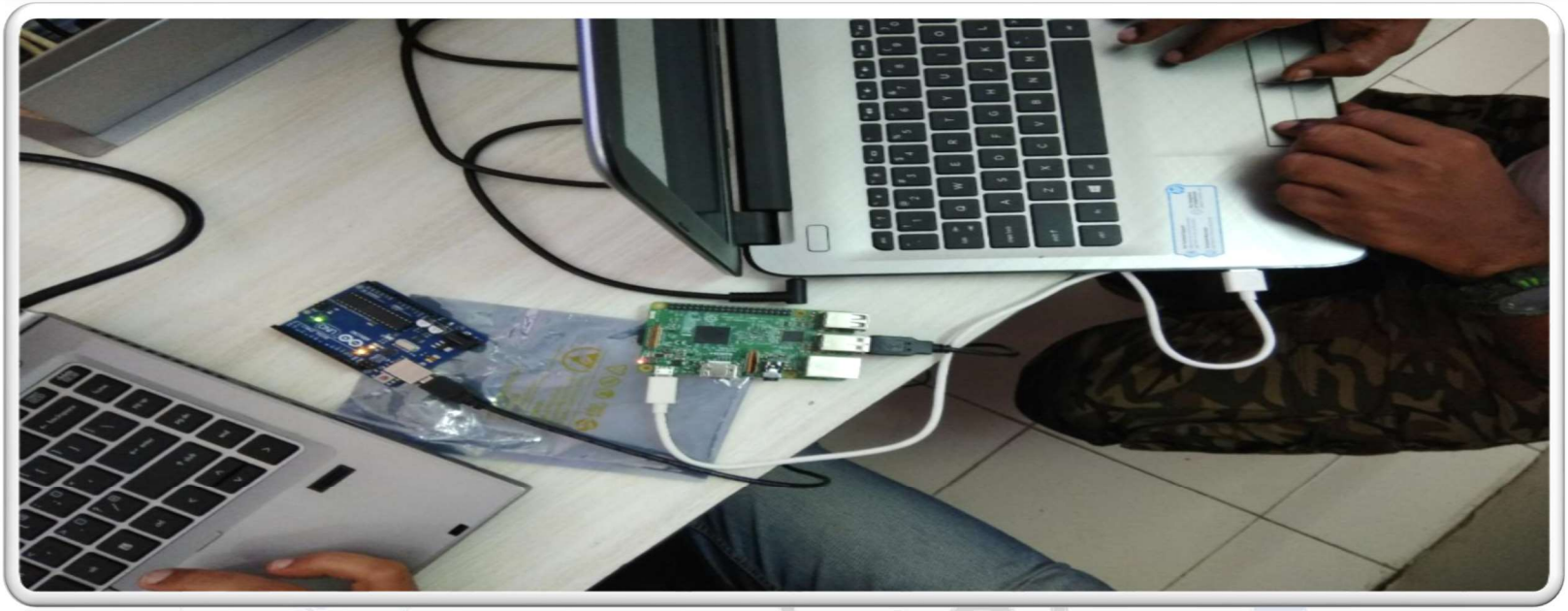
Advanced IoT Course Contents



Motive:

Our advanced IoT course intends to provide a deep understanding knowledge on IoT, in this programme Embiot Technologies Pvt Ltd covering nine sessions that has theory and practical approach. Course included three controllers, which are Arduino Uno, ESP8266 and Raspberry pi.

Sessions are made to understand the Architecture and behaviour of the models and bring them into the network of communication. The sessions are also include the Bluetooth, Zigbee and wifi protocol, different clouds are used to understand the Mqtt protocol for the complete understanding of IoT

embiot

Embedded and IoT Platform

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Session 1

IoT EXPLAINED

- What is IoT?
- Basics of IoT
- IoT in home automation
- IOT Industrial Applications
- How large is the IOT Market
- Latest updates in the IOT industry.
- Available IOT alliances details and the standards that are getting evolved
- Multiple IOT applications and solutions available in market
- Multiple IOT platform (hardware) example Raspberry-pi, Arduino, NodeMcu etc., comparison and usage

Session 2

INTRODUCTION TO NODE MCU

- What is Node MCU?
- What is Open Source Microcontroller Platform?
- Node GPIO Pins
- Basics of Electronics.
- Sensors.

