Generative AI with Gemini

Total Duration: 10 Hours

Course Overview

This program is designed to introduce participants to the **Gemini family of models** and **Google AI Studio** for building practical AI-driven solutions. Through guided sessions and hands-on prototyping, learners will explore how to design, deploy, and optimize applications powered by state-of-the-art generative AI.

The course moves from **core concepts** to **applied development**, helping participants gain both **technical know-how** and the ability to create **real-world AI experiences**—ranging from chat assistants to multimodal apps.

Learning Outcomes

By the end of this program, participants will be able to:

- Explain the capabilities and unique features of **Google's Gemini models**.
- Apply **prompt engineering strategies** to control outputs effectively.
- Develop **chatbots, Q&A tools, and multimodal applications** using Gemini.
- Integrate **retrieval-augmented generation (RAG)** for knowledge-grounded responses.
- Prototype and publish **shareable AI applications** with frameworks like Streamlit and Gradio.
- Translate AI concepts into solutions for industries such as education, business, and healthcare.

Prerequisites

- Basic familiarity with **AI and machine learning concepts**.

- Comfort with **Python programming** is recommended.
- Enthusiasm to experiment with **AI-driven creativity and applications**.

Course Modules

Day 1 – Exploring Gemini and AI Studio

2.5 Hours

- What is Generative AI? How LLMs shape the AI ecosystem
- Gemini models in focus: **Gemini 1.5 Pro, Gemini Flash, Gemini Nano**
- Gemini's multimodal strengths: text, code, and images
- Getting started in **Google AI Studio**:
    - Navigating the interface
    - Model selection and usage limits
- Hands-on: Running your **first prompt** in AI Studio

Day 2 – Creating Interactive Apps with Streamlit

2.5 Hours

- Introduction to Streamlit for AI-driven UIs
- Building a **simple chat interface** with Gemini via Python SDK
- Adding interactivity: sliders, controls, and session history
- Deploying your app: local runs & Streamlit Cloud
- Mini-project: **Q&A bot for course materials**

Day 3 – Rapid Prototyping with Gradio

2.5 Hours

- Gradio basics: blocks, components, and layouts
- Designing a conversational app with Gemini
- Building a multimodal prototype: **image input → text response**
- Comparing **Streamlit vs Gradio**: when to use each
- Publishing lightweight demos on **Hugging Face Spaces**

Day 4 – Advanced Patterns: RAG & Multimodality

2.5 Hours

- Why RAG? Grounding responses with external knowledge
- Using **Gemini embeddings** and connecting with **vector databases** (ChromaDB, FAISS)
- Integrating with **LangChain** for retrieval workflows
- Exploring **multimodal applications**: combining text + images
- Deployment pathways: Google Cloud, AI Studio projects, or public demo platforms

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Tools & Setup

- **Software**: Python 3.x, Jupyter/VS Code, Google AI Studio, Streamlit/Gradio
- **Hardware**: Laptop/Desktop (Core i5 or above, 8GB RAM minimum)
- **Internet**: Stable broadband (30 Mbps+)

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SOFTWARE REQUIREMENT
• Python 3.x • IDEs: PyCharm, Jupyter Notebook, or VS Code

HARDWARE REQUIREMENT
• Desktop / Laptop with Core i5 or higher Processor • Windows 10 OS or Equivalent • 8 GB of RAM • Minimum 30 MBPS internet connection.