

## Short Term Courses-NIELIT Delhi Centre

### Certificate Course in

### IOT(Internet of Things) USING ARDUINO

#### **Course Objective:**

This Course mainly focus on IoT concepts along with hands on training such as sensing, actuation and communicating the data to Cloud using Arduino and ESP8266 (Node MCU). The course covers hands on training on the development of Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—which helps to develop the skills and experiences of student. The Internet of Things (IOT) is the next wave, which world is going to witness. Today we live in an era of connected devices the future is of connected things.

#### **Learning Outcome:**

After the completion of the course, the students will be able design some IOT based prototypes.

**Course Duration (In Hours): 40 Hours./ 4 weeks**

**Course Fees (INR): 2500/- + GST (18%)**

**Minimum Eligibility :** Pursuing/Passed BE/B.Tech/BCA/BSc(Electronics)

**Prerequisite:** Basic Knowledge of C or any other programming language.

### COURSE OUTLINE

S. No.	Modules to be Covered
1	<b>Introduction to IOT</b>
2	<b>Arduino integrated development environment</b>
3	<b>Interfacing Sensor &amp; Actuators with Arduino</b>
4	<b>Basic Networking NodeMcu with ESP8266 WiFi module</b>
5	<b>Cloud Platforms for IOT</b>
6	<b>Project Discussion</b>

## **DETAILED COURSE SYLLABUS:**

### **1. Introduction to IOT**

Understanding IoT fundamentals  
Various Platforms for IoT  
Real time Examples of IoT  
Overview of IoT components and IoT Communication Technologies Challenges in IOT

### **2. Arduino integrated development environment**

Arduino Uno Architecture  
Arduino Setup the IDE,  
Downloading of Arduino IDE - Installing of Arduino IDE  
Interfacing Arduino with Laptop/PC  
Writing Sketches.  
Arduino Software, Arduino Libraries  
Basics of Embedded C programming for arduino  
Ardiuno Interfacing - LED, pushbutton and buzzer.

### **3. Interfacing Sensor & Actuators with Arduino**

Overview of Sensors working  
Analog and Digital Sensors  
Ardunio Interfacing of Temperature, Humidity, Motion, Ultrasonic, Infrared, Current, Sound and Gas Sensor.  
Interfacing of Actuators with Arduinio.  
Ardiuno - Interfacing of Relay Switch.

### **4. Basic Networking with NodeMcu / ESP8266 WiFi module**

Basics of Wireless Networking  
Various WiFi library  
Web server- introduction, installation, configuration  
Posting sensor(s) data to web server

## **5. Cloud Platforms for IOT**

**Cloud services -- SaaS, PaaS, IaaS**

**Study of IOT Cloud platforms ThingSpeak API and Blynk, Adafruit I/O  
Interfacing Clouds and arduino with Web services.**

## **6. Project Discussion**

**Covid -19, Non Contact Thermometer.**

**Home Automation using Arduino.**