Advanced IOT Training Module (40 Hours)

SESSION-1: Basic IOT Architecture (2 Hours)

- **End-To-End IOT Architecture with detailed explanation**
- **IOT Application or Use-Case with IOT Analytics**
- **IOT Market Landscape/Business or JOB opportunities in detail**
- **Availability of Readymade IOT Hardware + Software + Platform solutions**

SESSION-2: Hardware Design & Interfacing (4 Hours)

- **Embedded Hardware Overview**
- **Arduino Programming Fundamentals: Arduino IDE**
- **Hands on Session: Read Real world data from Analog/Digital sensors &Actuators/Output interfacing with microcontroller.**

SESSION-3: Communication & Network Theory (4 Hours)

- **Depth explanation of each and every layer of TCP/IP stack with practical examples**
- **IPv4 addressing problem for IOT and introduction to IPv6. OR Why IPv6 is required to address more devices?**
- **Networking Theory**

1. OSI Layer model

2. Protocol stack Model

3. IOT Protocols

4. Importance of Brokers

5. Packet size (Header length)/payload tracing using Wireshark network analyser tool

SESSION-4: Environmental Applications on thing-speak IOT cloud platform (4 Hours)

- **Connectivity Protocol- GPIO(Wired)**
- **Communication Channel- Ethernet**
- **Messaging Protocol- REST/Web Socket**
- **IOT Cloud Platform- Thing Speak IOT Platform**

SESSION-5: Energy & Industrial Applications on Blynk IOT cloud platform (4 Hours)

- **Communication Channel- Ethernet/Wi-Fi**
- **IOT Cloud Platform- BLYNK IOT Platform**

SESSION-6: Build your first End-To-End IOT product using Rasp-berry pi device (5 Hours)

- **Getting started with Raspberry-Pi:**
- **Raspberry-Pi Hardware Description & Interfacing**
- **Components + Booting**
- **Wi-Fi/Bluetooth setup**
- **Accessing the Pi + Rasp-Bean OS**
- **(Linux) + basic commands + SSH (Putty/X-Ming)**

SESSION-7: Play with python/Sensors interfacing & coding with Raspberry-Pi GPIO pins (4 Hours)

- **Raspberry-Pi interfacing & python programming:**
- **Multi-session + Playing with python (Arithmetic Conditions + Loops + functions) Analog/Digital Sensor (Input)**
- **interfacing with GPIO's + Actuator (Output) interfacing**

SESSION-8: Smart Home Automation Application on AWS IOT platform (4 Hours)

- **Sign in to the AWS IoT Console**
- **Register a Device in the Thing Registry**
- **Create and Activate a Device Certificate**
- **Create an AWS IoT Policy**
- **Attach an AWS IoT Policy to a Device Certificate**
- **Attach a Certificate to a Thing**
- **Configure Your Device**

SESSION-9: Node MCU ESP8266 (4 Hours)

- **Driver installation on Node MCU**
- **Flashing Node MCU**
- **Configuring Wi-Fi Interfacing & connect to the internet**
- **Connecting Node MCU using IOT Blynk Platform**
- **Web Server implementation on Node MCU**

SESSION-10: Interfacing Raspberry Pi with IBM Bluemix Watson IOT Platform (5 Hours)

- **Connecting Raspberry Pi with IBM Watson: Unregistered Mode**
- **Connecting Raspberry Pi with IBM Watson: Registered Mode**
- **Node red on Pi a Step towards IOT**
- **Connecting Pi as a Gateway with IBM Watson**