



Electronics & ICT Academy
Indian Institute of Technology Guwahati
An Initiative of Ministry of Electronics & Information Technology (Meity)

Duration 6 Months

ADVANCED GENERATIVE AI CERTIFICATION COURSE

Embrace the thrilling future of creativity! Unleash limitless potential with Generative AI, where your imagination collides with groundbreaking innovation in extraordinary ways!





About IIT Guwahati

Indian Institute of Technology Guwahati, the sixth member of the **IIT fraternity**, was established in 1994. The academic programme of IIT Guwahati commenced in 1995. At present the Institute has eleven departments and three inter-disciplinary academic centres covering all the major engineering, science and humanities disciplines, offering BTech, BDes, MA, MDes, MTech, MSc and PhD programmes. Within a short period of time, **IIT Guwahati** has been able to build up world class infrastructure and a reputation for itself.

About E&ICT Academy IIT Guwahati

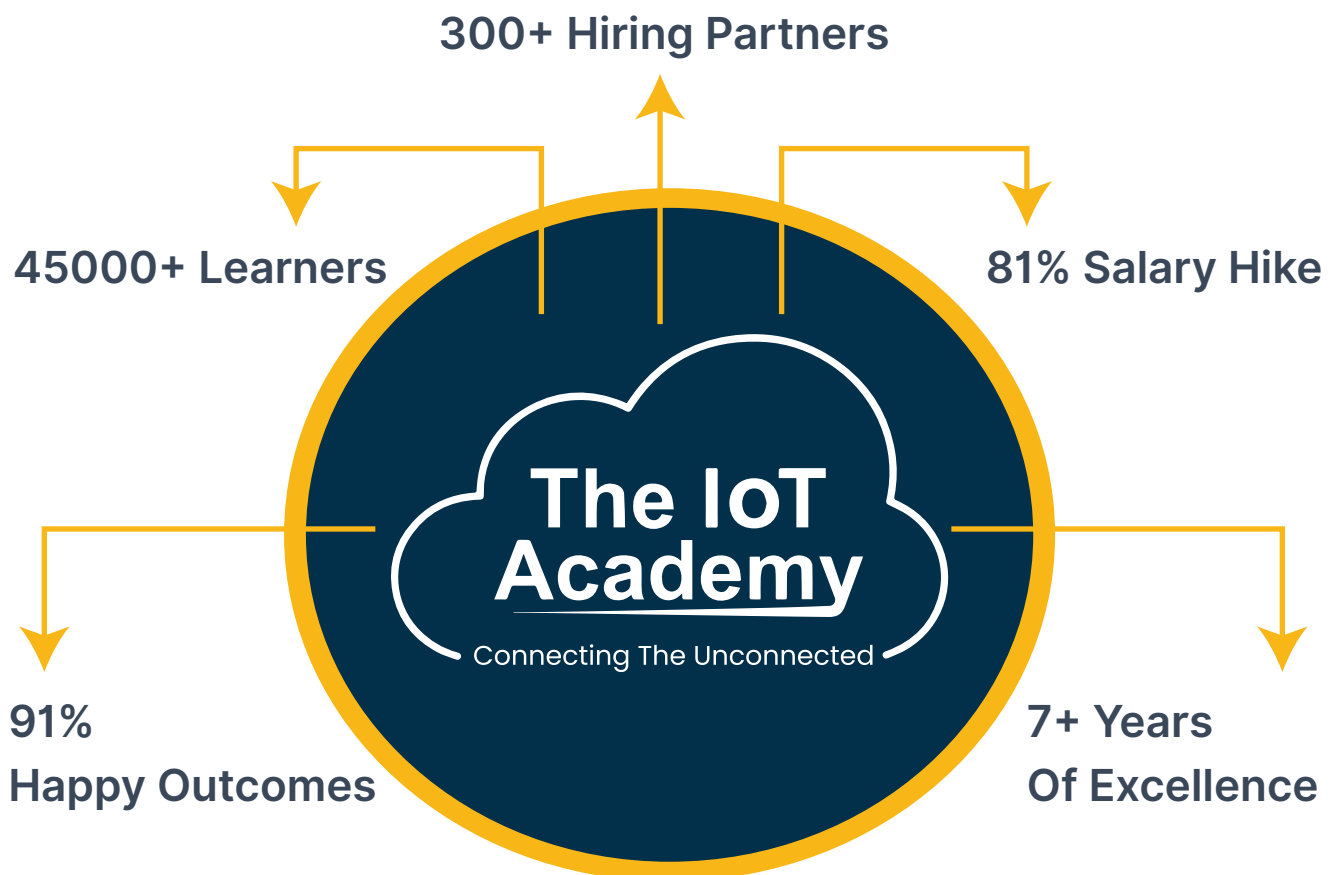
Electronics and ICT Academy aims to provide specialized training to the faculties of Engineering, Arts, Commerce, Science colleges and Polytechnics institutes by developing short term training programmes on fundamental and advanced topics in IT, Electronics & Communication, Product Design, Manufacturing. In addition, the Academy conducts specialized customized training programmes and research promotion workshops for corporate sector & educational institutions

