



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



इलेक्ट्रॉनिक्स एवं
सूचना प्रौद्योगिकी मंत्रालय
MINISTRY OF
ELECTRONICS AND
INFORMATION TECHNOLOGY

Professional Certificate in **Applied AI and Machine Learning**



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About the Program

The AI market in India is projected to grow at ~25-35% CAGR until 2027, driven by a robust AI talent pool and significant investments in the sector. This growth is driving advancements across various industries, enhancing content creation, refining product designs, and elevating customer service. AI is also enabling personalized marketing, accelerating innovation, and providing sophisticated virtual assistance.

Our Professional Certificate in Applied AI and Machine Learning offers a comprehensive learning experience in this rapidly growing field. Led by industry experts through live virtual classes and hands-on projects, the program equips you with industry-relevant skills. The curriculum covers essential AI and ML topics, from foundational Python programming to advanced data science, machine learning, deep learning, natural language processing, and speech recognition. Engaging in practical projects with access to integrated labs will prepare you to tackle real-world challenges effectively.

Upon completing the program, you'll gain access to Simplilearn's Career Assistance Services, including expert resume crafting and personalized interview coaching, designed to elevate your career to new heights.



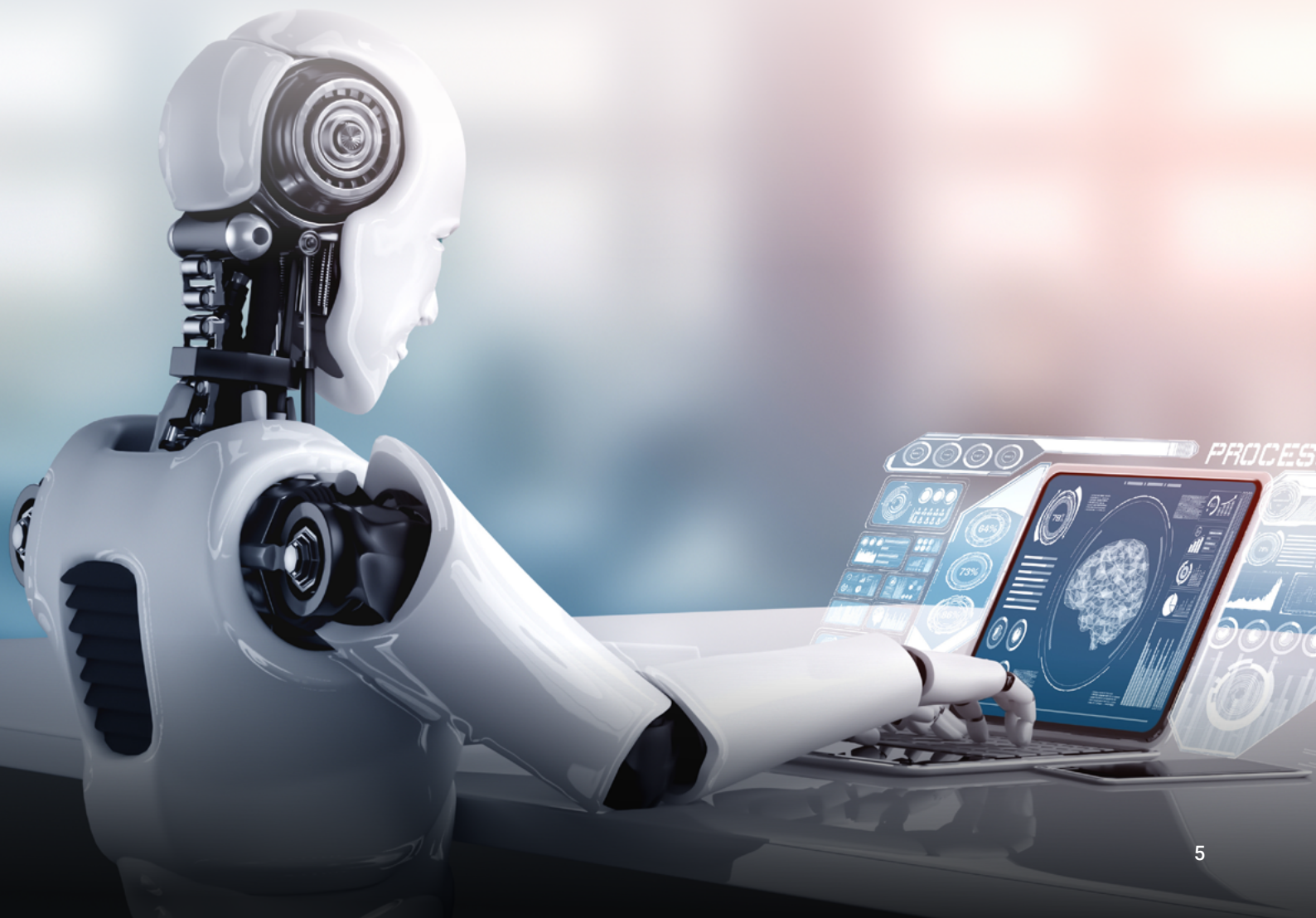
About Electronics & ICT Academy, IIT Guwahati

