GEN AI FOUNDATIONS TRACK – 2025 EDITION

" Create, innovate, and automate with AI."

Market Demand Note

Generative AI is transforming industries — from content creation to product design — enabling professionals to automate creative tasks and develop AI-powered applications. Skills in generative models are highly sought after in marketing, product development, and technology sectors.

Duration: 6 weeks | **Mode**: Online/Offline

📘 Gen AI Foundations Track — 2025 Edition

Table of Contents

- Hands-on: Deliver a portfolio-ready interactive app or notebook

Detailed Content

Week 1: Introduction to Generative AI

- **Definition: Generative AI creates new content (text, images, music) based on training data.**
- **Examples: ChatGPT for conversation, DALLE-3 for images, GitHub Copilot for code.**
- **Industry Applications: Marketing content, design automation, customer support, education.**
- **Generative vs. Traditional AI: Traditional AI classifies or predicts; generative AI creates.**
- **Hands-on: Explore demos of ChatGPT, DALL·E, and GitHub Copilot. Discuss use cases in groups.**

Week 2: Large Language Models (LLMs)

- **What are LLMs? Models trained on vast text data to understand and generate human-like text.**
- **How GPT works: Transformer architecture, attention mechanisms, training on internet-scale data.**
- **Prompt Engineering: Crafting inputs to get desired outputs. Techniques: zero-shot, few-shot, chain-of-thought.**
- **Hands-on: Sign up for OpenAI API (free tier), generate text responses to various prompts, experiment with prompt styles.**

Week 3: Image Generation Models

- **Stable Diffusion, DALL·E, Midjourney: Open-source and commercial tools for image generation.**
- **How it works: Diffusion models, CLIP embeddings, latent space manipulation.**
- **Hands-on: Use Stable Diffusion or DALL·E via API or Web UI to create images from text prompts (e.g., "a futuristic cityscape at sunset"). Compare outputs.**

Week 4: Building with Generative AI APIs

- **API Basics: Authentication, endpoints, rate limits, billing.**

- **Chatbots: Use OpenAI API to build a Q&A or conversational agent.**
- **Hugging Face Models: Access pre-trained models (e.g., GPT-2, BERT) via transformers library.**
- **Hands-on: Build a Python script that takes user input, calls an LLM API, and returns a response. Integrate Hugging Face pipeline for local inference.**

Week 5: Enhancing Outputs & Ethics

- **Prompt Optimization: Iterative refinement, templating, controlling creativity/temperature.**
- **Multimodal Generation: Combine text and image APIs (e.g., generate a story and illustrate it).**
- **Ethical Issues: Hallucinations, bias, deepfakes, copyright, environmental impact.**
- **Hands-on: Fine-tune prompts for travel itinerary generation. Generate both a text plan and a matching image. Discuss ethical scenarios in class.**

Week 6: Final Project – AI-Powered Travel Itinerary & Poster Generator

- **Project Goal: Build an app that takes travel preferences (e.g., destination, budget, interests), generates a detailed itinerary using an LLM, and creates a travel poster using an image model.**
- **Tasks:**
    - **Data input handling (CLI or simple web form)**
    - **Call OpenAI API for itinerary text**
    - **Call DALL·E/Stable Diffusion API for poster image**
    - **Combine outputs into a single notebook or web app**
- **Output: Working code, Jupyter notebook, or deployed demo. Present the project, explain design choices, and discuss limitations.**
- **Assessment: Functionality, creativity, code quality, presentation, handling of edge cases.**

Tools Covered

- **Python (core language for APIs and scripting)**
- **OpenAI API (GPT, DALL·E)**

- **Hugging Face Transformers (local and cloud models)**
- **Stable Diffusion (via API or local install)**
- **Google Colab (cloud notebooks for easy experimentation)**
- **Jupyter Notebook (documentation and sharing)**

Final Project Details

Title: AI-Powered Travel Itinerary & Poster Generator
Goal: Automate travel planning and visual marketing using generative AI.
Tasks:

- **Accept user input (destination, dates, interests)**
- **Generate a detailed, personalized travel plan using an LLM**
- **Create a visually appealing travel poster using an image generation model**
- **Deliver as an interactive notebook, script, or simple web app**
  Output: Portfolio-ready project with code, visuals, and a clear README.