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#6th Ranked (NIRF 2024)



Advanced PG Certificate in

AI Engineering on Cloud and AIOps

By Continuing Education Centre, IIT Roorkee

HYBRID MODE

Ideal for AI Engineers, ML Developers, MLOps Experts, and Cloud-Native Architects

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Message from —
Coordinator, Continuing Education Centre (CEC)

Prof. Kaushik Ghosh is a **Distinguished Academician** and a **Leading Researcher in Bioinorganic and Organometallic Chemistry**. As the **Coordinator of the Continuing Education Centre (CEC) at IIT Roorkee** and a **Professor (HAG) in Department of Chemistry and Joint Faculty Department of Bio Sciences and Bio Engineering IIT Roorkee**, he has been at the forefront of interdisciplinary research, bridging fundamental science with real-world applications.

With expertise in **Bioinorganic Chemistry, Catalysis, and Metal Complexes in Protein Aggregation**, Prof. Ghosh has authored over **130 Research Papers**, contributed to several book chapters, and secured multiple research grants. He is a **Fellow of Royal Society of Chemistry (FRSC)** and his contribution have been recognized with prestigious accolades, including the **DST-SERC Fast Track Award for Young Scientists** and the **ICMR International Fellowship**.

Under his leadership, CEC at IIT Roorkee is driving innovation in continuing education, offering cutting-edge programs that empower professionals and students with industry-relevant expertise.



AI is redefining the future of engineering. From Gen AI to Agentic AI, the ability to harness intelligent systems will be the differentiator for engineers of tomorrow. At IIT Roorkee's CEC, we are committed to equipping learners with the latest advancements in AI, ensuring they stay ahead in this transformative era. The fusion of AI and engineering will not only drive innovation but also shape the next generation of problem-solvers and industry leaders.

PROF. KAUSHIK GHOSH

Coordinator, Continuing Education Centre (CEC), IIT Roorkee

Context of
The Program

Build AI Systems that Actually Scale!

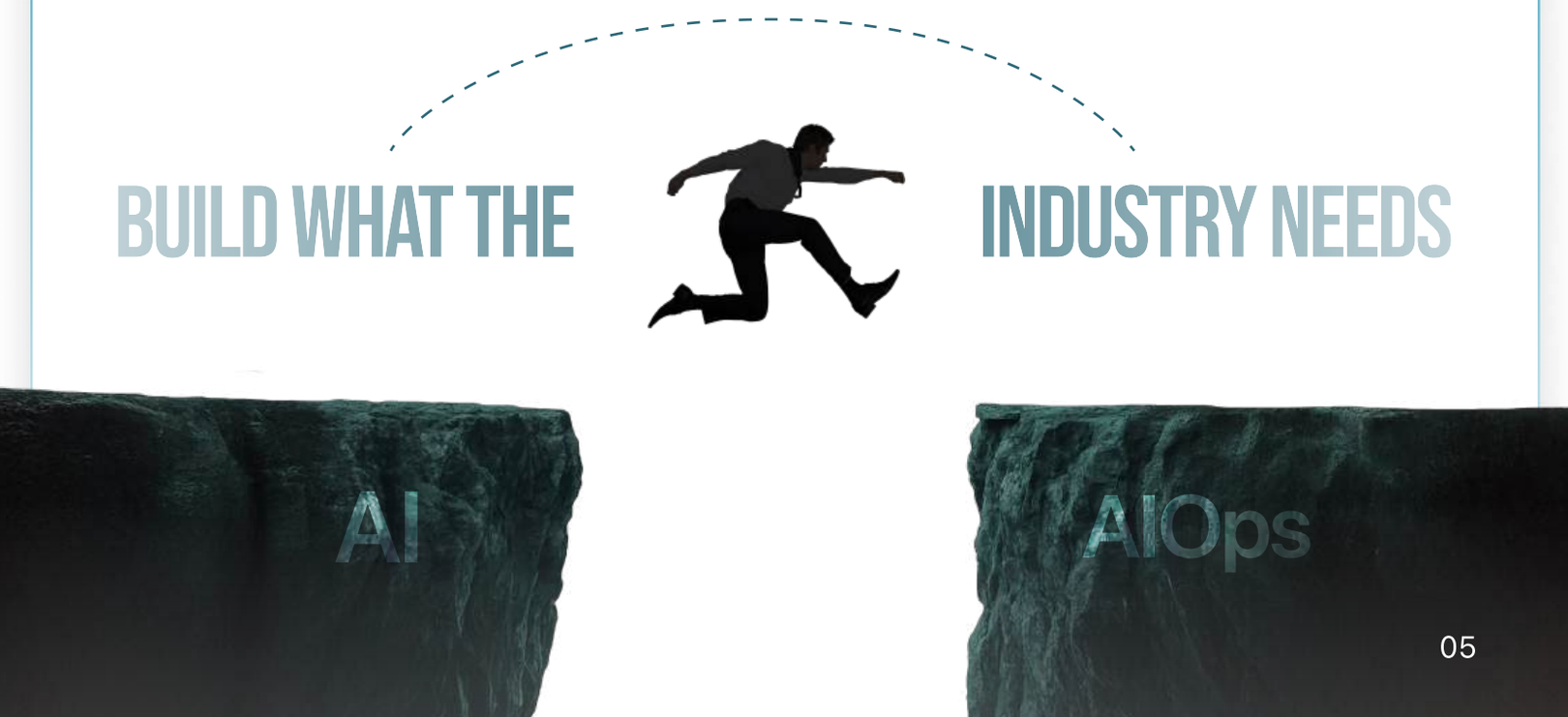
We are no longer in the age of isolated AI experiments. Today, the real impact comes from AI systems that go beyond model-building, into deployment, scaling, and lifecycle management on the cloud. **This is the Era of AI Engineering & AIOps**, where performance, reliability, and continuous learning are the baseline expectations.

