone: End-to-End AI Agent System

You will build a complete system combining everything:

Example capstone (customize as you like):

"Real Estate / Coaching / Service Business AI Assistant"

Includes:

1. **Text Agent:**
    a. Website/WhatsApp form or chatbot → n8n/Make → AI → FastAPI tools → save lead & send email.
2. **Voice Agent (Vapi):**
    a. Inbound phone calls → Vapi voice AI → uses FastAPI tools to:
        i. Check slots
        ii. Book calls/visits
        iii. Log leads in Sheets/CRM
        iv. Trigger n8n/Make workflows.
3. **Backend (FastAPI):**
    a. Endpoints for:
        i. Create/update leads
        ii. Get time slots
        iii. Summarize call or chat history
    b. Connected to a simple DB (or Google Sheets/Notion via API).
4. **Ops & Deployment Plan (basic):**
    a. How to host FastAPI (Render/Railway/other).
    b. How to make n8n/Make workflows robust.
    c. How to test, debug, and improve prompts.

Week 13 – LangChain Fundamentals

You will learn:

- What is **LangChain** & why it exists
- Concepts:
    o Chains
    o Prompts
    o Models
    o Memory
    o Output parsers
- How LangChain connects:
    o LLM → tools → memory → retrievers

Mini-project:

✅Build a **LangChain chatbot in Python**

- Add system prompt
- Use memory
- Ask intelligent follow-ups

Week 14-15 – Agents & Tools with LangChain

You will learn:

- Tool-based agents
- Function calling
- ReAct pattern
- How agents "decide" which tools to use

Mini-project:

✓Build an **AI Assistant with tools**

- Calculator tool
- File lookup tool
- API caller tool
- Let AI choose the tool

Week 16-17 – RAG (Retrieval Augmented Generation)

You will learn:

- What is RAG and why agents need it
- Embeddings
- Chunking strategies
- Vector databases:
- How data flows:
    - Load → chunk → embed → retrieve → answer

Mini-project:

✓Build a **Document Q&A system**

- Upload PDFs / text
- Query them via chatbot

Week 18 – RAG + FastAPI + Agents

You will learn:

- Turn RAG into an API
- Connect RAG to:
  - n8n
  - LangChain
  - Agents
- Add fallback logic
- Guardrails & validation

Mini-project:

✓Create a **Private AI Knowledge System**

- Employees ask
- AI answers from internal docs
- Hosted as API

Week 19 – Deployment Basics

You will learn:

- What is deployment
- Docker basics (light)
- Environment variables
- API security

Mini-project:

✓Deploy your FastAPI AI backend live

Week 20 – Deploying Agents & RAG Systems

You will learn:

- Hosting LangChain apps

- Deploying RAG systems
- Memory persistence
- Cloud database intro

Mini-project:

✓Deploy:

- AI agent
- RAG API
- Voice webhook backend

Week 21 – SaaS Architecture for AI Products

You will learn:

- SaaS system design
- User auth
- Logging & monitoring
- Cost optimization
- API rate limits
- Prompt management

Mini-project:

✓Design an **AI SaaS architecture diagram**

Week 22 – Final Mega Capstone

Build a PRODUCTION-LEVEL AI SYSTEM:

Includes:
✓LangChain agent
✓LangGraph flow
✓RAG system
✓Voice agent (Vapi)
✓Backend in FastAPI
✓Workflows in n8n / Make
✓Deployed on cloud

Examples:

- AI Office Assistant
- Sales Agent
- Ed-Tech Tutor
- Customer Support AI
- Real Estate AI

Week 23 – Career & Productization

You will learn:

- Freelancing with agents
- Selling automations
- SaaS opportunities
- Building portfolio
- Cold outreach

Week 24 – Final Demo & Certification

Activities:

✓Project Demo Day
✓Code Review
✓Optimization tips
✓Certification