About The IoT Academy

The IoT Academy, established in 2017 is a fast emerging company imparting quality programs for skills training, internship and guidance in cutting edge technologies like **Data Science, Machine Learning, Artificial Intelligence, Internet of Things, Embedded Systems & many more** and focused on helping people develop the skills they need to thrive in the rapidly growing digital economy.

The IoT Academy has collaborated with various premier institutes e.g. **EICT Academy, IIT-Guwahati, IIT-Roorkee and IIT-Kanpur** for **Advance Certification courses** to take provide outcome-centric solutions to help them achieve their professional goals.

“Empowering learners to discover, innovate, and create brighter futures through transformative education.”



About The Program

Dive into the dynamic world of Generative AI, the cutting-edge field shaping industries and revolutionizing innovation. This comprehensive course equips you with the skills to design, implement, and optimize generative AI models, while exploring their vast applications across domains such as art, healthcare, finance, and entertainment.

Key Highlights

Understanding Generative AI:



Learn the fundamentals of neural networks, GANs (Generative Adversarial Networks), VAEs (Variational Autoencoders), and transformer-based models like GPT.

Practical Applications:



Hands-on projects in text generation, image synthesis, music composition, and beyond.

Industry Trends:



Analyze real-world use cases of Generative AI in major companies like OpenAI, Google DeepMind, and Adobe.

Ethics and Policy:



Navigate the challenges of bias, intellectual property, and AI governance.

Why Choose Generative AI Now?

Market Growth:



The global generative AI market is projected to grow at a CAGR of over 30% between 2024 and 2030, expected to surpass \$100 billion by the end of the decade.

Job Demand:



Demand for AI and ML professionals is at an all-time high, with generative AI roles seeing a surge of over 80% in job postings over the past year.

Future Readiness:

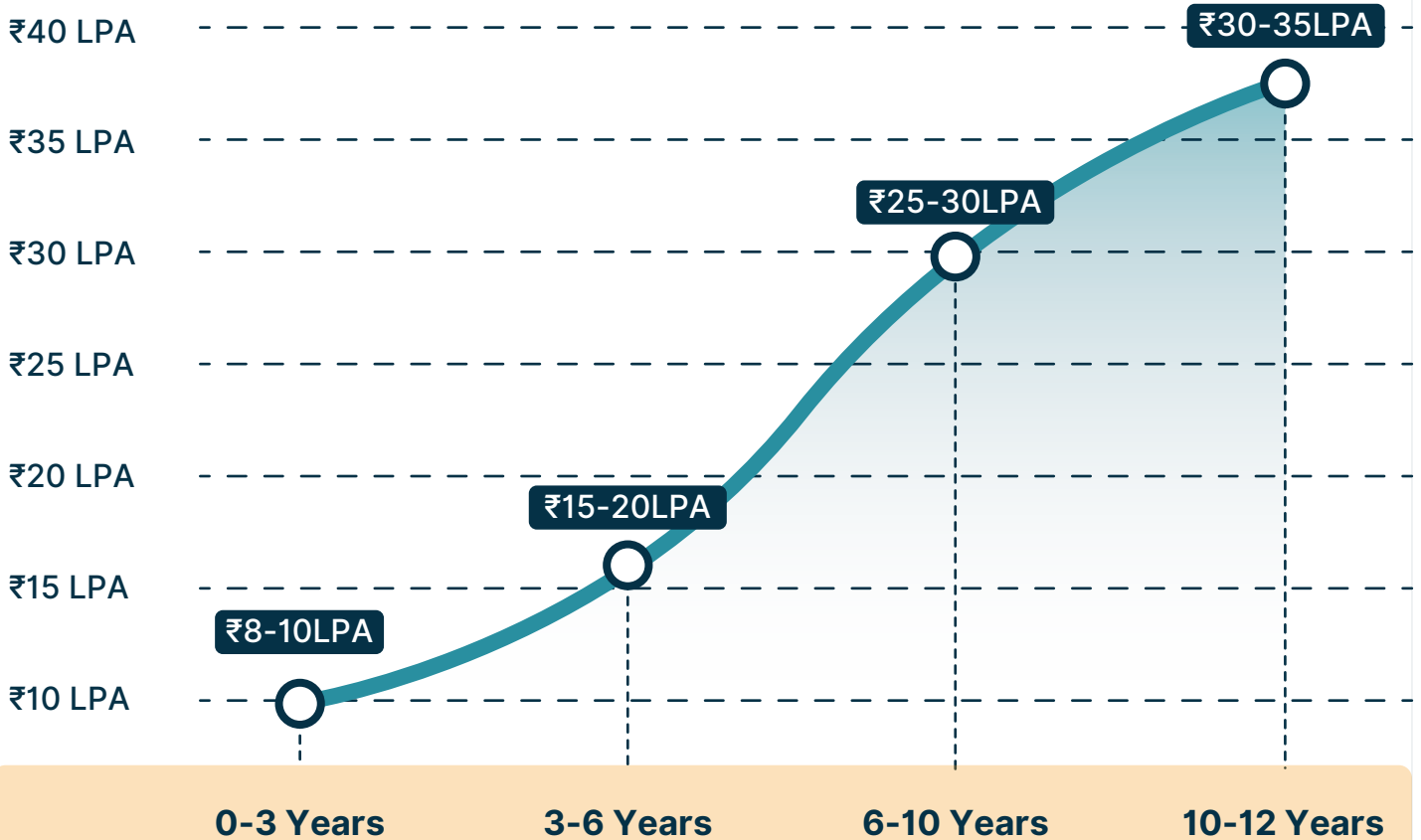


Generative AI skills are now essential for careers in data science, AI research, software development, creative industries, and more.

Whether you're an aspiring data scientist, a creative professional, or an entrepreneur, this course prepares you to harness the transformative power of generative AI and stay ahead in an evolving technological landscape.

Salary & Scope

Median Salary of Generative AI Professionals Across Years of Experience in India



Role/Category	Salary Range	Additional Notes
Large Companies (Senior Roles)	INR 1 crore+ annually	High-end salaries for experienced professionals.
Startups & Mid-size Firms	INR 30-40 lakh per annum	Varies based on experience
Indian IT Companies (Entry Level)	INR 3-4 lakh per annum	Entry-level for freshers; among the lowest in the industry.