From Lab to Real World - This is Where AI Gets Real.

The Shift: From AI Models to AI Infrastructure

Most professionals can build models. Few can engineer full-stack AI systems, systems that handle real-time data ingestion, cloud-native deployment, observability, and rollback under enterprise-grade SLAs. **This program is designed to create those few.**

Be the One Who Makes AI Work in the Real World.



The Failure of GenAI Pilots is a DevOps Problem

Over 90% of GenAI pilots never make it to production.

Why?

Not because the models are bad, but because of weak data pipelines, outdated deployment practices, and a lack of cloud-native AI operations maturity.
This program bridges that production gap, combining AI Development with Cloud Infrastructure and AIOps to train engineers who can ship robust, scalable, and secure AI systems.

Build What Most Can't: AI Systems that Actually Ship

Cloud Is Not an Add-On. It's the Foundation

Modern AI workloads, from multimodal LLMs to predictive systems run on AWS, Azure, and GCP.
This program emphasizes:

- GPU Provisioning & Cost Optimization
- Cloud-native Deployment (Kubernetes, Docker)
- Data Pipeline Orchestration (Airflow, N8n)
- Security, Observability, and Rollback Protocols

Because if your AI isn't cloud-native, it isn't production-ready.

Production AI Starts Where Cloud Fluency Begins

Designed for the Full-Stack AI Engineer

Today's AI teams are shrinking in size, but growing in capability. Employers don't want fragmented teams anymore. They want engineers who can build, deploy, monitor, and scale across the full lifecycle. This program prepares you to be:

- A Cloud-fluent AI Developer
- An MLOps and AIOps Practitioner
- A GenAI & Agentic AI System Builder

What You'll Learn to Build?

End-to-end AI pipelines that go from notebook to API to production

RAG systems and memory orchestration with vector databases

Real-time AI applications with rollback, monitoring, and latency control

Enterprise-grade AI systems, not just prototypes

Autonomous agent architectures, built using tools like LangChain, CrewAI, LlamaIndex

Built for Engineers Who Deliver Value from Day One

This is not a research course. It's a practitioner's program for **Software Engineers**, **MLOps Engineers**, and **Data Engineers** who want to move beyond notebooks and into production environments.

Whether you're scaling fraud detection, deploying intelligent agents, or building AI-native infrastructure, this program equips you to do it at scale, reliably, and independently.
AI Engineering on Cloud & AIOps isn't just about writing models. It's about engineering production-grade intelligence.



About the — Program

ARTIFICIAL INTELLIGENCE

The **Advanced PG Certificate in AI Engineering on Cloud and AIOps by IIT Roorkee is a 9-month Hybrid Program**, a first of its kind, specially designed to **Bridge the Gap between AI Pilot Use-cases and Real-world AI Deployment**.

The program empowers learners to design, build, and deploy full-stack cloud-native GenAI systems, including **Multi-agent Architectures, MLOps Pipelines, and Cloud-native AI Applications**, with a strong emphasis on security, scalability, and business impact.

- 9-month Hybrid Program
- Advanced Certificate
- AI Engineering
- AIOps
- Cloud-Native AI
- Generative AI
- Agentic AI
- MLOps Pipelines
- Full-stack AI Systems
- Production-grade AI
- Security and Scalability
- Cloud Infrastructure
- Campus Immersion
- Futurense Bridge Course

✦ Why Cloud-Native AI, GenAI, and Agentic AI are at the Core of this Program?

Today's AI landscape demands more than just intelligent models; it demands production-ready systems that are **Cloud-native by Design, Scalable, and Autonomously Adaptable**.



This Program is Built for the Real World of AI



Cloud-native Architecture

Cloud-native architecture ensures that AI solutions are elastic, secure, and infrastructure-ready for deployment in the real world across **AWS, Azure, and GCP.**

01



Generative AI

Generative AI tools, such as LLMs and multimodal models, are at the forefront of new product interfaces and internal automation; however, without proper deployment mechanisms, they often remain stuck in prototypes.

02



Agentic AI

Agentic AI systems are fast becoming integral in use cases that demand Continuous Reasoning, Memory Retention, and API Orchestration, Critical for Building Enterprise-grade Autonomy.

03

Rather than focusing solely on model-building, this program equips learners to:

- Build a robust AI infrastructure on the cloud from the ground up
- Integrate hands-on Projects in building GenAI models, agent workflows, & MLOps pipelines seamlessly into live environments
- Design and deploy full-stack systems that are secure and reliable
- Live Interactive sessions with IIT faculty and top industry experts
- Use-Case-Driven Curriculum including real-world examples from finance, compliance, operations, and risk
- Weekend Classes that are designed to accommodate working professionals
- Optional 2-day campus immersion at IIT Roorkee
- Integrated Futurense Bridge Course for technical readiness

