

Address: Above Black Stone Café, Osmanpura,
CSN, Chh. Sambhaji Nagar.
Call: 7841821915



Generative AI Internship and Classes

Module 1: Introduction to Python Programming

- Introduction to Python and its role in AI
 - Python installation and setup (Anaconda/Jupyter/VS Code)
 - Variables, Data Types, and Operators
 - Control Structures: if, for, while
 - Functions, Modules, and Packages
 - File Handling Excels, CSV, JSON, etc.
 - Introduction to virtual environments and pip
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Module 2: Python for Data Handling

- Lists, Tuples, Sets, and Dictionaries
 - List Comprehensions and Lambda Functions
 - Working with CSV, JSON, and TXT files
 - Pandas for DataFrames and data manipulation
 - NumPy for numerical computations
 - Data visualization libraries
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Module 3: Foundations of Generative AI

- Introduction to Artificial Intelligence and Generative AI
- Transformer Architecture and its background.
- Types of Generative Models: Text, Image, Audio, Video
- Overview of:
 - All GPT Models, Deepseek, etc.
 - Image Generation Models like stable diffusion, piclumen, wan
 - Video Generation Models like wan 2.1, runwayml, klingai
 - Audio Generation models like elevenlabs

Module 4: Working with APIs in Python

- HTTP Requests using requests
- Consuming public APIs (e.g., OpenAI, Hugging Face)
- Authentication and API keys
- Parsing and processing JSON responses
- Rate limiting and error handling

Module 5: Text Generation with Python

- Using OpenAI's GPT via Python
- Prompt engineering basics and advance
- Text summarization, rewriting, and Q&A bots
- Fine-tuning and embedding concepts
- Building a simple chatbot using OpenAI API

Module 6: Image Generation with Python

- Prompting for image generation
- Saving and displaying generated images
- Optional: Introduction to Stable Diffusion, Piclumen

Module 7: LangChain and Vector Databases – Creating Chatbots

- Introduction to LangChain
 - Building RAG (Retrieval-Augmented Generation) apps
 - Embeddings and chunking text
 - Using FAISS or ChromaDB for vector search
 - Building a document Q&A assistant
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Module 8: Streamlit and Web App Development – Creating Web Application

- Creating simple web apps using Streamlit
 - Integrating AI models with user interfaces
 - Uploading files and taking user input
 - Hosting your app (Streamlit Cloud, Render, etc.)
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Module 10: Fine-tune LLMs

- Use open source LLMs on local.
 - Fine-tune open source LLMs for custom use-case
 - Learn effective parameters of fine-tuning
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Module 9: Agentic AI

- Creating Agentic AI solutions
 - Autogen, Langgraph and etc
 - Learn Advance topics of Agentic AI
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Module 10: Capstone Projects

1. **PDF Q&A App** – Chat with your document
 2. **Your Own AI Tool** – combine APIs, prompts, and UI
 3. **Real Time Projects** – Work on Real Time Projects
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Module 10: Bonus Topics (Optional)

- Hugging Face Transformers library
- LangChain agents and tools
- Automating workflows with AI and Python scripts
- Ethical considerations and responsible AI usage