



# QJ Technologies

PROPOSAL FOR

## Internet *of Things* (IoT) **Training Workshop**

*“For anyone who wants to get started with Internet of Things, understand the contents of connecting sensors and actuators to the internet, this workshop is the right start.”*

### Contact:

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 Off.No-509, Sterling Centre, Opp. Hotel Aurora Towers, MG Road, Camp, Pune.



### Workshop Description

IoT workshop by QJ Technologies, provides best and most relative contents required for making the participants comfortable with the concepts of IoT. The workshop's main motive will be to help attendees get started with small things in IoT and motivate them to gain knowledge on deeper concepts.

### Key Features of Workshop

- **Organized Content**

The contents of the workshop are properly organized and arranged for better understanding of the concepts and help them grasp new things faster and enhance their knowledge.

- **Best Illustration**

The concepts, codes and tools are well illustrated by our experts through slides and practical performance which will help the concepts to be cleared faster and solve all the doubts.

- **Guaranteed Satisfaction**

Quality teaching is the most important factor we focus on. At end of the workshop, we will conduct a participant feedback. If the students are not satisfied with the workshop, we will refund 50% of the workshop training fees back to the students.

- **Certificate and Toolkit**

The Participants will be provided with Certificate of Participation along with a tool-kit containing all the workshop material.



## Workshop Contents:-

### **1. Getting Started**

- a. The Big Idea- IoT and its Working
- b. IoT Communication Protocols
- c. Demystifying the working of Internet
- d. Explaining the hardware(Sensors, Actuators, Controller)

### **2. Arduino IDE**

- a. Arduino IDE download and Installation (Linux/Windows)
- b. Getting Started with Arduino IDE.
- c. Introduction to Program Syntax.
- d. Understanding Embedded C Programming

### **3. Arduino and Microcontroller**

- a. Overview of Arduino Module.
- b. Deep Dive into the pin structure of Arduino module.
- c. Understanding the working of Analog and Digital Pins.
- d. Using the Power Pins for powering up the devices.

### **4. Connections and Basic Hardware**

- a. Getting familiar with Breadboard.
- b. Understanding working of Resistors, Capacitors, Inductors.
- c. Understanding Transistors and Diodes.
- d. Demonstration of Circuit Creation with Bread Board.

### **5. Coding with Arduino**

- a. Getting familiar with the Arduino Programming Structure.
- b. Writing a LED-Blink code for Arduino.
- c. Burning the code to the ATmega328P microcontroller.



## 6. Interfacing Sensors with Arduino

- a. Overview of Resistive and Digital Sensors
- b. Interfacing with a Resistive Sensor (Light Sensor, Potentiometer)
- c. Interfacing with Digital Sensors.
- d. Capturing sensor data and printing on Serial Monitor

## 7. Interfacing Actuators with Arduino

- a. Actuating an LED with Arduino
- b. Controlling LED's through Serial Monitor
- c. Fading an LED with Arduino PWM.

## 8. Arduino Micro-Projects

- a. Switching LED using an input Push Button
- b. Switching LED based on Light Sensor Data
- c. Controlling intensity of an LED through a Potentiometer

## 9. Introducing Wi-Fi module (ESP8266-01)

- a. Understanding the Pin Structure of ESP8266.
- b. Compiling a Custom Made NodeMCU firmware with selective libraries required.
- c. Flashing the Firmware into NodeMCU.

## 10. Introduction to NodeMCU

- a. Getting started with Programming LUA scripts and syntax.
- b. Writing a code to connect ESP8266 with Wi-Fi Hotspot.
- c. Creating a ESP8266 Wi-Fi Hotspot.
- d. Communicating with Network devices using ESP8266.

## 11. NodeMCU WebServer for Smart Systems (ESP-Micro Project 1)

- a. Create a NodeMCU webserver using LUA code.
- b. Intercepting get requests to control LED's.
- c. Controlling LED's via mobile phone / PC over Wi-Fi through Web Browsers.



### 12. Interfacing ESP8266 with Arduino

- a. Connecting ESP8266 to Arduino Module.
- b. Communication of ESP8266 with Arduino.
- c. Sending sensor data from Arduino to ESP8266.
- d. Sending data from other networked devices to Arduino via. ESP8266.

### 13. Creating an Internet of Things Application for Agriculture

- a. Interfacing a Soil Moisture Sensor with Arduino.
- b. Sensing soil moisture data using Arduino and printing on Serial Monitor.
- c. Sending Soil Moisture sensor data to server via. NodeMCU module.
- d. Showing live sensor data on a Webpage via. Cloud server.
- e. Triggering LED based on Soil Moisture Contents.

### Hardware Provided:-

1. Arduino Module with Cable.
2. Sensors:- LDR, Soil Moisture Sensor
3. WiFi Module:- ESP8266-01
4. Miscellaneous:-
  - a. Bread Board
  - b. Push Button
  - c. Resistors – 8 of varying value
  - d. Potentiometer
  - e. LED's – 5
  - f. Jumper Cables- 20 (12-Male to Female, 8 Male to Male)

### Target Audience

Anyone who is motivated to know the Working of IoT and wants to get started with IoT.

### Who can Attend?:

Attendee can be any person with basic knowledge of computers and programming.



# QJ Technologies

Internet of Things Training Workshop

## Duration:

2 Days (10:00 am to 5:00 pm)

## Toolkit:

Attendees will receive a toolkit containing all workshop material at the end of Workshop.

## Workshop Fees Distribution:

	Items	Qty.	Price(Rs.)
<b>Hardware Cost</b>			
	Arduino IDE with Cable	1	500
	LDR	1	20
	Soil Moisture Sensor	1	150
	ESP8266 Wifi Module	1	240
	Resistors	8	8
	Potentiometer	1	12
	LED's	5	10
	Jumper Cables	20	100
	Breadboard	1	90
	Push Button	1	5
	<b>Total Hardware Cost</b>		<b>1135</b>
	<b>Discounted Hardware Cost(Min. 8 Kits)</b>		<b>1000</b>
	<b>Training Cost</b>		
	<b>Total Cost</b>		

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