As an initiative of the Ministry of Electronics & Information Technology (MeitY), the Electronics & ICT Academy was set up at the Indian Institute of Technology Guwahati (IIT Guwahati) under the scheme of “Financial Assistance for setting up Electronics and ICT Academies.” On 26 March 2015, the project started at IIT Guwahati and the academy was inaugurated by Prime Minister Shri. Narendra Modi on 19 January 2016. The objective of the academy is to provide skill training to the Faculty Members (engineering & non-engineering) in the area of recent trends in engineering & ICT applications. The academy is designing specialized modules for imparting quality training for enhancing employability and capacity building in the field of Electronics & ICT. In the past 7 years, the academy has successfully conducted 400+ programs through conventional classroom teaching and virtual classroom mode in different institutes/universities of north eastern states, particularly in other states of India. To date, the academy has successfully trained 20,000+ participants. The academy has also signed an MoU with institutes/universities to host the programs and conduct hands-on sessions. The academy collaborated with industries as training/industry partners. The academy also offers online advanced certification courses in data science, artificial intelligence & machine learning, big data, cloud computing, full stack development, UI/UX, and VLSI design, and trained 2,000+ graduates and working professionals. The academy has also trained 140+ Assam Police and Indian Navy officials on cybercrime concepts and data science.



About Simplilearn

Simplilearn is the world's #1 online certificate program provider, enabling learners around the globe with rigorous and highly specialized training offered in partnership with world-renowned universities and leading corporations. We focus on emerging technologies and skills, such as data science, cloud computing, programming, and more, that are transforming the global economy. Our hands-on and immersive training includes live virtual classes, integrated labs and projects, 24x7 support, and a collaborative learning environment. Over two million professionals and 2000 corporate training organizations across 150 countries have harnessed our award-winning programs to achieve their career and business goals.



Key Features of the Program



Receive a program completion certificate from E&ICT Academy, IIT Guwahati



Earn the opportunity for 'Executive Alumni Status' from E&ICT Academy, IIT Guwahati



Experience a curriculum delivered in live virtual classes by seasoned industry experts



Engage in practical learning through 145+ hands-on exercises and 13 industry-oriented projects



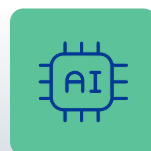
Participate in interactive live-virtual masterclasses delivered by esteemed IIT Guwahati faculty



Leverage Simplilearn's JobAssist to get noticed by top hiring companies



Gain exposure to advanced concepts in data science, machine learning, deep learning, NLP, speech recognition, and prompt engineering



Explore 15+ modern AI tools and packages, including ChatGPT, Gemini, Claude, Uizard, MIRO, Zapier, Julius.ai, Otter, Python, TensorFlow, Keras, Numpy, and more



Eligibility Criteria

For admission to this Applied AI and Machine Learning program, candidates should have:

- ✓ A bachelor's degree with an average of 50% or higher marks
- ✓ Basic understanding of mathematics and programming concepts
- ✓ Preferably, 2+ years of formal work experience

Application Process

The application process consists of three simple steps:



Talk to an Admissions Counselor

Our dedicated admissions counselors are ready to assist with any questions or concerns you may have about this program.

