

IIOT PROFESSIONAL COURSE DURATION - 06 MONTHS

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

- Introduction to IIOT – An Overview

2) IIOT Overview (Theory) – 3 Hrs.

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

3) Architecture (Theory) – 2 Hrs.

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

4) IIOT World (Theory) – 2 Hrs.

- Overview of IIOT world

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

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

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

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

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

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

8) Embedded Systems (Theory) – 6 Hrs.

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

9) Microprocessors & Microcontrollers (Theory) – 4 Hrs.

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

10) Open Source Hardware Boards (Theory) – 6 Hrs.

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

11) IDE's (Theory/ Practical) – 6 Hrs.

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

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

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

13) Sensors & Actuators (Theory/ Practical) – 10 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

14) IIOT Gateways (Theory/Practical) – 10 Hrs.

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

15) 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,3G, LTE, Wi-Fi, & PLC
- IIOT protocols: MQTT/MQTTs, CoAP, 6LoWPAN, IPSO, TCP, UDP, HTTP/s
- Comparison of the different IIOT protocols, advantages and disadvantages (limitations) of these IIOT protocols
- IPv4 addressing problem for IIOT
- Introduction to IPv6 required to address more devices
- Application issues with RF protocol power consumption, LOS, reliability & Security Aspects

16) 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

<p>16) Design Challenges & Security in IoT (Theory) – 1 Hr.</p> <ul style="list-style-type: none"> - Design challenges in IoT - Security challenges in IoT 	<p>22) Python Programming (Theory / Practical) – 10 Hrs.</p> <ul style="list-style-type: none"> - Introduction to Python - Operators & Data types - Control flow - Files & Modules - Functions & Classes - Database Programming
<p>17) IoT Platforms (Theory / Practical) – 6 Hrs.</p> <ul style="list-style-type: none"> - Introduction to Platforms - Features of IoT platform - Different IoT Platforms available - In-depth explanation of 3 different IoT platforms 	<p>23) Configuration of Raspberry Pi – 4 Hrs.</p> <ul style="list-style-type: none"> - Introduction to Raspberry Pi - Raspberry pi Pin out - Configuring Pi with Raspbian OS
<p>18) End to End Design of IoT Device (Theory/Practical) – 1 Hr.</p> <ul style="list-style-type: none"> - Design of an IoT device overview - Steps to be followed in building IoT device 	<p>24) Configuration of Beagle Bone – 4 Hrs.</p> <ul style="list-style-type: none"> - Introduction to Beagle Bone Board - Beagle Bone pin out - Configuring Beagle Bone with Debian OS
<p>19) Use Cases of IoT (Theory/Practical) – 4 Hrs.</p> <ul style="list-style-type: none"> - Home automation space - Fleet management system 	<p>25) IoT with Python (Theory / Practical) – 4 Hrs.</p> <ul style="list-style-type: none"> - 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
<p>20) Web Services Overview (Theory) – 1 Hr.</p> <ul style="list-style-type: none"> - Introduction to web services - Webservices overview 	<p>26) IoT Use Cases (Theory / Practical) – 10 Hrs.</p> <ul style="list-style-type: none"> - Long range vehicle Detection and Identification - Connected Trash Bins - Employee/ Student Tracking Systems - Smart Street Lights - Smart Agriculture - Home Automation - Environment monitoring system - Health domain - Industrial IoT device
<p>21) RTOS for IoT (Theory / Practical) – 6 Hrs.</p> <ul style="list-style-type: none"> - Definition of RTOS - RTOS Vs GPOS - Features of RTOS - List of RTOS - RTOS for IoT 	<p>27) Project – 40 Hrs.</p>