

IOT ASSOCIATE COURSE DURATION - 03 MONTH (135 Hrs.)

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

- Introduction to IOT – An Overview

2) Recall of IoT basics (Theory) – 3 Hrs.

- Discussion on basic IoT

3) Fundamentals of Basic Electronics (Theory) – 4 Hrs.

- Introduction to basic electronics
- Study of different electronic components
- Different types of data communication

4) C Programming (Theory/ Practical) – 10 Hrs.

- Introduction to C programming
- Overview of C programming
- Practice C Programming

5) C++ Overview (Theory/Practical) – 10 Hrs.

- Introduction to C++
- Features of C++
- Comparison of C++ with C

6) Basic Embedded C Programming (Theory/ Practical) – 10 Hrs.

- Introduction to Embedded C programming
- Overview of Embedded C programming
- Embedded C for IoT

7) Communication Protocols (Theory / Practical) – 4 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, And PLC
- IoT protocols: MQTT/MQTTS, CoAP, 6LoWPAN, IPSO, TCP, UDP, HTTP/s, etc.
- Comparison of IOT protocols, Advantages & Disadvantages (Limitations)
- IPv4 addressing problem for IOT
- Introduction to IPv6 required to address more devices
- Application issues with RF protocol power consumption, LOS, reliability & Security Aspects

8) Design Challenges & Security in IoT (Theory) – 1 Hr.

- Design challenges in IoT
- Security challenges in IoT

9) IoT Platforms (Theory / Practical) – 5 Hrs.

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

10) End to End Design of IoT Device– 1 Hr.

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

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

- Home Automation Space
- Fleet Management System

12) Web Services Overview (Theory) – 1 Hr.

- Introduction to web services
- Webservices overview

13) RTOS for IoT (Theory / Practical) – 4 Hrs.

- Definition of RTOS
- RTOS Vs GPOS
- Features of RTOS
- List of RTOS
- RTOS for IoT

14) Python Programming – 10 Hrs.

- Introduction to Python
- Operators & Data types
- Control flow
- Files & Modules
- Functions & Classes
- Database Programming

15) Configuration of Raspberry Pi – 4 Hrs.

- Introduction to Raspberry Pi
- Raspberry pi Pin out
- Configuring Pi with Raspbian OS

16) Configuration of Beagle Bone – 4 Hrs.

- Introduction to Beagle Bone Board
- Beagle Bone pin out
- Configuring Beagle Bone with Debian OS

17) IoT with Python (Theory / Practical) – 4 Hrs.

- Programming Raspberry Pi using Python
- Programming Beagle Bone using Python
- Design of an IoT device using Pi
- Design of an IoT device using Beagle Bone

18) IoT Use Cases (Theory / Practical) – 10 Hrs.

- Long range vehicle Detection & Identification
- Connected Trash Bins | Employee/ Student Tracking Systems
- Smart Street Lights | Smart Agriculture | Home Automation
- Environment Monitoring System | Health Domain
- Industrial IoT device

19) Project – 45 Hrs.