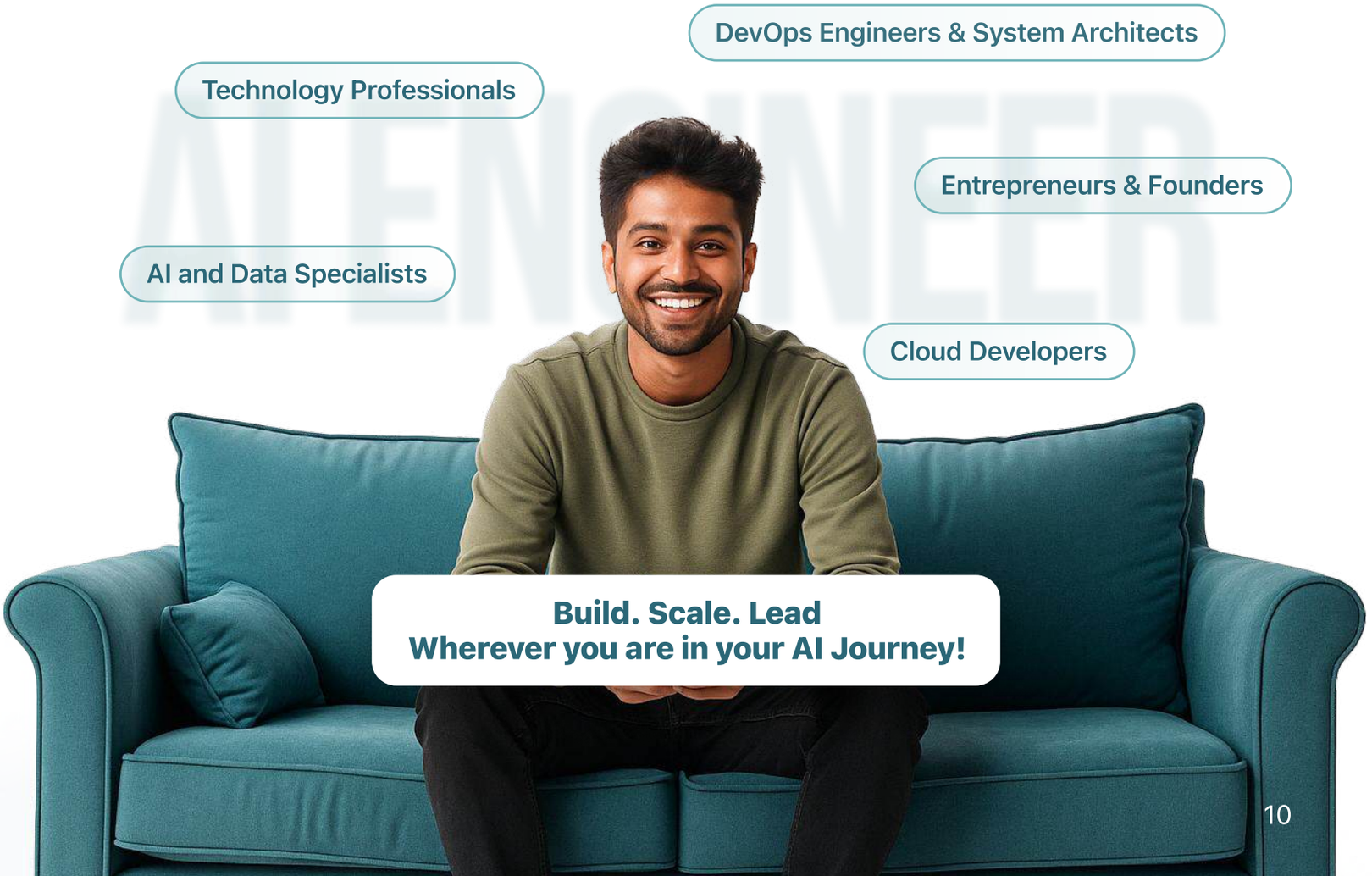
Who is this –

Program for?

Whether you're an experienced engineer or an entrepreneur building the next big thing in AI, this program is built to equip you with the skills to launch, manage, and scale enterprise-ready AI systems on the cloud.

✦ This Certificate is Ideal for:

- **Technology Professionals:** Developers and engineers working on or aspiring to work on cloud native AI apps hands-on, and looking to master end-to-end AI workflows from model design to cloud deployment.
- **Cloud Developers:** Professionals seeking to deepen their knowledge in deploying AI-native solutions in AWS, Azure, or GCP environments.
- **AI and Data Specialists:** Those aiming to shift from analysis and modeling to operationalizing AI with MLOps and Agentic AI stacks.
- **Entrepreneurs & Founders:** Visionaries creating AI-first products and platforms who want hands-on experience in full-stack GenAI system building.
- **DevOps Engineers & System Architects:** Professionals eager to add AI deployment, agent orchestration, and secure pipeline design to their portfolio.



Program – Highlights

What Sets this Program Apart?

This is a complete transformation journey from foundational AI concepts to **Full-scale Deployment of Production-Grade GenAI and Agentic AI Systems**. Each module has been carefully designed to build progressive expertise, supported by IIT Roorkee's academic rigor and Futurense's industry-first application design.

YOUR 8-STEP JOURNEY TO AI MASTERY

- **AI & ML Foundations**
  Learn core concepts + cloud context
- **Cloud for AI**
  AWS, Azure, GCP essentials
- **Deep Learning & NLP**
  CNNs, RNNs, transformers, chatbots
- **Generative AI & LLMs**
  Prompting, prototyping, multimodal tools
- **GenAI Deployment**
  Docker, Kubernetes, scalable infra
- **MLOps & AIOps**
  Versioning, rollback, monitoring
- **Multi-Agent Systems**
  LangChain, n8n, memory-driven agents
- **Capstone Project**
  Build real, cloud-native AI solutions



END-TO-END PROJECT-BASED LEARNING

Work on real-world projects aligned to enterprise-grade use-cases:

- GenAI Document Processors
- AI-Enabled Workflow Automation
- LangChain-based Customer Assistants
- Autonomous Agent Workflows
- Full-stack Cloud AI Deployments

CERTIFICATE FROM CEC IIT ROORKEE

Earn a career-transforming certificate from **India's #6-ranked institute (NIRF 2024)** - a powerful credential for AI engineering roles worldwide.