Role/Category	Salary Range	Additional Notes
Generative AI Developers at Accenture	INR 8.5 lakh per annum	Compared to INR 5-6 lakh for regular software engineers.
Non-Tech Generative AI Consultants	INR 21-35 lakh per annum	Base salary starts at INR 21 lakh; higher salaries for experienced professionals.
AI Engineers at Google	Average: INR 10.7 crore	Starting salary: INR 12 LPA; can go up to INR 21.2 crore per annum.
GenAI Startups	INR 8-24 lakh per annum	Depending on experience and skill set.
ML Engineers at Startups	INR 30-40 lakh per annum	Good ML engineers typically earn above SWE-level salaries.
Mid-Career GCC Professionals	INR 15-35 lakh per annum	Requires 3-8 years of experience.
Median Salary (Gen. AI Professionals)	INR 15.6 lakh per annum	Skillset plays a crucial role
Median Salary (Gen. AI Developers)	INR 11.1 lakh per annum	Higher than median data analytics roles.
Median Salary (Gen. AI Engineers)	INR 12.5 lakh per annum	Higher than most engineer roles

Track Curriculum



Module 1 Module 2 Module 3 Module 4 Module 5 Module 6 Course 7
Module 8 Module 9 Module 10 Module 11

Introduction to AI and Generative AI

- Overview of AI: Supervised, unsupervised, and reinforcement learning.
- Generative AI: Key concepts, history, and applications in NLP, vision, and audio.
- Ethical considerations and responsible AI development.



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Programming Essentials

- Python programming basics and libraries (NumPy, Pandas, Matplotlib).
- Introduction to PyTorch and TensorFlow.



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Mathematics and Statistics

Linear Algebra

- **Vectors:** Quantities with magnitude and direction, crucial in representing data.
- **Matrices:** Understanding rectangular arrays for data transformation.
- **Eigenvalues and Eigenvectors:** Concepts for understanding stability and data transformations.

Calculus

- **Derivatives:** Learn the rate of change for optimization in AI models.
- **Integrals:** Explore the accumulation of quantities and probability-related calculations.
- **Multivariable Calculus:** Grasp functions with multiple dimensions, critical in generative models.

Probability and Statistics

- **Probability Distributions:** Binomial, Poisson, Normal, Exponential, and more.
- **Statistical Concepts:** Hypothesis testing, correlation, regression analysis, and variance.



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Machine Learning Fundamentals

Supervised and Unsupervised Learning

Learn algorithms like linear regression, decision trees, clustering, and dimensionality reduction.

Model Evaluation and Optimization

Training, validation, and testing.

Address overfitting, underfitting, bias, and variance trade-offs.

Reinforcement Learning

Train agents using policy and value-based methods to understand environmental interactions.



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Deep Learning Fundamentals

Neural Networks

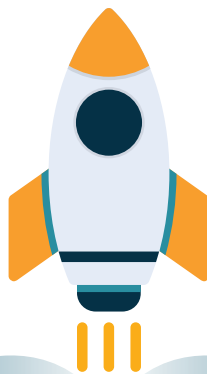
Feedforward and Backpropagation: The foundation of learning in neural networks.
Activation Functions: Use non-linear functions like ReLU, Sigmoid, and Tanh.

Optimization Algorithms

Understand techniques like gradient descent, momentum, Adam, and RMSprop.

Hands-On Implementation

Build neural network models with TensorFlow and PyTorch.





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Computer Vision (CV)

Image Processing Basics

Learn image transformations, filtering, and edge detection using OpenCV.

Convolutional Neural Networks (CNNs)

Architectures: LeNet, AlexNet, VGG, ResNet, and their evolution.

Feature Extraction: Use convolution and pooling layers for real-world applications.

Projects

Apply CV knowledge to tasks like object detection, facial recognition, and segmentation.



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Natural Language Processing (NLP)

Text Preprocessing and Tokenization

Understand text processing with tools like NLTK and spaCy.

Word Embeddings

Build word representations using Word2Vec, GloVe, and FastText.

Recurrent Neural Networks (RNNs) and Transformers

Learn advanced architectures like LSTMs, GRUs, and Transformers for sequence modeling.

Hands-On NLP Applications

Projects include sentiment analysis, chatbots, text generation, and summarization.



