

Automation Engineers AB Pvt Ltd, NOIDA

Crash-Course on Internet of Things (IoT)

Course Syllabus:

Duration: 6 Weeks (60 Hours)

Topics in brief:

1. Introduction

- What is IOT- In Depth Explanation
- Concepts and Technologies behind Internet of Things (IOT)
- The Past, Present, and Future of IOT
- Scope of IOT in India
- How large is the IOT Market in Different Domain
- Different skills required to become an IoT developer

2. Iot Architecture

- IOT Network Architecture
- IOT Device Architecture
- IOT Application Architecture
- IOT cloud Architecture

3. Iot device design

- Sensors – Classification & selection criteria based on nature, frequency, and amplitude of signal
- Embedded Development Boards – Arduino, Raspberry Pi
- Interfacing peripherals & Programming GPIOs – Input/output peripherals, Sensor modules
- Design Considerations – Cost, Performance & Power Consumption tradeoffs

4. Getting started with raspberry pi

- Introduction to Raspberry pi
- Raspberry pi different model comparison
- Raspberry Pi operating system choices
- Set up your Raspberry pi
- Raspbian OS

5. Using Linux OS commands on Raspberry Pi

- Introduction
- Linux vs other Operating system
- Linux basic commands
- Installation of packages
- File Management in Linux

6. Remote access to raspberry pi

- Remote Access using SSH
- Remote Access using TightVNC

7. Embedded system with raspberry pi

- Introduction to Embedded system
- Embedded system basic block diagram
- Difference between Microprocessor and Microcontroller
- Key points for Choosing the Right Microcontroller
- Using Raspberry Pi in Embedded System

- Raspberry pi GPIO interfacing
- Led Interfacing with Raspberry pi using python
- Switch counter project using python
- DC Motor Interfacing with Relay
- H-Bridge Circuit
- Working of L293D
- PIR sensor interfacing with raspberry pi
- DHT22 /11 sensor interfacing with Raspberry pi

8. Iot communication protocols

- Wired Communication Protocols – UART, USART
- Wireless Communication Protocols – Bluetooth , Wi-Fi
- Networking Protocols – OSI Reference Model, TCP/IP, Ethernet
- Application Protocols – HTTP, Web sockets, MQTT

9. Cloud computing

- Overview of Computing
- Different types of computing
- Concept of cloud computing
- Architecture of Cloud
- Description on IaaS , PaaS , SaaS
- Top Cloud service providers
- Role of Cloud Computing in IOT Tools, API and Platform for integration of IOT devices with Cloud
- CloudFoundry

10. Introduction to IOT platforms

- What is an IOT platform?
- Sending data to thingpeak
- Sending data to pushover
- Communicating with Adafruit IO

11. Projects

- Projects using different IOT platforms
 - Voice controlled HOME APPLIANCES (Smart homes)
 - Chat bots
 - IOT clouds
 - SMS based security/theft systems
 - GPS based projects (save life during accident)
 - Blynk app based home automation using NODEMCU