INDUSTRY-BACKED LEARNING EXPERIENCE

Masterclasses from tech leaders at EY, TCS, Infosys, HCLTech & McKinsey on:

- AI Engineering best practices
- Enterprise AI security
- MLOps & AIOps pipelines
- Agentic AI in production

OPTIONAL 2-DAYS CAMPUS IMMERSION

Spend time at IIT Roorkee engaging with faculty, presenting your final project, and collaborating with fellow learners.

By the End of the Program, you will be equipped to Lead AI Projects and Develop Scalable, Real-world AI Solutions.



Learner journey

01 Apply & Take the Pre-Screening Test

02 Receive admission confirmation & pay fees

03 Begin Futurense Bridge Course

04 Attend weekend live sessions

05 Complete assignments & projects

06 Attend a 2-day optional campus immersion

07 Earn a PG Certificate from CEC IIT Roorkee


Indian Institute of Technology Roorkee
Continuing Education Centre
Certificate
This is to certify that sample name has successfully completed the course on Advanced PG Certification in AI Engineering on Cloud and AIOps organized by Continuing Education Centre, Indian Institute of Technology Roorkee in association with Futurense Technologies during DD-MM-YYYY to DD-MM-YYYY.

Program –

Outcomes

By the end of this program, learners will be equipped with the capabilities to operationalize the product for real-world impact.

Design and implement end-to-end AI and ML workflows

Including data preparation, supervised & unsupervised model training, and evaluation metrics using real-world datasets.

Demonstrate expertise in core ML, deep learning, and NLP

Master neural networks, CNNs, RNNs, and transformers for predictive modeling and text-based AI systems.

Apply advanced Generative AI methods

Use GANs, VAEs, and diffusion models to generate text, images, & data for both synthetic experimentation and creative automation.

Build, fine-tune, and deploy Large Language Models (LLMs)

Use frameworks like Hugging Face, LangChain, & CrewAI to create domain-specific GenAI applications through effective prompt engineering

Develop and manage AI-powered agents and multi-agent systems

Leverage Agentic AI stacks using orchestration tools and retrieval-augmented generation techniques to automate complex workflows.

Deploy AI applications on the cloud

Containerize and scale AI systems using Docker, Kubernetes, AWS, and GCP while maintaining compliance, observability, and uptime.

Operationalize AI through AIOps and MLOps

Ensure retraining, rollback, and versioning of models using pipelines that support continuous learning and monitoring.

Address AI safety, ethics, and governance

Understand the legal and ethical implications of AI and build applications that are secure, responsible, and regulation-ready.

Translate AI into a measurable business impact

Bridge the gap between models & outcomes with solutions that directly improve KPIs across domains like finance, marketing, operations, & product.

Career —
Outcomes

Upgrade to High-Growth & High-Paying Roles in AI Engineering -
Master the Skills to Build, Deploy, and Scale Real-world AI Systems Across Industries.

This program is designed not just to upskill, but to transform your career. For those with existing backgrounds in AI, ML, or data roles, the journey doesn't stop at learning new tools; it's about evolving into autonomous AI leaders.

✦ Role Evolution for Experienced Professionals

Whether you're a Data Scientist, Data Engineer, or MLOps expert, this certificate course helps you transition into next-gen roles

As your skillset expands from prompt engineering and workflow design to LLM optimization and multi-agent orchestration, your career path accelerates toward high-impact leadership roles in cloud-native and production-ready AI systems.

✦ Tools & Platforms Covered

MACHINE LEARNING — scikit-learn, dmlc XGBoost, LightGBM

DEEP LEARNING — PyTorch, TensorFlow, Keras

AGENTIC AI — crewai, Autogen, Semantic Kernel

GENERATIVE AI — Transformers, LLM APIs, Open-Source LLMs

CLOUD — Compute & Hosting, Storage & Datalakes, Serverless & APIs



This Program Prepares You for –

High-demand Job Roles

Current role and upgraded role after CEC IIT Roorkee program

DATA SCIENTIST

Skills

Python, R, SQL, Basic Statistics, Data Visualization

₹4 - 12 LPA

AI ENGINEER WITH GENAI SPECIALIZATION

Upgraded Skills after attending the Program

LLM fine-tuning, Prompt Engineering, LangChain, AutoGen, CrewAI, Agentic Workflow Design, RAG, Vector Databases

₹18 - 35 LPA

MACHINE LEARNING ENGINEER

Current Skills

Python, Basic TensorFlow/PyTorch, Simple Model Training

₹5 - 10 LPA

GENERATIVE AI ENGINEER

Upgraded Skills after attending the Program

Advanced GenAI, LLMs (GPT-4, Cohere), Hugging Face, Diffusion Models, GANs, VAEs, Cloud ML Platforms (AWS SageMaker, Azure ML)

₹20 - 40 LPA

DATA ENGINEER

Current Skills

SQL, Basic ETL, Python, Simple Data Pipelines

₹4 - 8 LPA

AI DATA ENGINEER

Upgraded Skills after attending the Program

Unstructured Data Processing, AI-driven ETL, Real-time Data Streaming, Cloud-native Pipelines (AWS, Azure, GCP), Vector Databases

₹15 - 25 LPA

MLOPS ENGINEER

Current Skills

Basic Docker, Simple CI/CD, Model Deployment

₹6 - 10 LPA

AI SYSTEMS ENGINEER WITH AIOPS

Upgraded Skills after attending the Program

AIOps, Multi-agent Orchestration, Advanced MLOps, Kubernetes, Prometheus, Grafana, Seldon, Evidently AI, Cloud Security

₹22 - 45 LPA

*Note: There is no job guarantee after completing this course, However, career support will be provided by the Futurense. IIT Roorkee will not be responsible for the career support.