Our team is available to:

- ✔ Guide you through the application process
- ✔ Discuss financing options
- ✔ Offer detailed insights into the curriculum, program outcomes, and more

Inquire Now

Contact Us | 1-800-212-7688



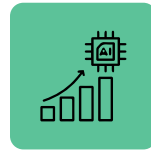
AI ML Industry Trends



\$15.7 trillion

Expected Total
Contribution of AI to the
Global Economy By 2030

Source: PwC Global



\$17 billion

Projected value of India's AI
market by 2027, expanding
at a CAGR of 25-35%

Source: BCG



67%

YoY growth of AI engineer
positions in India

Source: BCG



₹13,50,000

Average annual salary of an
AI/ML engineer in India

Source: Glassdoor

Who is this Program Ideal for?

This program is designed for professionals from various backgrounds and industries who are eager to enhance their skills in generative AI and machine learning.

By bringing together individuals from different fields, the program fosters a dynamic learning environment enriched by diverse perspectives. It is ideally suited for, but not limited to, individuals pursuing or currently employed in the following roles:

- ✓ IT
- ✓ Software Engineering
- ✓ Consulting
- ✓ Analysis
- ✓ Development
- ✓ Product Management
- ✓ AI and ML

Learning Outcomes



Proficiency in Python programming and data manipulation with NumPy and Pandas.



Expertise in data visualization using Matplotlib, Seaborn, Plotly, and Bokeh.



Mastery of supervised and unsupervised learning methods, including regression, classification, clustering, and ensemble techniques.



Skills in building and optimizing deep neural networks with TensorFlow and Keras, and applying transformer models for NLP.



Expertise in prompt engineering and mastering ChatGPT's capabilities and applications.



Competence in text preprocessing, classification, sentiment analysis, and developing machine translation systems.

