

INTERNET OF THINGS INTERNSHIP COURSE—

WEEK-1

- ❖ INTRODUCTION TO IOT
 - Introduction to IoT
 - IoT and Its Application
 - How M2M is different from IoT
 - Components of IoT
 - IoT Devices
 - IoT Communication Protocols
 - IoT and Its Future
- ❖ COMMUNICATION PROTOCOLS
 - UART/USART (RS232)
 - SPI
 - I2C
 - MQTT
 - REST API
 - HTTPS
 - COAP
 - AMQP
 - XMPP
- ❖ GETTING STARTED WITH ARDUINO
 - Introduction to Microcontroller
 - Introduction to Arduino
 - What is ARDUINO?
 - What is open source Microcontroller platform?
 - Arduino UNO R3 board
 - Pin configuration
 - USART in Arduino
 - ADC in Arduino
 - PWM in Arduino
 - WatchDog timer in Arduino
 - Arduino I2C
 - Basics to Developing Bootloader for Arduino

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- Adding a New Library to Arduino IDE and Using It
- Basic functions related to startup and GPIO in Arduino

- Basic functions related to Serial Communication in Arduino
- Basic functions related to Time and Interrupts in Arduino

WEEK-2--

❖ INTERFACE

- ❖ Hc-05 Bluetooth module interface with Arduino
- ❖ Analog Joystick with Arduino
- ❖ PIR sensor interfacing with Arduino
- ❖ DHT-11 sensor interfacing with Arduino
- ❖ DC motor interfacing with Arduino
- ❖ 7 segment display using Arduinos
- ❖ OLED interface with Arduino
- ❖ Ultrasonic sensor interfacing with Arduino

WEEK-3--

❖ NODEMCU BASICS

- Introduction to Nodemcu
- Getting Started with Nodemcu
- Nodemcu development kit/board

❖ NODEMCU WITH ARDUINO IDE

- Getting Started with NodeMCU using Arduino IDE
- NodeMCU GPIO with Arduino IDE
- NodeMCU ADC with Arduino IDE
- NodeMCU PWM with Arduino IDE
- NodeMCU GPIO Interrupts with Arduino IDE
- NodeMCU SPI with Arduino IDE
- NodeMCU I2C with Arduino IDE
- HTTP Client on NodeMCU with Arduino IDE
- HTTP Server on NodeMCU with Arduino IDE
- NodeMCU MQTT Client with Arduino IDE

WEEK-4--

❖ NODEMCU INTERFACING

- DHT11 Sensor Interfacing with NodeMCU and sending data to Thingspeak
- Ultrasonic sensor interfacing with Nodemcu and sending data to Thingspeak.

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- Servo Motor Interfacing with NodeMCU and controlling using GUI
- DC Motor Interfacing with NodeMCU
- PIR Interfacing with NodeMCU
- HC-05 Bluetooth Module Interfacing with NodeMCU
- OLED Graphic Display Interfacing with NodeMCU
- Control Home appliances using Thinger.io
- Control Home appliances using Google Assistant

WEEK-5--

- ❖ Raspberry pi basics
 - Raspberry Pi Introduction
 - Getting Started with Raspberry Pi
 - How to use WiringPi Library on Raspberry Pi
 - Access Raspberry Pi Home Screen on Laptop Display using LAN(Ethernet)
 - Raspberry Pi GPIO Access
 - Raspberry Pi PWM Generation using Python and C
 - Raspberry Pi UART Communication using Python and C
 - Raspberry Pi I2C
 - Python based I2C functions for Raspberry Pi
 - Access Raspberry Pi on Laptop using Wi-Fi
 - Using Raspberry Pi 3 On-Board Bluetooth for Communication

- ❖ Raspberry Interface
 - Home Automation Using Raspberry pi
 - DHT-11 sensor data on Node-red dashboard using MQTT protocol.