



Indian Institute of Technology Jammu
(IIT Jammu)

PG Certificate in AI- Enabled IoT & Embedded Systems

Type

Executive Program

Mode

Online

Duration

6 Months

Total fees

₹ 84,000

Indian Institute of Technology Jammu (IIT Jammu)

Established in 2016 under the mentorship of IIT Delhi, the Indian Institute of Technology Jammu is an Institute of National Importance committed to excellence in engineering, technology and research. The institute promotes interdisciplinary learning, innovation and industry collaboration through a modern academic ecosystem. IIT Jammu aims to develop skilled professionals capable of addressing emerging technological and societal challenges.

PG Certificate in AI-Enabled IoT & Embedded Systems

Highlights

- ◆ Build practical expertise across embedded systems, IoT architecture, machine learning and Edge AI.
- ◆ Gain hands-on experience through an IoT hardware kit, guided labs and application-based assignments.
- ◆ Work with industry-relevant tools including Arduino IDE, STM32Cube, PlatformIO, Node-RED and TensorFlow Lite.
- ◆ Apply learning through real-world use cases and a capstone project in areas such as smart homes, healthcare and industrial IoT.
- ◆ Participate in an optional two-day campus immersion and earn a PG Certificate through I3C-IIT Jammu.

Learning outcomes

- ◆ Design end-to-end connected systems integrating embedded hardware, IoT architecture and AI capabilities.
- ◆ Collect, process and analyse data generated by sensors and connected devices.
- ◆ Deploy optimised machine learning models on resource-constrained devices using Edge AI and TinyML.
- ◆ Integrate microcontrollers, communication protocols, cloud platforms and AI workflows into functional solutions.
- ◆ Develop and present a working AI-enabled IoT solution through a structured capstone project.

Eligibility Criteria

Academic Qualification Graduate degree in BE, B.Tech, BCA, MCA, B.Sc, or M.Sc in Science

Work Experience Minimum 1 year of work experience in any field

Curriculum Overview

Module I: Embedded Systems Basics (7 subjects)

- ◆ Microcontrollers vs Microprocessors
- ◆ ARM architecture (e.g. STM32)
- ◆ Arduino
- ◆ ESP32)
- ◆ Real-time Operating Systems (RTOS)
- ◆ C/C++ for Embedded Development

Module II: IoT System Design (3 subjects)

- ◆ IoT Architecture (Edge Gateway Cloud)
- ◆ Networking and Security in IoT
- ◆ Communication Protocols: MQTT HTTP LoRa Zigbee BLE Sensors & Actuators



Curriculum Overview (continued)

Module III: AI & Machine Learning Essentials (7 subjects)

- ◆ Supervised
 - ◆ Unsupervised
 - ◆ Reinforcement Learning
 - ◆ ML model development using Python
 - ◆ Scikit-learn
 - ◆ TensorFlow Lite
 - ◆ Data collection and preprocessing for IoT
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Module IV: AI on the Edge (5 subjects)

- ◆ Deploying ML on microcontrollers (TinyML)
- ◆ Model Optimization (Quantization Pruning)
- ◆ Use cases: Predictive maintenance
- ◆ Anomaly detection
- ◆ Smart vision



Curriculum Overview (continued)

Module V: Tools & Platforms (8 subjects)

- ◆ Arduino IDE
 - ◆ STM32Cube
 - ◆ PlatformIO
 - ◆ Node-RED for rapid prototyping
 - ◆ TensorFlow Lite for Microcontrollers
 - ◆ Google Cloud IoT / AWS IoT / Azure IoT Hub / Git
 - ◆ Docker (optional)
 - ◆ Jupyter Notebook
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Capstone Project Ideas (4 subjects)

- ◆ Smart Home Automation with Voice Recognition
- ◆ AI-enabled Health Monitoring Wearable
- ◆ Smart Agriculture System with Predictive Analysis
- ◆ Industrial IoT system with anomaly detection

Fee Structure

Fee heads	Year 1	Total
Application Fee	₹ 2,000	₹ 2,000
Program Fee	₹ 70,000	₹ 70,000
IoT Kit Fee	₹ 12,000	₹ 12,000
Total	₹ 84,000	₹ 84,000