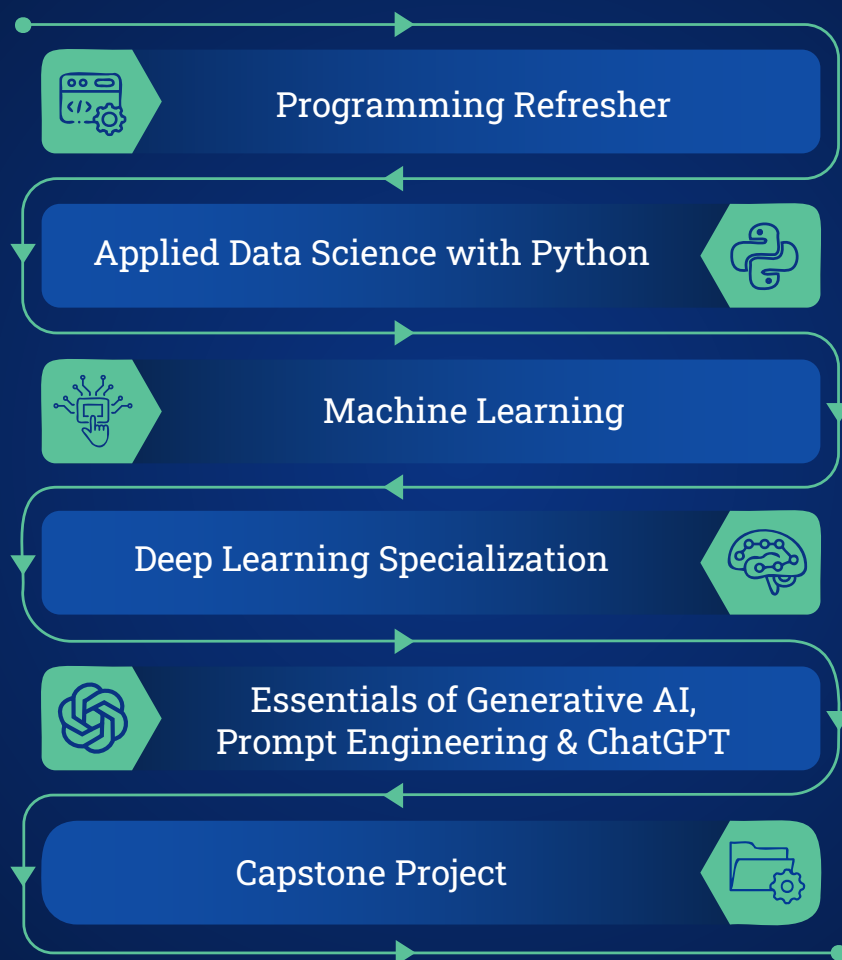


Ability to build deep learning models for speech recognition and apply NLP models like BERT and GPT.



Learning Path Visualization

Core Topics



Elective Courses

- NLP and Speech Recognition
- Academic Masterclass

Core Courses

Module 1

Programming Refresher

This module is designed to equip you with essential programming skills, focusing on Python. It provides a comprehensive introduction to software concepts, programming basics, and Python-specific functionalities. The module ensures that you build a solid foundation in Python programming, setting the stage for more advanced topics.

Learning Outcomes

- Gain proficiency in Python programming, covering installation, syntax, and basic constructs.
- Master Python data types, operators, conditional statements, and loops.
- Develop skills in creating and using Python functions.
- Understand and apply Object-Oriented Programming (OOP) concepts in Python.
- Learn threading and multithreading concepts and their implementation in Python.

Module 2

Applied Data Science with Python

This module is designed to provide you with a comprehensive foundation in data science concepts, tools, and techniques. It covers the entire data science process, including data manipulation, visualization, and statistical analysis, using Python and its powerful libraries. This module ensures you are well-prepared to handle real-world data science challenges and projects.

Learning Outcomes

- Develop a comprehensive understanding of the data science process and its components.
- Acquire skills in data wrangling and preprocessing techniques.
- Master the use of NumPy and Pandas for data manipulation and analysis.
- Construct visually appealing and informative graphs using Matplotlib, Seaborn, Plotly, and Bokeh.
- Gain proficiency in using Python and its libraries for data science applications.

Module 3

Machine Learning

This module provides an in-depth exploration of fundamental and advanced concepts in machine learning. It covers a wide range of topics, from supervised and unsupervised learning to ensemble methods and recommender systems. It equips you with the skills to apply machine learning algorithms and techniques to solve complex real-world problems using tools and packages in Python.

Learning Outcomes

- Develop a comprehensive understanding of machine learning principles and applications.
- Gain proficiency in implementing supervised learning algorithms for classification and regression.
- Master advanced regression techniques and their applications.
- Develop recommender systems using various filtering methods.
- Construct and evaluate classification models and understand their performance metrics.
- Acquire expertise in unsupervised learning methods and clustering techniques.
- Understand ensemble learning techniques to improve model performance.

Module 4

Deep Learning Specialization

Dive into the core concepts and advanced deep learning techniques with this module. It covers everything from neural networks and their architectures to popular frameworks such as TensorFlow 2, Keras and PyTorch. Gain hands-on practice with various models and optimization techniques, providing the skills needed to implement deep learning solutions for complex problems.

