

Hands-on Approach to Advanced AI for Real-World Applications (HAAI) ++

Dive into the world of GEN AI, LLM and Agentic AI Master the art of turning futuristic dreams into practical realities!

Here is everything you need to know about the “IIT Kharagpur AI4ICPS Certificate Programme Hands-on Approach to Advanced AI for Real-World Applications (HAAI) ++ - Cohort 1” Schedule:

| Course Starts on 19 th Jul. | July 2025 | | | | | | | August 2025 | | | | | | | September 2025 | | | | | | | Course Ends on 13 th Sep. |
|--|-----------|----|----|----|----|----|----|-------------|----|----|----|----|----|----|----------------|----|----|----|----|----|----|--------------------------------------|
| | Su | M | Tu | W | Th | F | Sa | Su | M | Tu | W | Th | F | Sa | Su | M | Tu | W | Th | F | Sa | |
| | | | 1 | 2 | 3 | 4 | 5 | | | | | | 1 | 2 | | 1 | 2 | 3 | 4 | 5 | 6 | |
| | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | |
| | 27 | 28 | 29 | 30 | 31 | | | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 28 | 29 | 30 | | | | | |
| | | | | | | | | 31 | | | | | | | | | | | | | | |

The dates highlighted in blue indicate the scheduled date for the live lecture.



Session Details:

| Week | Session Title | Session Date | Start Time (IST) | End Time (IST) | QA Time (IST) |
|------|---|--------------|------------------|----------------|------------------|
| 1 | Evolution of AI: From Rule-Based to Generative Models (Theory) | 19-Jul-25 | 09:00 AM | 10:00 AM | 10:00 - 10:15 AM |
| 1 | Introduction to Transformer Models (Self-Attention, Positional Encoding) (Theory) | 19-Jul-25 | 10:15 AM | 11:30 AM | 11:30 - 11:45 AM |
| 1 | Overview of key models: GPT, BERT, T5, LLaMA, Falcon (Theory) | 19-Jul-25 | 11:45 AM | 12:45 PM | 12:45 - 01:00 PM |
| 2 | Hands-on: • Running a pre-trained LLM (GPT-4, Mistral, LLaMA-2) using Hugging Face. • Exploring embeddings and tokenization. | 26-Jul-25 | 09:00 AM | 11:00 AM | 11:00 - 11:30 AM |
| 2 | Retrieval-Augmented Generation (RAG) (Theory) | 26-Jul-25 | 11:30 AM | 01:00 PM | 01:00 - 01:30 PM |
| 3 | Hands-on: Implementing RAG using LangChain + FAISS / ChromaDB | 02-Aug-25 | 09:00 AM | 10:30 AM | 10:30 - 11:00 AM |
| 3 | Prompt Engineering & Optimization (Theory) | 02-Aug-25 | 11:00 AM | 12:30 PM | 12:30 - 01:00 PM |
| 4 | Hands-on: Experimenting with different prompt strategies in OpenAI GPT | 09-Aug-25 | 09:00 AM | 10:00 AM | 10:00 - 10:30 AM |
| 4 | Generative AI – Text, Image & Code Generation (Theory) [Overview, Diffusion Models: Stable Diffusion and DALL-E, Code Generation: OpenAI Codex, StarCoder] | 09-Aug-25 | 10:30 AM | 12:30 PM | 12:30 - 01:00 PM |
| 5 | Hands-on: • Generating images with Stable Diffusion. • Using OpenAI Codex for automatic code generation. | 23-Aug-25 | 09:00 AM | 10:30 AM | 10:30 - 11:00 AM |
| 5 | LoRA, QLoRA & Fine-Tuning LLMs (Theory) | 23-Aug-25 | 11:00 AM | 12:30 PM | 12:30 - 01:00 PM |
| 6 | Hands-on: • Fine-tuning a LLaMA-2 model using QLoRA on domain-specific data • Evaluating model performance before and after tuning | 30-Aug-25 | 09:00 AM | 11:00 AM | 11:00 - 11:30 AM |
| 6 | Agentic AI, agentic AI architecture, MCP (Model Context Protocol) & AI Agents with LangChain (Theory) | 30-Aug-25 | 11:30 AM | 01:00 PM | 01:00 - 01:30 PM |
| 7 | Hands-on: • Deploying an LLM on Hugging Face Inference API • Running a quantized LLM (4-bit QLoRA) on a local machine | 06-Sep-25 | 09:00 AM | 10:30 AM | 10:30 - 11:00 AM |
| 7 | Ethical AI, Security & Responsible Deployment (Theory) | 06-Sep-25 | 11:00 AM | 12:30 PM | 12:30 - 01:00 PM |
| 8 | Hands-on: • Evaluating AI bias using Explainable AI (XAI) tools • Implementing security measures in an LLM-powered API | 13-Sep-25 | 09:00 AM | 10:30 AM | 10:30 - 11:00 AM |
| 8 | Declaration of capstone project groups, project topics, project submission deadline, and other relevant information. | 13-Sep-25 | 11:00 AM | 12:00 PM | |
| 8 | Closing ceremony | 13-Sep-25 | 12:00 PM | 01:00 PM | |

NOTE: After the end of the course, the participants will undergo a capstone project on topics like fine-tuning an LLM, implementing RAG, or building an AI agent. Each participant will be given a project topic, and they have to do it under an assigned faculty member. At the end, candidates have to submit the project report within a given deadline.