

**Comprehensive Generative AI for Developers**

**Course Number:** AI-106WA
**Duration:** 5 days

**Overview**

Accelebrate's comprehensive Generative AI (Gen AI) training bootcamp teaches developers to build intelligent, scalable applications using Gen AI and large language models (LLMs). This Gen AI course covers everything from the foundations of LLMs to advanced techniques like fine-tuning of LLMs, Retrieval Augmented Generation (RAG), and Vector Embeddings. Attendees also learn how to integrate LLMs into development pipelines.

**Prerequisites**

* Practical experience in Python (at least 6 months):
	+ Data Structures, Functions, Control Structures
	+ Exception Handling, File I/O, async, concurrency (recommended)
* Practical experience with these Python libraries: Pandas, NumPy, and scikit-learn
	+ Understanding of Machine Learning concepts - regression, clustering, classification
	+ ML Algorithms: Gradient Descent, Linear Regression
* Loss Functions and evaluation metrics

**Materials**

All Generative AI training students receive comprehensive courseware.

**Software Needed on Each Student PC**

All attendees must have a modern web browser and an Internet connection.

**Objectives**

* Understand Large Language Models (LLMs) and their foundational concepts, including generative AI and transformer architecture.
* Master prompt engineering techniques to effectively communicate with LLMs and achieve desired outcomes.
* Leverage LLMs to enhance software development processes, including code generation, completion, and analysis.
* Access and integrate LLMs through APIs into existing applications and services, utilizing popular libraries and frameworks like LangChain and
* Hugging Face Transformers.
* Build and deploy powerful, production-ready LLM-powered applications focusing on scalability, security, and privacy.

**Outline**

* LLM Foundations
	+ Introduction to Generative AI for Software Development
	+ Generative Models and their Use Cases
	+ Transformer architecture and its impact on LLM performance
	+ LLM Training Process - pre-training, fine-tuning, and reinforcement learning
	+ Exploring Real-World LLM Applications
* Speaking to LLMs: Prompt Engineering
	+ Prompt Engineering Introduction
	+ Techniques for creating effective prompts
	+ Zero-Shot Learning, Few-Shot, and Chain-of-Thought
	+ Prompt Engineering for Developers
	+ Leverage LLMs for code generation, completion, and analysis
	+ Best practices for prompt design and optimization in a development context
	+ Optimize prompting workflows for next-generation scripting
	+ Handle and process LLM-generated code
	+ Integrate prompts into development pipelines
* Accessing LLMs via APIs
	+ Accessing GPT 3.5 and GPT 4 via the OpenAI API
	+ Roles and Conversation Threading
	+ Popular LLMs, APIs, and Libraries - Generative AI Tech Stack
	+ LangChain for Integration
	+ Closed-Source LLMs vs Open-Source LLMs
	+ Chat Agents for Querying Developer Documentation via API
* Enhancing LLMs with Fine-Tuning
	+ State of the Art Open-Source LLMs
	+ Building Pipelines with HuggingFace Transformers Library
	+ Fine-Tuning with the Hugging Face Transformers library and code-specific data
* Building LLM-powered Applications
	+ Vector Embeddings
	+ Ingesting Private Data with LlamaIndex
	+ Types of Indexing and Chunking for Data Ingestion
	+ Introduction to Retrieval Augmented Generation (RAG)
	+ Semantic Search for Code libraries
* LangChain Integration and Advanced RAG
	+ LLM Chains and Prompt Templates
	+ The LangChain “Tools” Library
	+ Enterprise-grade RAG Pipelines
	+ RAG Pipeline Optimization and Performance Monitoring
* Enterprise API Applications
	+ Generative AI Tech Stack
	+ Scalable and Efficient Architectures
	+ Privacy/Security Considerations with Enterprise Data
	+ Conversational Agents in Enterprise
	+ Best Practices for production-ready LLM Applications
	+ Enterprise Application Pipelines
	+ Choosing the right foundation model
	+ Cost and ROI Evaluation Strategy
* LLM Deployment for Developers
	+ LLM Deployment Frameworks
	+ Introduction to LLMOps for Developers
	+ LLM Security Considerations
	+ Enterprise Privacy
	+ Cloud Deployment vs Local (Private) Serving
* Conclusion