DATA ANALYST

Skills

SQL, Excel, Basic Python, Tableau/ PowerBI

₹4 - 8 LPA

AI PRODUCT ANALYST

Upgraded Skills after attending the Program

Comprehensive AI/ML understanding, Business Impact Analysis, Basic GenAI applications, Data-driven insights with AI tools

₹18 - 30 LPA

BUSINESS INTELLIGENCE DEVELOPER

Skills

SQL, Basic ETL, Power BI/Tableau, Data Visualization

₹4 - 7 LPA

CLOUD AI SOLUTIONS DEVELOPER

Upgraded Skills after attending the Program

AI/ML integration, Cloud platforms, Basic system design, Performance optimization, Serverless AI

₹20 - 35 LPA

AI ENGINEER

Skills

Python, Basic ML Algorithms, Simple Neural Networks

₹5 - 12 LPA

AGENTIC AI ENGINEER

Upgraded Skills after attending the Program

Advanced Agentic AI, Multi-agent Systems, Semantic Kernel, Knowledge Base Integration, Production AI Deployment

₹25 - 50 LPA

CLOUD ENGINEER

Skills

Basic AWS/Azure, Simple Deployments, Basic Networking

₹4 - 8 LPA

CLOUD AI ENGINEER

Upgraded Skills after attending the Program

Advanced Cloud AI Services, Serverless AI, Auto-scaling ML Infrastructure, Cost Optimization, AI-native cloud architecture

₹25 - 45 LPA

*Note: There is no job guarantee after completing this course, However, career support will be provided the Futurense. IIT Roorkee will not be responsible for the career support.

Role Evolution for Freshers & 1+ Years of Experience

Make the shift from surface learning to engineering production-grade GenAI systems, hands-on, end-to-end, and built for the real world.

GENERATIVE AI ENGINEER

Skills Required

Advanced GenAI, LLMs (GPT-4, Cohere), Hugging Face, Diffusion Models, GANs, VAEs, Cloud ML Platforms (AWS SageMaker, Azure ML)

₹12 - 30 LPA STARTING SALARY

AI ENGINEER

Skills Required

Python, Machine Learning basics, TensorFlow/PyTorch, LLM fine-tuning, Prompt Engineering, LangChain, AutoGen, CrewAI

₹12 - 25 LPA STARTING SALARY

MACHINE LEARNING ENGINEER

Skills Required

Python, Basic TensorFlow/PyTorch, Model Training, Data Preprocessing, Feature Engineering, Model Evaluation

₹12 - 28 LPA STARTING SALARY

DATA SCIENTIST

Skills Required

Statistical Analysis, Python, R, SQL, Data Visualization, Machine Learning fundamentals

₹12 - 22 LPA STARTING SALARY

AIOPS ENGINEER

Skills Required

Basic Docker, Simple CI/CD, Model Deployment, Kubernetes basics, Prometheus, Grafana, Cloud platforms

₹15 - 35 LPA STARTING SALARY

DATA ANALYST

Skills Required

SQL, Excel, Basic Python, Tableau/PowerBI, Statistical Analysis, Data Visualization

₹12 - 18 LPA STARTING SALARY

AI PRODUCT ANALYST

Skills Required

Comprehensive AI/ML understanding, Business Impact Analysis, Data-driven insights, Product Management basics

₹15 - 30 LPA STARTING SALARY

CLOUD AI ENGINEER

Skills Required

Basic AWS/Azure, Simple Deployments, Cloud Security, Serverless AI, Auto-scaling ML Infrastructure

₹18 - 35 LPA STARTING SALARY

*Disclaimer: Job outcomes vary based on experience, role, employer, location, and market conditions.

Curriculum

Module 1: Foundations of AI, ML, and Generative AI

Topics

- Understanding Supervised Machine Learning, Unsupervised Machine Learning, and Reinforcement Learning
- Data Manipulation for Machine Learning
- Exploratory Data Analysis for Machine Learning
- Essential Mathematics for Machine Learning and AIDefinition of Generative AI
- Generative AI Applications
- Definition of LLMs

Module 2: Deep dive into Machine Learning Algorithms

Topics

- Regression Supervised Machine Learning
  Linear Regression
  Decision Tree Regressor
  Random Forest Regressor
  Overfitting, Underfitting, and Regularization
- Classification Supervised Machine Learning
  Logistic Regression
  Decision Tree Classifier
  Random Forest Classifier
- Unsupervised Machine Learning
  K-Means Clustering
  Hierarchical Clustering
  Dimensionality Reduction
  Anomaly detection
- Understanding Reinforcement learning: Basic concepts (Action, reward, process), MPD, RL, DRL, DQN, etc.
- MLOps for Machine Learning model deployment

Module 3: Understanding Deep Learning

Topics

- Exploring Deep Learning
  Understanding Neural Networks with TensorFlow
- Deep dive into Neural Networks with TensorFlow
- Artificial Neural Networks (ANN)
- Convolutional Neural Networks (CNN)
- Object detection using the YOLO framework
- Transfer Learning in CNN
- Recurrent Neural Networks (RNN) and LSTMs

