

## Generative AI Foundations

**Duration:** 40 Hours (5 Days)

**Prerequisites:** Basic computer knowledge, APIs, JSON, basic programming concepts (Python/JavaScript preferred), Git basics. No prior AI/ML experience required.

**Target Audience:** Developers, Solution Architects, AI Engineers, Business Analysts, Automation Engineers, Students.

### Module 1 – Introduction to Generative AI

- Evolution of AI
- Traditional AI vs GenAI
- Foundation Models
- LLMs
- Tokens, Embeddings, Context Window
- Transformer Architecture
- Attention Mechanism
- Hallucinations
- Labs

### Module 2 – Prompt Engineering & Evaluation

- Prompt Anatomy
- Zero/Few-shot Prompting
- Chain of Thought
- ReAct
- Role Prompting
- Prompt Chaining
- Structured Outputs
- Prompt Evaluation
- Labs

### Module 3 – Retrieval-Augmented Generation (RAG)

- Need for RAG
- Embeddings
- Vector Databases
- Chunking
- Retrieval
- Grounding
- Enterprise RAG
- Labs

## **Module 4 – Fine-Tuning Concepts**

- Pre-training vs Fine-tuning
- Instruction Tuning
- LoRA
- QLoRA
- PEFT
- When to Fine-tune vs RAG
- Labs

## **Module 5 – AI Agents**

- Agent Architecture
- Memory
- Planning
- Tool Calling
- Function Calling
- Multi-Agent Systems
- Agent Frameworks
- Labs

## **Module 6 – AI Agents & Automation**

- Agentic Workflows
- Human-in-the-loop
- Business Automation
- AI Orchestration
- Labs

## **Module 7 – Context Engineering & MCP**

- MCP Fundamentals
- Clients & Servers
- Tool Integration
- Context Management
- Voice Agents
- Labs

## **Module 8 – Vibe Coding**

- No-Code AI
- Prompt-to-App
- AI Development Platforms
- Build an AI Product
- Labs