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 Ardiuno 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): 80(With Project)/60 hrs

Fees (INR): Rs. 9,000/- for 60 hrs and 10,000/- for 80 hrs (+GST as applicable)

Minimum Eligibility : Pursuing/Passed BE/B.Tech/BCA/BSc/NIELIT 'O' Level with graduation/Nielit 'A' Level

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

COURSE OUTLINE

S. No.	Module	Duration (in Hrs)
1	**Introduction to IOT**	**4**
2	**Arduino integrated development environment**	**10**
3	**Interfacing Sensor & Actuators with Arduino**	**16**
4	**Basic Networking with ESP8266 WiFi module**	**10**
5	**IoT Protocols**	**10**
6	**Cloud Platforms for IOT**	**10**
	Theory	**30**
	Practical	**30**
	Mini Project(For 80 hrs)	**20**
	Total	**60/80**

References:

1. Internet of Things : A hands- on Approach by ArsheepBahga (Author), Vijay Madisetti (Author)

2. Beginning C for Arduino, Second Edition: Learn C Programming for the Arduino by Jack Purdum

DETAILED COURSE SYLLABUS:

1. **Introduction to IOT**
   - **Understanding IoT fundamentals**
   - **IOT Architecture and protocols**
   - **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**
   - **Setup the IDE, Writing Arduino Software**
   - **Arduino Libraries**
   - **Basics of Embedded C programming for Arduino**
   - **Interfacing LED, push button and buzzer with Ardiuno**
   - **Interfacing Ardiuno with LCD**

3. **Interfacing Sensor & Actuators with Arduino**
   - **Overview of Sensors working**
   - **Analog and Digital Sensors**
   - **Interfacing of Temperature, Humidity, Motion, Light and Gas Sensor with Ardunio**
   - **Interfacing of Actuators with Ardunio.**
   - **Interfacing of Relay Switch and Servo Motor with Ardiuno**

4. **Basic Networking with ESP8266 WiFi module**
   - **Basics of Wireless Networking**
   - **Introduction to ESP8266 WiFi Module**
   - **Various WiFi library**
   - **Web server- introduction, installation, configuration**

- **Posting sensor(s) data to web server**

5. **IoT Protocols**
   - **M2M vs IOT**
   - **Communication Protocols**
6. **Cloud Platforms for IOT**
   - **Virtualization concepts and Cloud Architecture**
   - **Cloud computing, benefits**
   - **Cloud services -- SaaS, PaaS, IaaS**
   - **Cloud providers & offerings**
   - **Study of IOT Cloud platforms**
   - **ThingSpeak API and MQTT**
   - **Interfacing ESP8266 with Web services**

7. **Mini Project**