Module 4: Exploring NLP

Topics

- Architectures of RNN - One to One, Many to Many, Many to One, etc
- Understanding Text for NLP
  Tokenization, Stemming and Lemmatization, Stopwords, and Keywords in NLP
- Text Vectorization using TF-IDF, Bag of Words, and Word 2 Vec
- Use cases across domains in NLP

Module 5: Engaging with Generative AI

Topics

- How Generative AI works
- Text generation, Image generation
- Audio generation and video generation
- Using Hugging face to access models for text generation, image generation
- GANs
  Types of GANs - ProGAN, SRGan, CycleGAN
- Auto Encoders, Variational Auto Encoders (VAEs), Diffusion Models

Module 6: Understanding LLMs

Topics

- Definition of LLMs
  LLM Use Cases
- Prompt Tuning
- Attention Mechanism
- Transformer Model and Architecture
- Encoder-Decoder arrangements
- Train and generate text using
- Encoder-decoder Architecture
- BERT for Transfer learning
- Leveraging multiple pretrained LLMs from Hugging Face
- Fine-tuning LLMs

Module 7: GenAI Application Development Prompting Techniques

Topics

- Introduction to Prompt Engineering
- Successful and Unsuccessful prompts
- Types of Prompting
- Introduction to Open AI, GPT , Open AI Playground
- Cost & latency considerations when calling APIs (OpenAI, Azure, AWS).
- Multimodal prompting for GPT 4
- Image generation using Open AI DALLE 3
- Prompt evaluation
- Implementing Agents and Chains
- Implementing zero-shot-react, conversational-react agents with LangChain
- Open AI Function (Tool Integration)
- Testing various LLMs with Prompt Engineering

Module 8: Synthetic Data and Datasets for LLMs

Topics

- Introduction to Synthetic Data
- Generating Synthetic Data
- Synthetic Data for LLMs
- Real-world Applications and Use Cases
- Hands-on generating and using Synthetic Data

Module 9: AI Embeddings & Retrieval

Topics

- Understanding AI Embeddings
- Advanced Retrieval Techniques
- Hugging Face Embeddings
- Vector Databases in AI
- CRUD operations with Vector Databases
- RAG - Retreival Augmented Generation
- RAG solutions using Open AI models and Hugging face models
- Ethical Considerations in AI Embeddings
- Navigating AI Hallucinations, Drift, and Bias
- Embeddings in Real-world Applications
- Embeddings Optimization and Fine-tuning
- Embeddings Security and Privacy
- LLM Ops and model deployment best practices

Module 10: Understanding Agentic AI

Topics

- Agents, Agentic AI, and Multi-Agent Systems
- Agent Definition & Autonomy
  Simple vs. Knowledge-Based Agents
- Reflex vs. Goal-Driven Agents
  Microsoft AutoGen
- Agent Architecture (Perception, Decision, Action)
- Integrating Knowledge Bases (RAG, Domain Data)
- Measuring Performance (Success Rate, Resource Usage)
- Hierarchical Agent Planning
- Multi-Step Reasoning with LLM
- Memory & Long-Term Context
- Integrating Retrieval Augmentation in Agent Workflows
- Domain-Specific Knowledge & Dynamic Prompting

Module 11: Exploring Cloud Ecosystems

Topics

- Cloud Ecosystems
- Introduction to Cloud Ecosystem
  Definitions
- Cloud characteristics
- Deployment models
- Leading Service providers (AWS, Google, Azure, etc.)
- Comparing AWS, Azure, and GCP core services for compute, storage, and AI/ML.
- Data Centres and their components
- Service (SaaS, IaaS, PaaS)
  Issues & Challenges

Module 12: Advancement in Hypervisors

Topics

- Understanding hypervisors Reference model
- Virtualisation characteristics
- Principles of hypervisor design Interfaces
- Types of hypervisors (type-1 and type-2)
- Differences between Type-1 and Type-2 hypervisors.
- Design methods of hypervisors (full virtualization, para virtualization, and hardware-assisted virtualization)
- Memory Virtualisation
- I/O virtualisation
- OS virtualization
- Comparative Analysis of hypervisors
- Understanding performance, requirements, and bottleneck

Module 13: Container Orchestration

Topics

- Understanding LLM Deployment Architectures
- Containerizing LLM Inference Services (e.g., using FastAPI + Docker)
- Managing GPU Workloads in Kubernetes
- Scaling LLM APIs with Kubernetes and Istio
- Optimizing Latency and Throughput for LLM Containers
- Secure Access and Rate Limiting for AI APIs
- CI/CD for LLM-Powered Microservices
- Monitoring and Logging for LLM Containers
- Model Versioning and Rollbacks
- Cost Optimization Strategies for LLM Inference in Production

Module 14: Cloud Security & Resilience

Topics

- Infrastructure security: Network-level security, Host-level security, Application-level security
- Data security and storage: Data privacy and security issues Jurisdictional issues raised by data location
- Identity and access management
- Access control
- IAM, Key Management Services, and zero-trust architecture
- Trust, reputation, risk
  Authentication in cloud computing
- Client access in the cloud
- Cloud contracting model
- Commercial and business considerations

Module 15: Understanding Cloud in context of Gen AI and LLMs

Topics

- EC2 Deep Dive and AMIs, EBS vs S3 vs EFS – Storage Solutions
- Load Balancing and Auto Scaling Basics
- Intro to Serverless: AWS Lambda
- Using AWS Bedrock for GenAI (including foundation models)
- Deploying Open-Source LLMs on EC2/EKS
- Fine-Tuning and Inference
- Pipelines on Cloud
- Cost & Performance
- Considerations for LLM Workloads
- SageMaker Pipelines for Model
- Training and Inference
- Model Versioning, A/B Testing, and Rollbacks
- Security and Compliance for GenAI in Production

IIT Roorkee –

Campus Immersion

A 2 Days Optional Campus Immersion at IIT Roorkee Provides:

- Expert live masterclass sessions led by esteemed faculty and industry leaders
- Network with peers and leading professionals in the AI and data science fields
- Explore the IIT Roorkee campus, gain access to exclusive labs and workshops, and get project feedback.