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Generative AI: Foundations and Applications

Generative Adversarial Networks (GANs)

Generator and Discriminator: Understand their interaction for adversarial training.

Loss Functions: Minimax game and optimization techniques.

Hands-On Projects: Image synthesis and enhancement with basic GANs.

Variational Autoencoders (VAEs)

Concepts: Understand probabilistic generative models and latent spaces.

Mathematical Foundations: Learn how probability distributions drive data generation.

Applications: Work on projects like image generation and latent space exploration.

Diffusion Models

Explore cutting-edge generative techniques for noise-based data generation.



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Advanced Generative AI with Large Language Models (LLMs)

Understanding LLM Architecture

Transformer Foundations: Attention mechanisms and the Transformer backbone.
GPT Architecture: Learn about layers, embedding, and pre-training concepts.

Pre-training and Fine-tuning

Pre-train on vast corpora for language understanding.
Fine-tune models for domain-specific tasks and applications.

Implementing LLMs

Perform tasks like language translation, text generation, and chatbot development.
Explore real-world applications in sentiment analysis, code generation, and summarization.

Ethical Considerations

Address biases, responsible AI use, and fairness in model applications.



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Exploring Generative Image Applications

Art Generation

Use generative models for creating unique artwork and style transfer.

Image-to-Image Translation

Learn domain-specific transformations like day-to-night or sketch-to-image.

Text-to-Image Synthesis

Combine NLP and CV to generate realistic images from textual descriptions.

Interactive Creative Tools

Build interactive applications for user-driven creative outputs.



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Fine-Tuning Large Models for Domain-Specific Applications

Data Preparation and Cleaning

Curate datasets and pre-process for effective training.

Fine-Tuning Strategies

Use transfer learning to adapt LLMs to specific domains.

Monitor performance using metrics like BLEU, ROUGE, and perplexity.

Deployment and Scalability

Learning Outcomes

Core Knowledge



Understanding Generative AI

- Gain a solid foundation in generative AI principles and its applications.
- Learn the differences between generative and discriminative models.

Applications of Generative AI

- Explore real-world applications, such as image synthesis, text generation, video creation, music composition, and style transfer.

Types of Generative Models

- Understand and implement key generative AI models like GANs, VAEs, Diffusion Models, and Transformer-based architectures (e.g., GPT).

Technical Skills



Model Development

- Learn to build, train, and fine-tune generative models using frameworks like TensorFlow or PyTorch.

Data Handling

- Understand data preprocessing, augmentation, and managing large datasets for training generative models.

Model Evaluation

- Master metrics and techniques to evaluate generative models' performance (e.g., FID, BLEU, or perplexity).

Problem-Solving and Creativity



Innovative Solutions

- Leverage generative AI to solve creative and complex problems in fields like gaming, marketing, and product design.

Ethical and Responsible AI

- Address ethical challenges such as bias, misuse, and implications of AI-generated content.

Practical Implementation



Deployment of Generative Models

- Learn techniques to deploy and scale generative AI solutions in real-world scenarios.

Hands-On Projects

- Gain experience through projects like creating chatbots, generating realistic images, or synthesizing audio.

Future Readiness



Stay Updated

- Be equipped to understand advancements in generative AI, including new model architectures and techniques.

Career Opportunities

- Open pathways to careers in AI research, machine learning engineering, creative technology, and innovation design.

Who can do this course?

Here's a list of who might benefit from or be eligible to take a **Generative AI course**:



Students and Academics

- Computer science or engineering students.
- Researchers in AI, machine learning, or related fields.
- Those pursuing postgraduate studies in AI or data science.

Tech Professionals

- Software developers looking to integrate AI tools.
- Data scientists and analysts.
- AI/ML engineers seeking to deepen their expertise.
- IT professionals exploring AI applications.

Business Professionals

- Entrepreneurs leveraging AI for startups.
- Product managers in tech-driven companies.
- Business analysts interested in AI-driven insights.

