IoT Duino-Smart Home Workshop Module

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Workshop Overview

IOT Duino-Smart Home is an Arduino based Internet of Things (IoT) workshop about controlling the house hold appliances wirelessly from anywhere in the world using Wi-Fi Technology. The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. And Wi-Fi is a technology that uses radio waves to provide network connectivity. The workshop aims to introduce students to the field of Internet of Things (IoT) and how it is implemented in real life. It basically focuses on conceptualization and designing of Wi-Fi based home automation system which will help them to clear the fundamental concepts on "How to build a Wi-Fi controlled Wireless Home Appliances System??".

The Workshop includes a detailed study structure, delivered & demonstrated live by our experts in the field of Internet of Things(IoT). To start communication through Wi-Fi, the connection between two Wi-Fi is established. Once the student acquires knowledge about its basic operations, it can be further employed for Robot, Digital Notice Board, Motor Control, Wheel Chair Control, etc.

We at ABLab Solutions would get you closer to the basic Internet of Things (IoT) domain right from the fundamentals to its implementation to successfully control home appliances wirelessly using Wi-Fi technology.

Learning Outcomes

- **How to use Arduino-Sketch software tool**
- **How to write program for Arduino**
- **How to interface LED with Arduino**
- **How to interface 16X2 Alphanumeric LCD with Arduino**
- **How to drive a relay with Arduino**
- **How to control home appliances wirelessly from an Android Mobile or Laptop using Wi-Fi Technology**

Program Benefits

- Clear your fundamentals of Embedded System
- Build & develop your own Wi-Fi controlled wireless home appliances system
- Gain conceptual knowledge on Embedded System, Embedded C++, Arduino, Relay, Wi-Fi etc.
- Get trained by experts
- Awarded certificate on **"IoT Duino-Smart Home"**
- Live Demos and Interactive Question & Answer sessions
- Get useful Materials

Course Outline

- Introduction to Embedded System
- Overview of Basic Electronics
- Overview of Digital electronics
- Introduction to Arduino Platform
- Features of Arduino UNO
- Arduino Software Tool- Arduino Sketch
- I/O Ports of Arduino UNO
- LED Interfacing with Arduino
- Introduction to 16X2 Alphanumeric LCD
- 16X2 Alphanumeric LCD Interfacing with Arduino
- Horizontal Scrolling in 16X2 Alphanumeric LCD with Arduino
- Vertical Scrolling in 16X2 Alphanumeric LCD with Arduino
- Relay
- Different types of Relay
- Relay Interfacing with Arduino
- USART
- USART of Arduino
- Wi-Fi Protocol
- ESP8266 Wi-Fi Module
- AT Commands for ESP8266 Wi-Fi Module
- ESP8266 Wi-Fi Module Interfacing with Arduino

- Accessing ESP8266 Wi-Fi Module through the Web Browser on Mobile or Laptop over Wi-Fi Network
- Getting the IP Address of the ESP8266 Wi-Fi Module
- Relay and ESP8266 Wi-Fi Module based Android Mobile Controlled Wireless Home Appliances System with Arduino

Practicals

- LED Interfacing with Arduino
- LED Blinking with Arduino
- 16X2 alphanumeric LCD Interfacing with Arduino
- Horizontal Scrolling in 16X2 Alphanumeric LCD with Arduino
- Vertical Scrolling in 16X2 Alphanumeric LCD with Arduino
- Relay Interfacing with Arduino
- Getting the IP of ESP8266 Wi-Fi Module using 16X2 Alphanumeric LCD
- Getting the IP of ESP8266 Wi-Fi Module using Serial Monitor
- Relay and ESP8266 Wi-Fi Module based Android Mobile Controlled Wireless Home Appliances System with Arduino
- Password Protected Relay and ESP8266 Wi-Fi Module based Android Mobile Controlled Wireless Home Appliances System with Arduino

Kits Detail

- Arduino UNO Board- 1pc
- USB AM-BM Cable - 1pc
- ESP8266 Wi-Fi Module - 1pc
- Quad Relay Driver - 1pc
- 12V, 1A Adapter
- Required Connectors

Materials

Sample Codes & Project PDFs

- LED Interfacing with Arduino
- LED Blinking with Arduino
- 16X2 alphanumeric LCD Interfacing with Arduino
- Horizontal Scrolling in 16X2 Alphanumeric LCD with Arduino
- Vertical Scrolling in 16X2 Alphanumeric LCD with Arduino
- Relay Interfacing with Arduino
- Arduino to PC Communication with Serial Monitor
- PC to Arduino Communication with Serial Monitor
- Full Duplex Communication between PC and Arduino with Serial Monitor
- Arduino to PC Communication with LCD Display
- PC to Arduino Communication with LCD Display
- Full Duplex Communication between PC and Arduino with LCD Display
- ESP8266 Wi-Fi Module Interfacing with Arduino
- Getting the IP Address of ESP8266 Wi-Fi Module with LCD Display
- Getting the IP Address of ESP8266 Wi-Fi Module with Serial Monitor
- Relay and ESP8266 Wi-Fi Module based Android Mobile Controlled Wireless Home Appliances System with Arduino
- Password Protected Relay and ESP8266 Wi-Fi Module based Android Mobile Controlled Wireless Home Appliances System with Arduino

Softwares, Installation Guides, User Guides

- Arduino Sketch
- VCOM Driver(for Window XP, 7, 8, 8.1 & 10)

Datasheet

- IC 7805
- ATmega328
- ESP8266 AT Commands

User Manuals

- **Arduino UNO Board User Manual**
- **Quad Relay Driver User Manual**

Course Duration

The duration of the workshop will be of 16 hours (2 days) which includes both theory and practical sessions.

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