Rajendra Mishra School of Engineering Entrepreneurship

भारतीय प्रौद्योगिकी संस्थान खड़गपुर

INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

# Generative AI

learn by Doing

Generate

**Dec 1st 2025 - Feb 28, 2026**


## 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

## 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


## Certification :

Upon completion of the program you will get a certificate from IIT Kharagpur - CEP Department.

## 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

## Timing and Schedule :

Program Duration: 8 Weeks

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: Ktech

## Application Deadline :

- **24th October 2025**

## Program Information :

**Program Fees:**

Students: INR 10k + 18% GST

Working Professionals: 30k + 18% GST

**Program Coordinators:**

Prof. Mrigank Sharad, Mr. Ankit Soni
Dr. Piya Sen

## Contact Information :

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