Creative Professionals

- Digital artists exploring AI-generated art or design.
- Writers and content creators interested in AI-driven tools.
- Game developers using AI for design and storytelling.

Industry-Specific Professionals

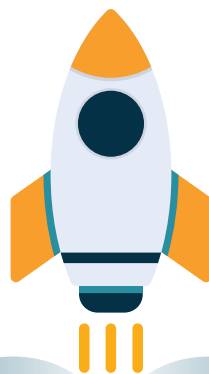
- Software developers looking to integrate AI tools.
- Data scientists and analysts.
- AI/ML engineers seeking to deepen their expertise.
- IT professionals exploring AI applications.

General Enthusiasts

- Anyone passionate about AI and its creative potential.
- Hobbyists who enjoy exploring cutting-edge technology.

Prerequisite Knowledge

- Familiarity with programming (Python is common).
- Basic understanding of machine learning concepts is often recommended.



Placement Statistics

Average Salary

9LPA

Average Hike

60%

89%

Placement Ratio

45%

Career Transition

55%

Fresher Students

Corporates Who Hired form Us



ORACLE



accenture



Honeywell



WNS

Infosys

Deloitte.



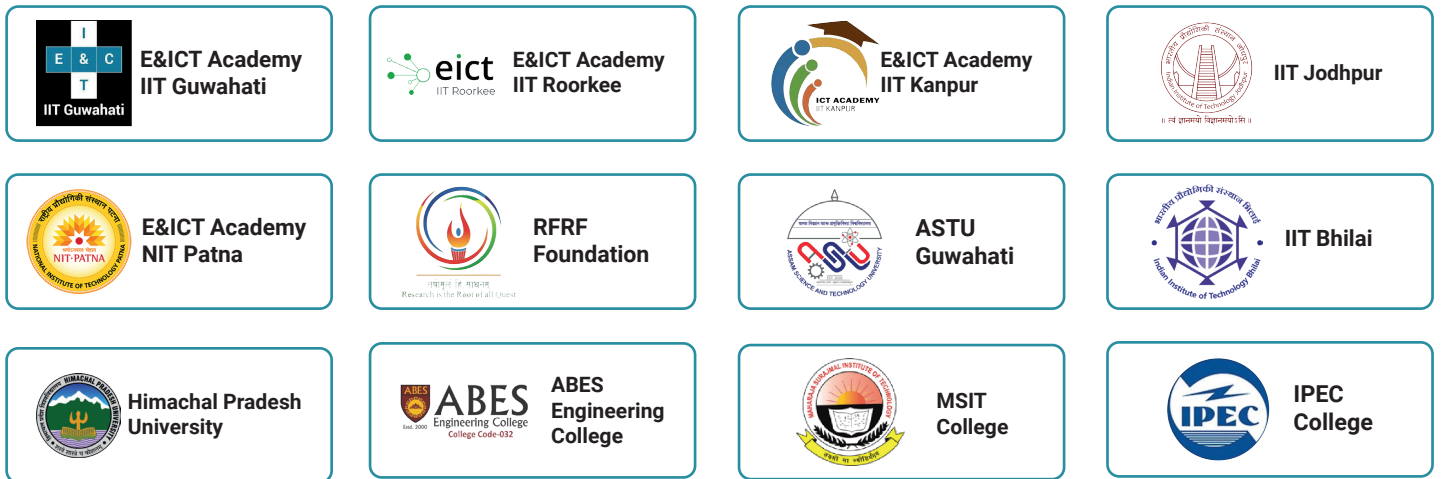
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300+ Partner Companies

Our Academic Partners



Certificate

 Certification ID: TIARG082100409 

Electronics & ICT Academy
Supported by Ministry of Electronics and Information Technology (Meity), Govt. of India
Indian Institute of Technology, Guwahati

CERTIFICATE OF COMPLETION

This is to certify that Mr./Ms.