Learning Outcomes

- Develop a thorough understanding of deep learning principles and their evolution.
- Gain proficiency in building and training deep neural networks (DNNs).
- Master the use of TensorFlow and Keras for model development and optimization.
- Understand transformer models for natural language processing (NLP).
- Learn dropout and early stopping techniques to enhance model performance.
- Gain experience with autoencoders and PyTorch for deep learning applications.
- Gain expertise in convolutional neural networks (CNNs) for image classification and object detection.

Module 5

Essentials of Generative AI, Prompt Engineering & ChatGPT

This module provides an in-depth exploration of advanced AI topics, including generative AI, prompt engineering, large language models (LLMs), and ChatGPT. You will gain hands-on experience and practical insights into these technologies, learning how to apply them effectively in various business scenarios. The module emphasizes the critical role of prompt engineering in tailoring AI outputs to meet specific needs and achieve desired results.

Learning Outcomes

- Gain an in-depth understanding of generative AI models, their types, and operational principles.
- Explore explainable AI techniques for system transparency.
- Utilize prompt engineering techniques to enhance and direct the behavior of generative AI models.
- Master ChatGPT, including its underlying mechanisms, capabilities, and limitations.
- Learn about diverse applications and use cases where ChatGPT can be effectively deployed.
- Master fine-tuning strategies to adapt and optimize ChatGPT models for specific tasks.

Module 6

Capstone

Upon completing the core courses, you embark on a capstone project to apply your newly acquired skills. Guided by mentors, you learn to address real industry challenges directly. This project not only marks the culmination of your learning journey but also provides an opportunity to showcase your abilities to potential employers in a real-world context.



Electives:

1 NLP and Speech Recognition

This advanced course comprehensively explores the application of machine learning algorithms to handle extensive volumes of natural language data. It focuses primarily on natural language understanding, feature engineering, natural language generation, automated speech recognition, speech-to-text conversion, text-to-speech conversion, voice assistance devices, and the creation of Alexa skills. By the end of the course, you will possess a profound understanding of the principles underlying natural language processing and speech recognition, empowering you to create sophisticated applications in these domains.

