



Building Apps with OpenAI, LangChain & Hugging Face

Duration: 4 Weeks | **Level:** Intermediate

Format: Lectures + Hands-on Labs + Mini Projects

Tools: Open AI API, Lang Chain, Hugging Face, Pinecone, Chroma, Flask, Stream lit

Week 1: Introduction to LangChain, OpenAI API & Hugging Face

- Overview of Lang Chain, Open AI API, and Hugging Face
- Setting up OpenAI and Hugging Face APIs, understanding API limits
- LangChain basics: Chains, Agents, Memory
- Integrating OpenAI's GPT-3 and Hugging Face models into LangChain
- **Lab:** Build a simple chatbot using Open AI + Hugging Face via Lang Chain

Week 2: Working with APIs & Data Storage

- Integrating external APIs with Lang Chain (e.g., weather, news)
- Using Hugging Face transformers for various NLP tasks
- Vector databases (Pinecone, Chroma) for storing and querying embeddings
- LangChain document processing (text extraction, summarization, question-answering)
- **Lab:** Create a document Q&A app using Hugging Face + LangChain + Pinecone

Week 3: Advanced LangChain & Hugging Face Features

- Memory management and session management in LangChain
- Advanced Hugging Face tasks: Text generation, summarization, translation
- Custom agent creation: Planning, reasoning, and tool integration
- Integrating Hugging Face models (transformers, BERT, GPT) into LangChain workflows
- **Project:** Build an AI-powered personal assistant with Hugging Face and LangChain, integrated with external APIs

Week 4: Real-world Applications, Deployment & Hugging Face Integration

- Best practices for optimizing API calls, error handling, and rate limiting
- Deploying LangChain and Hugging Face-based apps to the cloud (Heroku, AWS)
- Frontend integration: Creating user interfaces with Streamlit or React
- Security considerations: Managing Hugging Face API keys, privacy concerns, and model fine-tuning
- **Capstone Project:** Build a complete, deployable app (e.g., AI-powered research assistant or multilingual FAQ bot using Hugging Face transformers)