Name

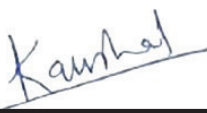
has successfully completed the

Advanced Generative AI Certification Course

organized by Electronics & ICT Academy Indian Insitute of Technology, Guwahati

This is an online certification programme conducted jointly by E&ICT Academy, IIT Guwahati and The IoT Academy towards upskilling.

XX-XX-XXXX
_____ Date


_____ Kaushendra Singh Sisodia
Chief Mentor, The IoT Academy
Director, Uniconverge Technologies

What Our Learners Say About Us

Abhinav



An exceptional hands-on experience! The Applied Data Science course by The IoT Academy in collaboration with IITG provided me with good project exposure that truly prepared me for the industry. With expert guidance and a collaborative community.

Raghvendra Tiwari



The digital marketing course really impressed me! It taught me about search engine optimization (SEO), social media strategies, and how to analyze data giving me the tools I need to help any brand succeed online. This course is perfect for marketers at any level!

Deep Acharjee



I completed a 45-day industrial internship with IoT Academy in an online format. The entire team at the academy was exceptional. Additionally, the sales team provided all the necessary information and support to ensure the smooth operation of my internship throughout its duration. Sir Devesh, an outstanding faculty member, offered in-depth technical insights into embedded systems and IoT, addressing all of my queries. I am deeply grateful to the entire IoT Academy team for their assistance and guidance.

Ajitesh Rana



I recently had the pleasure of enrolling in IoT and Python courses at The IoT Academy, and I am genuinely impressed with the quality and depth of the content offered. From start to finish, the experience was nothing short of exceptional. The IoT Academy's IoT and Python courses exceeded my expectations on all fronts. If you're looking to gain a solid understanding of IoT concepts and harness the power of Python in IoT applications, I wholeheartedly recommend enrolling in their courses.

Vitoka H Sema



It's a very informative and practical place to learn. The I highly recommend others looking for a course in IoT and Embedded system and even other courses the faculties are very friendly and fun loving and their way of teaching is very practical. I learned a lot of new things.

Ankit Kumar



A wonderful learning experience with the lot academy, everything is good from curriculum to trainers so supportive.

What Our Learners Say About Us

Sana Tasneem



The IoT Academy provided a wonderful learning platform and experience for the students, taught by an amazing faculty. Every topic was covered thoroughly and made easy for students to understand.

RAVI KASAUDHAN



It's the best platform of learning The IoT Academy, You can easily learn online Internet of things Follow their official site & also you can follow on Instagram and LinkedIn

Mayank Bhandari



I think the experience with IoT Academy was amazing. I was provided with current problem of COVID-19 and was asked to visualize and predict the scenario, which i really loved to work upon, and meantime learned a lot during doing that. I even got certificate after successful completion of work. So at the end, i will just say i enjoyed it.

Anmol Pruthi



I was not sure about doing the Java course but when I joined the IoT Academy, I saw a great change in myself. I was getting more eager to learn everything from the trainer. The best atmosphere I have seen of learning is at The IoT Academy. If you want to get best out of you Join the IoT Academy.

Goldie Behl



I had a great time doing this course and everyone involved in The IoT Academy has made it a great experience. I have been recommending you to everyone I know. Thank you for all the assistance and feedback, it has been delightful and very gratifying.

Harshita Mahanta



The training was really awesome, it helped me to gain new knowledge not only about IoT but also about the importance of programming. The experts, guides, mentors all were very supportive and provided much valuable advices. The contents that were provided included all the necessary things and really helped me to learn something new.



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Unleash boundless possibilities with Generative AI, where imagination meets innovation effortlessly.

Advanced **Generative AI Certification Course**

By E&ICT Academy IIT Guwahati

HEAD OFFICE C-56/11, Ground Floor, Sector-62 Noida, Uttar Pradesh

TRAINING CENTRE C- 56/12, 3rd Floor, Sector 62 Noida, Uttar Pradesh

