

# Appleton Innovations

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**MSME**  
MICRO, SMALL & MEDIUM ENTERPRISES  
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Ministry of MSME, Govt. of India

startupindia

## Advanced Internet of Things (IoT) Training

Master the most advanced electronic, automation and IoT cloud technology and build projects using IoT Development Kit. Learn **ESP8266, ESP32, Raspberry Pi, Arduino, Python, Thingspeak, Blynk, IBM Watson IoT, Microsoft Azure IoT and AWS IoT** Cloud Platforms. Using IoT Development kit, you will develop more than 15 Industrial Projects.

### Syllabus

#### Module-1: Introduction to Internet of Things

- Introducing to IOT
- IOT Applications
- IOT Network Architecture
- IOT Device Architecture
- IOT Communication Protocols
- IOT Product Development Overview

## **Module-2: Getting Started with Arduino**

- A tour of Arduino Board and Hardware: Power Supply, Power Pins,
- Analog and Digital Pins
- Types of Arduino Boards
- Introduction to Arduino programming
- Variables
- IF-Else conditional statements
- Loops: For, While
- Functions
- Digital Inputs and Digital Outputs
- The serial monitor
- Arrays and strings
- Using Libraries in Arduino
- Arduino data types
- Arduino Commands

## **Module-3: Sensors, Actuators & Electronics**

- Introduction to sensors and types
- Analog Sensors: Temperature, Light Sensor, Potentiometer,
- Digital Sensors: Soil Moisture sensor, Motion Sensor, DHT11 sensor, Button
- Digital Signals
- Basic electronics: resistors, capacitors, diodes, transistors and etc.,
- Introduction to Actuators
- Interfacing Piezo Buzzer
- Interfacing LED's
- Interfacing RGB LED's
- Interfacing Relay

## **Module-4: Wireless Communication Technologies**

- Introduction to wireless technologies: WiFi, Bluetooth, Ethernet, LoRaWAN, WiMAX and ZigBee
- Interfacing ESP8266 WiFi Shield
- Interfacing Bluetooth Module
- WiFi Station and Client

## **Module-5 : IoT using Blynk Mobile Platform**

1. Setting up Blynk
2. Install Blynk Library
3. Exploring various control widgets
4. Exploring various display widgets
5. Notification widgets and virtual pins

## **Module-6 : Smart Applets using IFTTT**

- Introduction
- Automate day to day activities through IFTTT
- Posting updates on Facebook
- Automation with IFTTT
- Sending text message notifications
- Google Voice to control Home Appliances

## **Module-7: Cloud Data Monitoring using Arduino**

- Concept & Architecture of Cloud
- Role of Cloud Computing in IoT
- Tools, API and Platform for integration of IoT devices with Cloud
- Internet of Things platforms for Arduino
- Posting the sensor data online
- Retrieving your online data
- Monitoring sensor data from a cloud dashboard
- IoT cloud platform and integration with Gateway
- Working with Thingspeak platform

## **Module-8: IoT using IBM Cloud**

- Getting Started with IBM Watson IOT Platform
- Send Sensor data to Watson IOT Platform using MQTT
- Visualizing real-time data by using boards and cards
- Getting started with Watson IoT Platform using Node-RED
- Watson IOT Node & IBM IOT App Node
- Create Node-RED application to receive events from the device

## **Module-9: IoT using AWS Cloud**

- Introduction to AWS IoT
- IoT Core Services
- Creating Devices in AWS IoT
- Using the AWS APIs and SDKs with IoT
- MQTT/HTTP/Websockets
- Credentials and composing an IoT policy from AWS IoT Core
- Using the MQTT.fx tool to test our connection and send data to AWS IoT Core
- Arduino Sketch to connect your ESP8266/ESP32 directly to AWS IoT Core
- ESP8266/ESP32 Arduino Sketch to send data to AWS IoT Core
- Real Time Control and Monitoring using AWS IoT

## Module-10 : IoT using Raspberry Pi and Python

- Getting Started with Raspberry Pi
- Interfacing Hardware with the Raspberry Pi
- Introduction to Python Programming
- Node-Red: M2M and Gateway
- MQTT Broker and client application

## Module-11: IoT with Microsoft Azure

- Getting started with Microsoft Azure IoT
- Setting up your Raspberry Pi
- Python Script to connect Raspberry Pi to Azure IoT
- Visualizing sensor data
- Sending user notifications

## Module-12: IoT Analytics

- Introduction to IoT Analytics
- HTTP, MQTT and CoAP
- Python for Data Analysis and Machine Learning
- Accessing IoT Data
- Processing IoT data
- Analyzing IoT data
- Predictive Analytics using ML

# IoT Development Kit

- NodeMCU (ESP32)
- Breadboard
- Relay Module
- DHT11 Sensor
- USB Cable
- Jumper Wires
- Light Sensor
- RGB LED
- Push Button
- Buzzer
- LED's
- Resistors

# Course Projects, Industry Projects



**Smart Home**



**Smart Light Bulb**



**Smart City**



**Smart Agriculture**



**IoT based Notifications**



**Smart Applets**



**Smart Health**



**Notification cube**

## Tools



## Training Highlights

- **Get Trained by Trainers from IIT Alumni**
- **90 + hours of Live Sessions**
- **Recorded Videos**
- **15 + projects**
- **40+ Hours of practical Assignments**
- **Guaranteed paid internship**
- **Dedicated mentoring sessions from industry experts**
- **Free IoT Kit**
- **Certification**

## Training Duration:

90+ hours

Three months (Training + Internship)

## Training Fee:

RS 8850/- per student

## For more details:

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