

# Course Curriculum

Online Certification In  
**IOT, Cloud Computing and Edge AI**

By E&ICT Academy, IIT Guwahati



# ABOUT THE

## IIT GUWAHATI

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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

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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.



# PROGRAM CURRICULUM: LEARNING PATH

Master **Industry- IOT, Cloud Computing and Edge AI** through the most relevant curriculum designed by E&ICT Academy, IIT Guwahati and leaders from the industry.

## Introduction to IoT and Architecture

Module

01

What is IoT, IoT Architecture, IoT Applications, IoT Gateways, Middleware

## IoT Protocols

Module

02

HTTP/REST, MQTT, COAP, AMQP, Websockets, 6LoWPAN

## Node-RED

Module

03

Installation of Nodejs, Installation of Node-Red, Node-Red Dashboard

## IOT Security

Module

04

Introduction to mbed TLS and SSL, Importance of IoT application, AES encryption

## IoT/ ML Cloud Computing

Module

05

Cloud Computing, Deployment Models, AWS-IoT Core, Google IoT Cloud, LORA IoT

## Machine Learning with IoT

Module

06

Data Acquisition, Data Filtering and Pre-Processing, Tensorflow Lite, TinyML,

# COURSE CURRICULUM

## Introduction to IoT and Architecture

01

### Module-1: Introduction to IoT and Architecture

- a. What is IoT
- b. IoT applications in different domains
- c. Trends in IoT Market
- d. Smart things
- e. Gateway
- f. Middleware
- g. Edge vs Cloud functional partitioning

## IoT Protocols

02

### Module-1: IoT Protocols

- a. HTTP/REST
- b. MQTT
- c. COAP
- d. AMQP
- e. WEBSOCKETS
- f. 6LoWPAN

## Module-1: Node-RED

- a. Installation of Nodejs on Laptop
- b. Installation of Node-red on local
- c. Local broker installation
- d. Connection between local broker and Node-RED
- e. Node-RED dashboard

### Hands-on :

**NodeMCU Webserver & Node-RED Dashboard based monitoring system**

## Module-1: IOT Security

- a. Introduction to mbed TLS and SSL
- b. Importance of security in IoT application
- c. Use of hardware accelerated AES encryption on ARM MCU

## Module-1: IoT/ ML Cloud Computing

- a. Cloud Computing
- b. Benefits of Cloud
- c. Deployment Models
- d. AWS-IOT Core/ SageMaker and Greengrass
- e. Google IOT Cloud
- f. Thingspeak
- g. LORIOT
- h. IBM Bluemix

### Hands-On: Smart Environmental monitoring

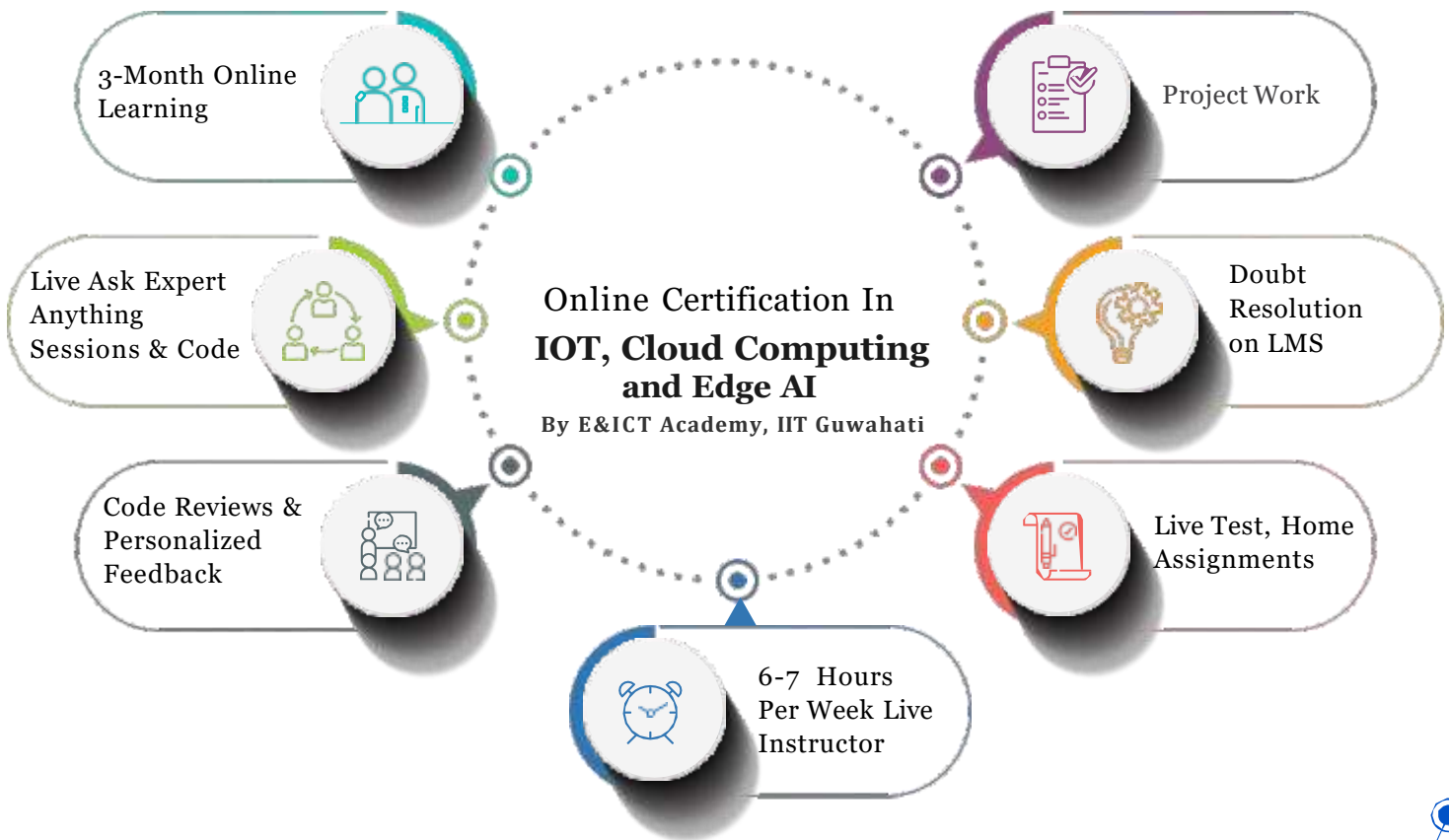
Sending sensor data to AWS Cloud and create dashboard  
Live sensor data upload to IBM BLUEMIX

## Module-1: Machine Learning with IoT

- a. Data Acquisition
- b. Data filtering and Pre-processing
- c. Tensorflow Lite
- d. TinyML
- e. AWS- IOT Core
- f. Google Collab
- g. Build, Train, and Deploy a ML Model on Edge device

**Hands-ON:** Vibration analysis using Edge impulse and IoT development board

Learn from one of the best faculty in India through live online sessions. While Academic Professors will help you learn IoT, Cloud Computing & Edge AI concepts, industry experts will impart practical knowledge of IoT, Cloud Computing & Edge AI through real world projects.



## TOOLS, LANGUAGES & FRAMEWORKS





## Program Information:

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