Note: A tentative additional fee of approximately ₹10,000 will be applicable, subject to the actual cost incurred. This will be collected separately before the immersion period. Accommodation may be provided either on campus or off campus, depending on the availability of facilities.








*Source of the photographs: IIT Roorkee website, DoMS IIT Roorkee Facebook and Instagram



Program –
Leadership



PROF. NEETESH KUMAR
Associate Professor
Department of Computer Science & Engineering

Dr. Neetesh Kumar brings over a decade of experience at the intersection of **Cloud Computing, DevOps, Parallel Computing, and High-Performance Computing**. He holds a **Ph.D. in Parallel Computing from Jawaharlal Nehru University (JNU), New Delhi, and an M.Tech in Computer Science and Technology**.

As a seasoned academic and industry trainer, Dr. Kumar has **Mentored over 1,000+ Professionals** and held key teaching roles at reputed institutions such as **DTU and IIITM Gwalior**. His ability to simplify complex computing concepts has made him an influential voice in preparing the next generation of technology leaders.

His research received international recognition, including accolades like the **Qualcomm Faculty Award (QFA) 2023, Google CSR Grant**, and multiple Best Paper and Travel Grants from prestigious global conferences.

Prof. Kumar's vision for this program is centered on equipping professionals with real-world expertise in AI engineering and AIOps, ensuring learners not only understand advanced systems but can also operationalize and scale them in industry settings.



Futurense –

Leadership Council

futurense leadership council

Gain access to mentorship and networking opportunities with AI leaders shaping the future of technology.



Nithya Subramanian
Head of Data & Analytics - AMEA
BEST BUY



Pankaj Rai
Group Chief Data and Analytics Officer
ADITYA BIRLA GROUP



Kaushik Das
Managing Director
JCPenney



Anupam Gupta
VP Enterprise Data and Analytics
UNITEDHEALTH GROUP



Tushar Sahu
Director Engineering
Google



Anand Das
Chief digital & AI Officer: Engineering
TVS



Divesh Singla
SVP of Global Operations & DART, Head APAC & Managing Director India & Philippines
SIGNANT HEALTH



Ishu Jain
Head of Analytics
Myntra



Saurabh Agarwal
Chief Executive Officer
DAIOM



Ashish Dabas
Vice President
Capital One



Nitin Srivastava
Data & Analytics India Lead
Dr. Morlene



Shrisha Ray
Director of Engineering
THOMSON REUTERS



A V Rahul
Director, Analytics
Barracuda



Madhu Hosadurga
Global Vice President, Enterprise AI
Schneider Electric



Ankit Mogra
Director - Insights & Analytics
ATHER



Muthumari S
Global Head of Data & AI Studio
brillio



Aditya Khandekar
President
Corridor Platforms



Pankaj Srivastava
SVP - Head of Credit Analysis Unit Offshore
HSBC



Satyakam Mohanty
Founder & Managing Partner
wyser



Saurabh Kumar
Director - Data Engineering
LOWE'S



Sharmistha Chaterjee
EEM- Head of Software and Systems Engineering
CommonwealthBank



Arvind Balasundram
Executive Director, Commercial Insights & Analytics
REGENERON science to medicine



Praveen Sathyadev
Head - EU/ UK Business Growth (VP) - Analytics, Insights and AI
C5i



Anirban Nandi
Head of AI Products & Analytics (Vice President)
Rakuten



Indrani Goswami
Associate Director
NYKAA



Srini Oduru
Head of IT Delivery and Operations
Cervello by AT Kearney



Sumon Mal
Director Engineering
SONY liv



Alok Tiwari
Director Of Analytics
JUNGLEE GAMES



Supria Dhanda
Co-Founder & Managing Partner
wyser



Akshay Kumar
Research & Analytics Leader
Gallagher



Vishal Nagpal
Data Science & Analytics Leader, Trustworthy Shopping Experience
BEST BUY



Monica S Pirgal
Chief Executive Officer
BHARTIYA CONVERGE



Deepa Mahesh
Head of Strategy & Operations, Board Member
Ex- Mu Sigma DO THE MATH



Madhurima Agarwal
Managing Director - Microsoft for Startups
Microsoft



Swati Jain
Partner - Digital, AI & Analytics
Deloitte.



Krithika Muthukrishnan
Chief Data Science Officer
scripbox



Bhargab Dutta
Chief Digital Officer
CENTURYPLY



Tushar Chahal
Chief Technology Officer
Numisma Bank



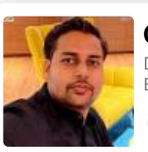
Ruchika Singh
Director , Data Science & Insights
Spotify



Arpit Agarwal
Senior Director, Data Analytics & AI
Google



Sulabh Jain
Chief Analytics Officer
IMPACT ANALYTICS



Gaurav Srivastava
Data Analytics & Engineering Leader
amazon



Aneelkumar Savalagi
Global Chapter Leader - ICSS, Global DD&T
Takeda



Pramod Rawat
Director
WELLS FARGO

& Many More

Futurense –

Bridge Course

Before diving into the rigorous technical curriculum of **IIT Roorkee's Advanced PG Certificate in AI Engineering on Cloud and AIOps**, every learner begins their **journey with the Futurense Bridge Course**. This specially designed foundation module ensures **you're not just ready to learn, but ready to build.**

Whether you're a **data engineer, software developer, or a DevOps professional** transitioning into AI roles, the Bridge Course sets the stage with the **right conceptual clarity, tool fluency, and problem-solving mindset.**

- You don't need to be an **AI expert**
- You don't need **experience deploying LLMs.**
- You just need the **right start**, and that's exactly what this course provides.