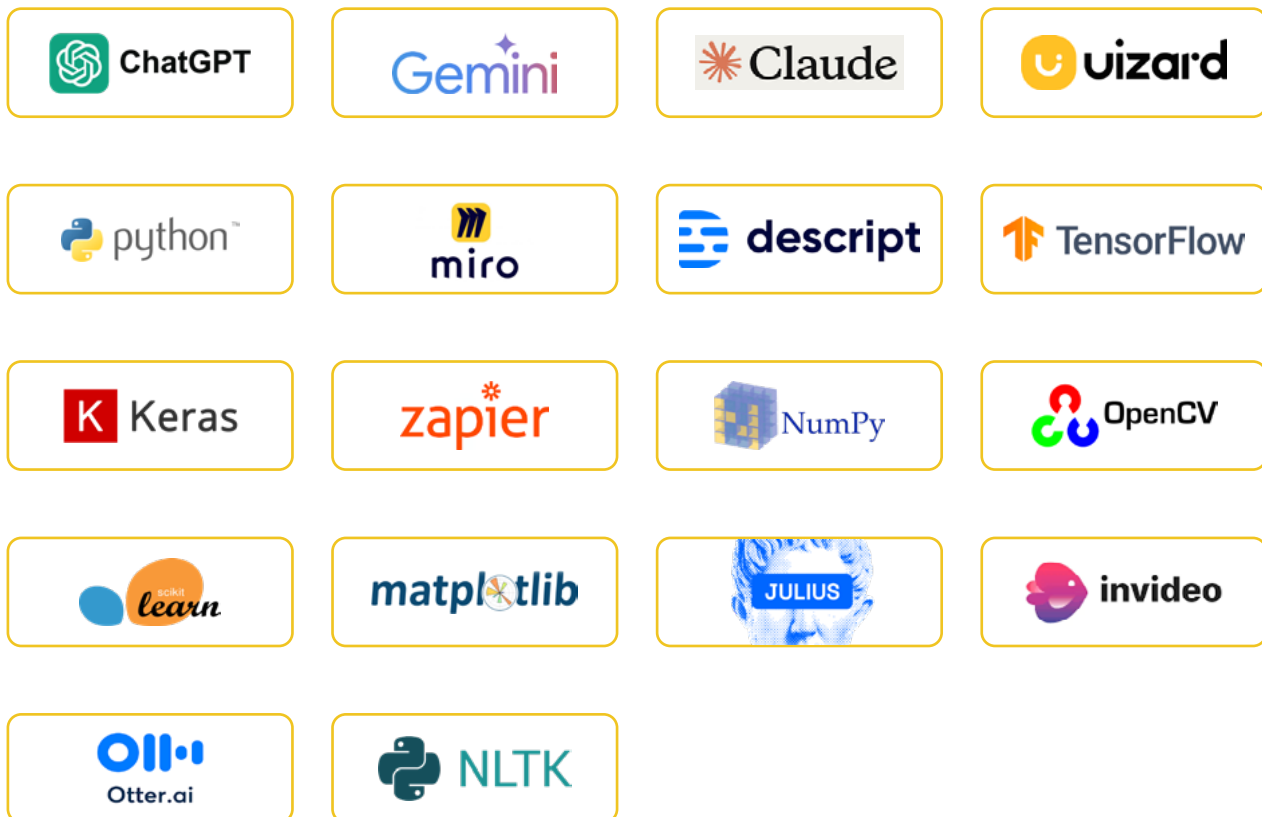
2 Academic Masterclass

These sessions led by distinguished IIT Guwahati faculty members will offer invaluable insights into the latest advancements in technology and techniques across expansive domains such as Data Science, Artificial Intelligence (AI), Generative AI (GenAI), and Machine Learning (ML). Through in-depth discussions and presentations, you will enhance your understanding of the cutting-edge developments that are shaping these fields. This will equip you with the knowledge and expertise needed to stay at the forefront of innovation in the constantly evolving landscape of technology.

Skills Covered

- ✓ Python Programming
- ✓ Data Manipulation
- ✓ Data Visualization
- ✓ Machine Learning Algorithms
- ✓ Supervised Learning Techniques
- ✓ Unsupervised Learning Techniques
- ✓ Building and Optimizing Models
- ✓ Designing and Implementing CNNs
- ✓ Sequential Modeling Techniques
- ✓ Prompt Engineering
- ✓ Natural Language Processing (NLP)
- ✓ Understanding GenAI Models

Tools Covered



Projects

MLB Digital Platform Enhancement



Develop backend modules for MLB's digital platform to manage player statistics, match schedules, and ticket bookings and implement a multi-threaded report generation system to enhance performance.

Marketing Strategies with Exploratory Data Analysis



Conduct exploratory data analysis and hypothesis testing to understand factors contributing to customer acquisition and enhance marketing strategies.

EdTech Backend System



Create backend modules for SL Tech's edtech platform to manage learner credentials, courses, and improve the overall learning experience.

Sales Strategy Analysis



Analyze AAL's fourth-quarter sales data across different Australian states to identify high-revenue states and develop sales programs for underperforming states, assisting the company in data-driven expansion decisions.

Predicting Employee Attrition with Machine Learning



Build a machine learning model to predict employee attrition by analyzing work habits and factors influencing their desire to stay with the company.

Song Classification with Cluster Analysis



Perform cluster analysis to create personalized song playlists for users based on their listening behavior.

Home Loan Data Analysis



Develop a deep learning model to predict the likelihood of loan defaults using historical data, ensuring a secure lending process.

Lending Club Loan Data Analysis



Create a deep learning model to predict loan defaults using historical data, addressing an imbalanced dataset with numerous features.

ChatGPT-Based Storytelling



Design an interactive storytelling adventure using ChatGPT to collaboratively create unique and engaging narratives without coding.

Road Safety Analysis of Autopilot Feature



Analyze accident data involving Tesla's autopilot feature to assess the impact of autopilot technology on road safety.

