

Generative AI –Learn by Doing

Indian Institute of Technology Kharagpur

Summary:

An immersive, interactive course intended to take participants from Python foundations all the way to the construction and deployment of advanced generative AI (GenAI) applications. Participants will receive robust theoretical foundations and strong practical exposure through structured modules, real-world assignments, and a capstone project. Perfect for current and aspiring AI engineers, researchers, and professionals.



Broad Topics

Core Technical Concepts

- Python programming, data structures, machine Learning fundamentals, neural networks
- Deep learning concepts and training methods
- RNNs, LSTMs, GRUs, and sequence modeling
- Transformer architecture, foundation models
- Fine-tuning strategies: LoRA, QLoRA, Hugging Face workflows

Tools, Applications & Ethics

- LangChain components and LangChain Expression Language (LCEL)
- Prompt engineering and LLM applications
- Retrieval-Augmented Generation (RAG): embeddings, vector databases, hybrid search
- Multi-agent systems: agent design, communication, coordination
- Model deployment: APIs, scaling, monitoring

Eligibility:

- **UG students** in Computer Science, Electronics, Electrical Engineering, or related disciplines
- **PG/Research Scholars** specializing in Machine Learning, AI, Data Science, or related fields
- **Working Professionals** aiming to advance skills in Generative AI and LLM applications
- **Entrepreneurs and Startup Teams** interested in developing GenAI solutions for business challenges

Program Fees:

Students- INR 5k ; Working Professionals : INR 10k,

Program Coordinators- Prof. Mrigank Sharad, Prof. Amit K. Dutta

Simulation Modules:

Core Frameworks & Tools

- **Python** – foundational scripting and logic building
- **LangChain** – modular framework for building LLM applications
- **Hugging Face Transformers** – pre-trained model integration and fine-tuning
- **Jupyter Notebooks** – interactive development and experimentation

Hands-on Modules

- Text Processing & NLP Tasks
- Neural Network Implementation
- Text Generation Models
- Prompt Engineering Simulations
- Retrieval-Augmented Generation (RAG)
- Fine-tuning Exercises
- Model Deployment, multi-agent Interaction Simulations

Timing and Schedule:

May 20- July 20

Lecture Hours per week: 15

Timing- Live -5 PM to 8 PM, recording accessible, doubt clearing and interaction sessions

Weekly Quizzes, Simulation Modules with online demonstrations

Platform- Gmeet + Youtube

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Application Deadline : May 18th

[Application Link](#)