✦ What Will You Master in the Bridge Course?

- **GenAI & Agentic AI Fundamentals:** Understand how modern AI systems, from LLMs to autonomous agents, are reshaping operations, workflows, and infrastructure.
- **Prompt Engineering for Engineers:** Go beyond basic prompting: learn how to structure system, context, and user prompts for business-ready outputs using tools like ChatGPT, Claude, and AutoGen.
- **Cloud & AI Workflow Readiness:** Get an introduction to working with AI in cloud-native environments (AWS, GCP, Azure), including basics of containerization and infrastructure setup.
- **Problem Framing & System Thinking in AI:** Learn to convert real-world business and engineering challenges into solvable AI engineering tasks, from building ETL pipelines to designing RAG workflows.

BRIDGE COURSE HIGHLIGHTS

- **60+ Hours** of Structured Pre-Program Learning
- **Hands-On Labs** on Prompting, Tool Stacking, & Workflow Automation
- **Business & Tech Use-Cases** (Ops, Compliance, Finance, SaaS, Support)
- **Personalized AI** Readiness Assessments & Feedback

✦ Why It Matters?

In AI, the Fastest to Deploy Wins

According to a 2025 LinkedIn Workforce Study, roles like **Generative AI Engineer and Agentic AI Developer** have grown **400% YoY**. Companies are no longer experimenting with AI; they're scaling it across entire functions.

The Futurense Bridge Course ensures that when you step into IIT Roorkee's core modules, you're not playing catch-up; you're already building the future.

Eligibility Criteria

- **Minimum 50% in graduation** (Bachelor's degree in STEM: B.Tech/B.Sc./MCA, etc.)
- Preferably **1+ years of professional experience** (qualified freshers may apply if they have completed courses or certifications in AI or data engineering, or Cloud)
- **Exposure to computing or programming** (via coursework, projects, or work)
- **Mandatory pre-screening test** for program readiness

Program details

FORMAT

Hybrid (Live Online + Campus Immersion)

DURATION

9 Months

FEES

₹1.25 Lakhs + GST

SCHEDULE

Saturday & Sunday, 2 Hours Each

START DATE

August 2025

CERTIFICATE

Issued by **CEC IIT Roorkee**

A tentative additional immersion fee of approximately **₹10,000** will be applicable, subject to the actual costs incurred.

Admission process

01 Application

02 Pre-screening Test

03 Fee Payment

04 Start Bridge Course

05 Join Program

About —

IIT Roorkee



The Indian Institute of Technology Roorkee (IIT Roorkee) was established in **1847**, making it one of the oldest technical institutions in India. Originally known as **Thomason College of Civil Engineering**, it became an **IIT in 2001**. IIT Roorkee is renowned for its well-known technological education, research, and innovation, contributing significantly to the advancement of engineering and technology in India and globally.

Spread across a sprawling **365-acre Campus**, IIT Roorkee is equipped with advanced facilities for both academic and research activities. The institute offers a **Multidisciplinary Approach to Education**, with academic programs organized through various departments and cutting-edge research conducted through **Specialized Centers of Excellence**. IIT Roorkee has consistently been at the forefront of technological development and has played a vital role in addressing societal challenges through research and innovation.

IIT Roorkee has been proactively offering **Executive Education Programs Aimed at Working Professionals**. These programs are designed to cater to the dynamic demands of the industry, providing participants with the skills and knowledge required to succeed in their careers. Leveraging its strong academic expertise and collaborations with **Industry Leaders**, IIT Roorkee offers a wide array of **High-quality Programs**, combining theoretical knowledge with practical insights.

The institute maintains robust industry linkages to design customized training and development programs, addressing specific organizational needs. IIT Roorkee boasts modern infrastructure, including **Advanced Classrooms, Well-equipped Laboratories, a Vast Library Collection, and Digital Learning Platforms**, ensuring an immersive and engaging learning experience for all its participants.

About —

Futurense Technologies

Futurense

In today's fast-changing world of deep tech, where skills become outdated overnight, staying ahead means constant evolution.
At Futurense Uni, we offer online degree programs with IITs and IIMs across next-generation domains—delivered with the same rigor as regular degrees and certifications, and carrying the credibility aligned with real-world relevance and hiring trends.
Through Futurense Global Pathways, we enable seamless, cost-efficient transitions to Master's programs across the globe via hybrid models that combine international opportunity with the strength of IIT and IIM certifications.
We are also reshaping core technical education through the Futurense School of AI, embedding AI-first, outcome-driven learning models across private institutions to uplift students with industry-aligned skills and future-ready training.
At the foundation of this ecosystem are the enterprises that power it—informing every curriculum, guiding every standard, and partnering with us to build their future workforce. Whether through tailored skilling, certification programs, or our Hire Train Deploy model that trains talent in our campuses and delivers high-impact teams at scale, every outcome is grounded in real hiring signals and designed to evolve ahead of industry demand. Because India's leadership in deep tech will not come from catching up—it will come from building what's next.

Let's Build what's *Next*-together

Let's get in Touch

IIT ROORKEE

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