Predict the Demand & Sales of a Restaurant



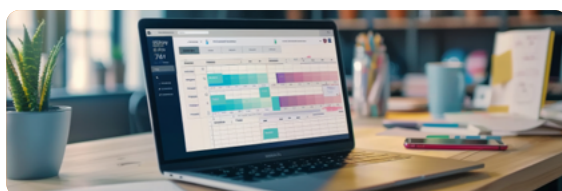
Predict demand for various items across restaurants using machine learning and deep learning algorithms to forecast sales over time.

AI Recommendation Engine for Marketing



Use AI to understand the state of historical structures and recommend the best places to visit to tourists.

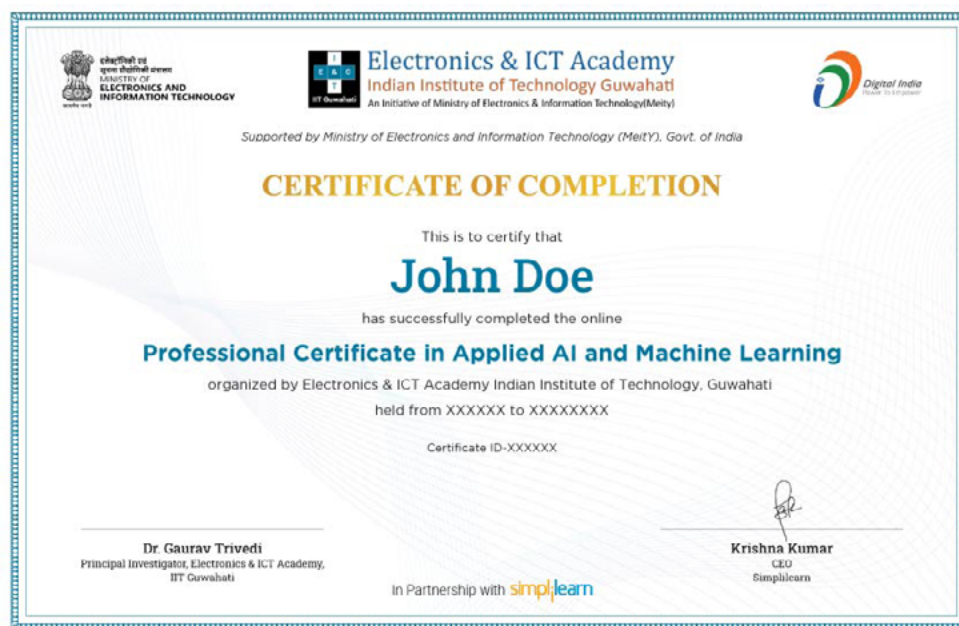
Virtual Project Management Consultant



Develop prompts for ChatGPT to function as a virtual project management consultant, providing advice on project planning, risk management, team collaboration, and performance tracking.

Certificates

Simplilearn has partnered with the E&ICT Academy, IIT Guwahati, to offer online professional programs. Simplilearn's award-winning immersive learning model delivered via live virtual classes focuses on applied learning methods to create an immediate career impact.



Upon completing this Applied AI and ML program, you will receive a program completion certificate from the E&ICT Academy, IIT Guwahati.

Program Advisor



Dr. Gaurav Trivedi

**Associate Professor, Electronics
and Electrical Engineering Principal
Investigator, E&ICT Academy,
IIT Guwahati**

Dr. Gaurav Trivedi is an Associate Professor of Electronics and Electrical Engineering at IIT Guwahati. He is also a Principal Investigator at the E&ICT Academy. With an M.Tech. in Microelectronics and a Ph.D. in Electrical Engineering from IIT Bombay, his research spans circuit simulation, VLSI CAD, electronics system design, computer architecture, semiconductor devices, hardware security, embedded systems, IoT, high-performance computing, large-scale optimization, and machine learning.



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