Session 3

INTRODUCTION TO NODE MCU

- About Arduino IDE (Your First Arduino Sketch)
- First Program on Arduino IDE
- Digital Output as LED glow
- Digital Input Using Switch
- Control Output using Digital Input

Session 4

HANDS-ON WITH NODE MCU

- About Arduino IDE (Your First Arduino Sketch)
- First Program on Arduino IDE
- Digital Output as LED glow
- Digital Input Using Switch
- Control Output using Digital Input

Session 5

HANDS-ON WITH NODE MCU

- About Arduino IDE (Your First Arduino Sketch)
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- Digital Input Using Switch
- Control Output using Digital Input

Session 5

PWM

- Introduction to PWM
- PWM Hands-on-Practical

USING DIFFERENT SENSORS

- DHT 11 Temperature & Humidity Sensor
- Ultrasonic Sensor
- IR Sensor

Session 6

WIFI MODULE

- Introduction to Esp8266
- Scanning WiFi Networks and connecting to WiFi Network

WEB SERVER

- Creating a Webserver using NodeMCU and ESP Module
- Connect with WiFi network
- Access the IP address assigned to ESP8266 and Node Mcu
- Creating a Web page and control Home Appliances through Wifi

Session 7

IMPLEMENTAION OF IOT

- Create a local server using Node MCU
- What are cloud Servers
- Cloud computing and IOT
- Popular Cloud Servers
- Cloud platform introduction
- Creating Channel for live data feed
- Program Node MCU to read and update sensor data over cloud

THINGSPEAK APPS

- Creating account on ThingSpeak
- Connect temperature and humidity sensor
- Continuously monitor sensor reading through internet
- Generate API and program Node MCU

Session 8

CREATING TWITTER APP ON THINGSPEAK

- How to create apps on ThingSpeak?
- Create a twitter API
- Trigger an action of twitting through Node MCU
- Make ESP8266 and Node MCU to tweet the sensor value

BLYNK APP

- Installing Blynk Android App and creating account
- Creating UI for controlling Home Appliance
- Controlling Home Appliance Using Blynk Android App

IFTTT – IF THIS THEN THAT

- Creating account on IFTTT
- Creating Applets on IFTTT
- Controlling Home Appliance Using Google Assistant

Session 9

ADAFRUIT IO

- MQTT protocol
- HTTP vs MQTT
- Creating Adafruit account
- Using Adafruit to read sensors value and send data to Node MCU

AMAZON AWS

- How to create account on Amazon Aws and create EC2 Instance
- Installing Ubuntu Server on Aws Ec2 Instance
- Installing Apache Server and Php on Ubuntu
- Install and Configure MySql on Ubuntu
- Installing PhpmyAdmin
- Using Putty and FileZilla
- Using Elastic IP to make server IP static
- Login to Ubuntu Server Using Putty

MySQL

- Creating MySql database and tables to store sensor values
- Creating MySql User authenticated with Password

PHP

- Introduction to Php and its Basic Syntax
- Creating API to read sensor data and send to Aws Cloud
- Creating API to send data to NodeMcu from Cloud

ESP8266 HTTP CLIENT

- Using Http Client to send sensor data to Aws Cloud
- Using HTTP Client to receive data from Cloud to Node MCU

Projects: -

- Digital Input/output for Node MCU
- Analog Input/output for Node MCU
- Integrating Sensors & Reading Environmental Physical Values
- Using IR Sensor to detect object.
- Using LDR
- PWM application to control LED Brightness
- Using Relay as an Electronic Switch
- Home Automation Project on a local and Live Server
- Create a localhost server
- Use Node MCU to upload free data from Environmental Sensors to Cloud Server.
- Automatically Tweet Sensor Data on Twitter.
- Control Home devices from self-hosted webpage on Amazon AWS.
- Controlling Home Appliance using Google Assistant
- Calculating Distance using Ultrasonic Sensor
- Fetching Humidity and Temperature using DHT 11 Sensor
- Using ThingSpeak, Adafruit and Blynk IOT Platforms. Personal cloud (Raspberry pi)

Registration:

Follow https://www.embiottechnologies.com/

- The complete internship will be conducted online.
- Materials and Guidelines provided for each sessions
- Group registration will get a chance of final year project idea and support

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