Internet of Things Using Node MCU

NodeMCU is open source IOT platform with firmware which runs on ESP8266 WiFi SOC. During this workshop you can prototype your IOT project with some quite easy steps. The NodeMCU firmware is a companion project to the popular NodeMCU dev kits, ready-made open source development boards with ESP8266-12E chips. The NodeMCU programming model is similar to that of Node.js, only in Lua. It is asynchronous and event-driven. It can be seen as latest and smallest board for creating an IOT environment.

Introduction to IoT:

- Introduction to Internet of Things (IoT)
- Why IoT? How IoT is changing the world?
- Applications of IoT

System components of IoT:

- The Thing
- The Local Network/Sensor Network
- The Internet
- The cloud

Hardware overview of IoT:

- The Arduino platform & its programming concepts
- The Raspberry Pi platform & its programming concepts
- NodeMcu and Wifi Modules

Different sensors in IoT application development and their interfacing techniques:

- Light: LDR, photodiodes, phototransistors
- Heat: Temperature sensor
- Motion: PIR Motion Sensor
- DHT Sensor
- Ultrasonic Sensor
- Smoke Sensor

Wireless modules and their interfacing techniques:

- Bluetooth
- IR
- Wifi

Introduction to microcontrollers, Arduino platform

- What is Microprocessor and Microcontroller?
- Block Diagram of Microprocessors and Microcontrollers
- Overview of popular industrial microcontrollers & its classifications
- Exposure to ARDUINO hardware platform: Varieties of Arduino boards & Shields
- Exposure to ARDUINO software platform: functions & their syntax

Node MCU:

- What is Node Mcu and its pin diagram
- Memory and register segments
- Environment setup for programming
- Pin mapping with Arduino

Implementation 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
- Continuously monitor sensor reading through internet
- Remotely Temp. Monitor using Nodemcu

Working with IFTTT

- MQTT Protocol
- Using Adafruit IO
- Getting Sensor Values and Updating it Live
- Controlling of I/O over the Internet
- Google Assistant based IO Control
- Home Automation implementation

Project Covered:

- Whether Monitoring
- Health Monitoring on mobile
- Home appliances control from any where
- Secure from COVID-19
- Smart Home Automation System
- Smart Agriculture

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Hardware Kit Detail

- Node Mcu Controller
- USB Cable
- Breadboard
- DHT Sensor
- Ultrasonic Sensor
- Smoke Sensor
- IR Sensor
- LED's
- Moisture Sensor
- Connecting Wires