

# AI For Everyone

## Curriculum Plan

*Live Sessions + Optional n8n & Claude Modules + Async Capstone Projects*

Instructors: Chandra Sekhar | Akhila

### Module 1 — Python Essentials for GenAI – 1

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**Instructor:** Chandra

- ▶ Foundations of Python, Python Syntax & Variables
- ▶ Data Types (int, float, str, bool, list, dict, tuple, set)
- ▶ Operators (Arithmetic, Comparison, Logical)
- ▶ Conditional Statements (if, elif, else)
- ▶ Control Flow (for, while, break, continue)
- ▶ Functions (def, return, args, kwargs, lambda)

### Module 2 — LLMs Hands-On – Part 1

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**Instructor:** Chandra

- ▶ OpenAI Model Overview (GPT-4o, GPT-4o-mini)
- ▶ Chat vs Completion Models
- ▶ Temperature & Token Management
- ▶ Streamlit Basics (Building AI UIs)
- ▶ Audio Models (Text-to-Speech & Speech-to-Text)
- ▶ Hands-on: Build a Simple AI Chatbot with Streamlit

### Module 3 — ML Foundations – 1

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- ▶ Introduction to AI, ML, and Use Cases
- ▶ Types of Machine Learning (Supervised & Unsupervised)
- ▶ Datasets, Features, and Labels
- ▶ Model Training & Evaluation Basics
- ▶ Overview of Regression and Classification

### Module 4 — ML Foundations – 2

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- ▶ Introduction to Deep Learning & Neural Networks
- ▶ Layers, Neurons, and Activation Functions
- ▶ Basics of Natural Language Processing (NLP)
- ▶ Tokenization and Embeddings
- ▶ Introduction to Transformers & Attention Mechanism

### Module 5 — Agentic AI Design Patterns

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**Instructor:** Chandra

- ▶ What is Agentic AI?
- ▶ Chaining Pattern (Sequential Task Execution)
- ▶ Tool-Use Pattern (Function Calling, External APIs)

- ▶ Multi-Agent Pattern (Agent Collaboration & Delegation)
- ▶ Reflection Pattern (Self-Critique & Iterative Improvement)
- ▶ Hands-on: Build a Simple Agent using OpenAI Function Calling

## Module 6 — Python Essentials for GenAI – 2

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**Instructor:** Chandra

- ▶ File Handling (read, write, CSV, JSON)
- ▶ Exception Handling (try, except, finally, custom exceptions)
- ▶ HTTP Requests (requests library, API calls)
- ▶ OOPs (Classes, Objects, Inheritance, Encapsulation, Polymorphism)
- ▶ Decorators & Generators (Intro)
- ▶ Hands-on: Build a Python Script that Calls an External API

## Module 7 — Retrieval Augmented Generation (RAG) – Fundamentals

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**Instructor:** Chandra

- ▶ RAG Concept & Architecture
- ▶ Why RAG is Needed (LLM Limitations & Hallucinations)
- ▶ What are Embeddings? (Word2Vec, OpenAI Embeddings)
- ▶ Vector Similarity (Cosine Similarity, Dot Product)
- ▶ RAG using Plain Python (No Frameworks)
- ▶ Hands-on: Build a Simple RAG System from Scratch

## Module 8 — LangChain Fundamentals – Part 1

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**Instructor:** Chandra

- ▶ LangChain Introduction & Installation
- ▶ Prompt Templates (Static & Dynamic)
- ▶ LLM Chains (Single Chain Execution)
- ▶ Sequential Chains (Multi-step Pipelines)
- ▶ Conditional Chains (Routing & Branching)
- ▶ Hands-on: Web-to-Post Demo (URL → Summary → Social Media Post)

## Module 9 — LangChain Fundamentals – Part 2

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**Instructor:** Chandra

- ▶ Tools in LangChain (Built-in & Custom Tools)
- ▶ Agents Architecture (ReAct, Plan-and-Execute)
- ▶ Tool Calling with Agents
- ▶ Real-world Agent Use Cases (Search, Calculator, Code Interpreter)
- ▶ Agent Memory & Conversation History
- ▶ Hands-on: Build a Research Agent with Web Search

## Module 10 — RAG with LangChain – End-to-End Project

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**Instructor:** Chandra

- ▶ Document Loaders (PDF, Web, CSV, Notion)
- ▶ Text Splitters (Recursive, Character, Token-based)

