

**IOT BEGINNER COURSE DURATION - 1 MONTH (45 Hrs.)**

**1) Overview of Course (Theory) - 1 Hr.**

- Introduction to IOT – An Overview

**2) IoT Overview (Theory) – 2 Hrs.**

- IoT Definition
- Internet of Things - In-depth explanation
- Applications in different domains
- IoT market in different domains
- IoT Business
- Future of IoT
- Jobs in IoT

**3) Architecture (Theory) – 1 Hrs.**

- Architecture - Introduction
- Technology stack
- Hardware and software development Platforms
- Node and Gateways
- Development boards
- SOC and IC
- Data streaming
- IoT data store
- Analytics & Visualization

**4) IoT World (Theory) – 1 Hrs.**

- Overview of IoT world

**5) Embedded Systems (Theory) – 2 Hrs.**

- Definition of Embedded System
- Embedded System Introduction
- Different areas of Embedded System applications
- Types of Embedded Systems

**6) Microprocessors & Microcontrollers (Theory) – 1 Hrs.**

- Microprocessors Vs Microcontrollers
- Different types of Microcontrollers
- Use of Microcontrollers for IoT

**7) Open Source Hardware Boards (Theory) – 1 Hrs.**

- List of open source hardware boards
- Pin out of different boards
- Advantage of open source boards in IoT

**8) IDE's (Theory/ Practical) – 5 Hrs.**

- List of IDE's used in programming IoT device
- In-depth explanation of Arduino IDE
- Overview of Energia IDE

**9) Sensors & Actuators (Theory/ Practical) – 4 Hrs.**

- What is Sensor & Actuator
- What is a good sensor
- Sensor properties and their classification
- Types of sensors
- Selecting a sensor for your use case
- List of sensor manufacturers
- List of sites for buying sensors
- Integrating different sensors with open source boards

**10) IoT Gateways (Theory/Practical) – 2 Hrs.**

- Introduction to Gateways
- List of Gateways
- Integrating Gateway with Node
- Streaming node data on to cloud using Gateway

**11) Communication Protocols (Theory / Practical) – 2 Hrs.**

- Introduction to communication architecture
- Network protocol stack
- Channels and protocols
- RF: ZigBee, Blue Tooth, BLE, Zwave, Mesh network
- Communication Channels: GSM/GPRS, 2G, and 3G, LTE, Wi-Fi, & PLC
- IoT protocols: MQTT/MQTTS, CoAP, 6LoWPAN, IPSO, Thread, like TCP, UDP, HTTP/s, CoAP, and MQTT
- Comparison of the different IOT protocols, advantages and disadvantages (limitations) of these IOT protocols
- IPv4 addressing problem for IOT
- Introduction to IPv6 required to address more devices
- Application issues with RF protocol power consumption, LOS, reliability & Security Aspects.

**12) Cloud Computing Overview (Theory) – 1 Hr.**

- What is cloud?
- What is cloud computing?
- Benefits of cloud.
- History of cloud computing.
- Deployment Models.
- Top cloud providers.
- Service Models
- Different Services from Amazon

**13) IoT Platforms (Theory / Practical) – 2 Hrs.**

- Introduction to Platforms
- Features of IoT platform
- Different IoT Platforms available
- In-depth explanation of 3 different IoT platforms

**14) End to End Design of IoT Device (Theory/Practical) – 1 Hr.**

- Design of an IoT device overview
- Steps to be followed in building IoT device

**15) Use Cases of IoT (Theory/Practical) – 4 Hrs.**

- Home automation space
- Fleet management system

**16) Project – 15 Hrs.**