

**Generative AI Internship Course Syllabus (45 / 90 / 180 Days)** in the same style as your Data Science syllabus.

## **Program Highlights**

### **45 Days – Foundation in Generative AI**

#### **Module 1: Introduction to Artificial Intelligence and Generative AI**

- Introduction to AI, ML, Deep Learning, and Generative AI
- Evolution of Artificial Intelligence
- Applications of Generative AI across industries
- Understanding AI workflows and ecosystems
- Introduction to modern AI use cases

#### **Module 2: Python Programming for AI**

- Python syntax and programming fundamentals
- Variables, Data Types, Loops, Functions
- Object-Oriented Programming (OOP)
- Working with APIs and JSON
- File handling and data processing

#### **Module 3: Data Handling and AI Foundations**

- Data preprocessing basics
- Working with CSV and JSON datasets
- Data cleaning concepts
- Exploratory analysis for AI systems
- Preparing structured data for AI applications

#### **Module 4: Prompt Engineering Fundamentals**

- Introduction to Prompt Engineering
- Zero-shot Prompting
- Few-shot Prompting
- Chain-of-Thought Prompting
- Prompt optimization techniques

- Structured outputs and formatting

#### **Module 5: Large Language Models (LLMs)**

- Understanding LLM architecture
- Tokenization and embeddings
- Transformers overview
- Context windows and memory concepts
- Model limitations and optimization

#### **Module 6: AI Tools and Productivity Platforms**

- AI content generation tools
- Research assistants
- AI coding assistants
- AI-powered document creation
- Workflow productivity automation

#### **Module 7: AI Application Development**

- Building AI chatbots
- Creating document assistants
- AI-powered recommendation systems
- Content generation applications
- Introduction to deployment

#### **Module 8: Real-Life Projects**

- AI Chatbot
- Resume Generator
- AI Content Generator
- Document Analyzer
- AI Assistant Mini Project

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### **90 Days – Intermediate Generative AI Engineering**

Includes all 45-day modules plus:

## **Module 9: Advanced Prompt Engineering**

- Multi-step prompting
- Prompt chaining
- Role-based prompting
- Dynamic prompts
- Prompt templates and optimization

## **Module 10: Retrieval-Augmented Generation (RAG)**

- Understanding Retrieval Systems
- Embeddings and Vector Search
- Knowledge Base Construction
- Document Retrieval
- Context Management

## **Module 11: Generative AI Frameworks**

- AI workflow architecture
- AI application structure
- Orchestration concepts
- Modular AI design
- AI pipelines

## **Module 12: AI Automation and Workflow Development**

- Workflow automation fundamentals
- Intelligent task execution
- AI integrations
- Event-driven automation
- AI process optimization

## **Module 13: Fine-Tuning and Model Optimization**

- Model customization concepts
- Fine-tuning fundamentals
- Performance measurement

- Hyperparameter understanding
- Optimization techniques

#### **Module 14: Deployment and Production Systems**

- Deploying AI applications
- Hosting fundamentals
- Performance monitoring
- API deployment
- Scalability concepts

#### **Module 15: Real-Life Projects and Case Studies**

- AI Customer Support System
- AI Learning Assistant
- AI Automation Platform
- AI Knowledge System
- Business Case Study Implementation