- ▶ Vector Stores (FAISS & Chroma Setup)
- ▶ Chunking Strategies (Size, Overlap, Semantic)
- ▶ Retrieval Chains & QA Chains
- ▶ Hands-on: Build a Complete RAG Application with LangChain

## Module 11 — LangGraph – Fundamentals

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**Instructor:** Chandra

- ▶ LangGraph Basics (Nodes, Edges, State)
- ▶ Graph-based Agent Design
- ▶ Parallel Workflows (Fan-out / Fan-in)
- ▶ Conditional Transitions (Routing Logic)
- ▶ StateGraph vs MessageGraph
- ▶ Hands-on: Build Your First LangGraph Agent

## Module 12 — LangGraph – Advanced Workflows

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**Instructor:** Chandra

- ▶ Sequential Workflows (Step-by-Step Pipelines)
- ▶ Iterative Loops (Retry & Refinement Patterns)
- ▶ Error Handling in Graphs (Fallbacks, Retries)
- ▶ Human-in-the-Loop (Approval Nodes)
- ▶ Subgraphs & Modular Design
- ▶ Hands-on: Build a Multi-Step Research Workflow

## Module 13 — LangGraph – State, Memory & Chatbots

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**Instructor:** Chandra

- ▶ Persistence in LangGraph (Checkpointing & Reducers)
- ▶ Stateful Graph Design & Thread Management
- ▶ Memory Handling (Short-term & Long-term)
- ▶ InMemorySaver, SQLite Saver & Message Trimming
- ▶ Streaming Responses in LangGraph
- ▶ Hands-on: Build a Production-Ready Chatbot with State & Memory

## Module 14 — CrewAI – Foundations

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**Instructor:** Akhila

- ▶ Introduction to CrewAI (Why Multi-Agent?)
- ▶ Agents & Roles (Researcher, Writer, Analyst)
- ▶ Tasks & Tools Configuration
- ▶ Building an End-to-End CrewAI System
- ▶ Flows & State Management
- ▶ Hands-on: Build a Content Creation Crew

## Module 15 — CrewAI – Application Building

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**Instructor:** Akhila

- ▶ Router Concepts (Task Routing & Delegation)

- ▶ Router with LLMs (Dynamic Decision Making)
- ▶ State-Driven Flows (Conditional Execution)
- ▶ Flow Control Patterns in CrewAI
- ▶ Integrating External APIs & Tools
- ▶ Hands-on: Build a Real-World Multi-Agent Application

## Module 16 — FastAPI – Building AI-Powered APIs

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**Instructor:** Akhila

- ▶ FastAPI Introduction & Setup
- ▶ Path Parameters, Query Parameters & Request Body
- ▶ Pydantic Models & Validation
- ▶ Building REST APIs for ML/AI Models
- ▶ Serving LangChain Agents via API
- ▶ Async Endpoints & Streaming Responses
- ▶ Hands-on: Deploy a RAG API with FastAPI

## Module 17 — n8n – AI Workflow Automation (Optional)

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**Instructor:** Chandra

- ▶ n8n Basics & Interface Overview
- ▶ Workflow Design (Triggers, Nodes, Connections)
- ▶ Connecting AI Models (OpenAI, Claude) in n8n
- ▶ Integrating APIs & Databases
- ▶ Building Automated AI Pipelines
- ▶ Hands-on: Build an End-to-End AI Automation Workflow

## Module 18 — Claude Code & Claude AI – Coding and Chatting with Claude

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**Instructor:** Akhila

- ▶ Overview of Claude AI (Chat Interface, Projects, Artifacts)
- ▶ Claude Code Introduction (Agentic Coding from the Terminal & IDE)
- ▶ Delegating Coding Tasks: Writing, Debugging & Reviewing with Claude Code
- ▶ Working with Claude AI for Research, Writing & Analysis
- ▶ Prompting Best Practices for Coding & Conversational Tasks
- ▶ Hands-on: Build and Ship a Small Feature Using Claude Code

## Module 19 — Claude Cowork & Claude Design – Agentic Work and Design with Claude

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**Instructor:** Akhila

- ▶ Claude Cowork Overview (Agentic Knowledge-Work Assistant)
- ▶ Delegating Multi-Step, Multi-Tool Tasks with Cowork
- ▶ Claude Design Overview (Prototypes, Mockups & Visual Design)
- ▶ Building Landing Pages, Slides & One-Pagers with Claude Design
- ▶ Connecting Claude to Everyday Tools & Workflows
- ▶ Hands-on: Automate a Real Workflow using Claude Cowork and Claude Design