Internet Of Things (IoT)

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Course Details:

Name	Internet of Things
Course Duration	50 hours
Fees	INR 12,000 (Twelve thousand only)

Gartner predicts: “World will need IOT professional in millions by the year 2020. Anything we buy that costs over $100 will be IoT enabled by 2020. As per Gartner….50 billion devices will be connected to Internet by 2020”

Hence, Kaushalya has launched this IoT BootCamp to enable you to build your Career/Business in Internet of Things.

- ✓ This comprehensive training program gives IT professionals, Industry Professionals, Entrepreneurs, Students, Engineers, Managers and anyone else who wants to make a career in IoT a much needed head start.
- ✓ It provides an End to End knowledge on Internet of Things Ecosystem.The technical pieces covered in this training are: (Software + Embedded Concepts) - Communication Protocols, Cloud, IoT Platforms, Big Data, Analytics, Data Stores, RESTful Web services,LPWAN, IoT Security, IoT Architecture, Sensors, Nodes and Gateways, Development boards, and much more…….
- ✓ Also a deep understanding about Business verticals, regulations, IoT platforms, Alliances, Consortiums and business opportunities is given in this training.
- ✓ This training gives entrepreneurs an opportunity to get started with building their own IoT Solutions

- ✓ Mentoring by IoT/Industry experts with more than 20 years’ experience
- ✓ 50 hours of theory+practical sessions filled with lots of examples and use cases

Objectives of Training

- Provide minds-on and hands-on training
- Understand IoT and its usages
- Learn hardware and software associated with IoT
- Learn end to end IoT prototype development
- Build sample IoT prorotype to solve issues faced by general public

Outcome of Training

- Understand and explore existing IoT products
- Trainees should be able to independently develop IoT applications
- Knowledge on IoT would help them to prepare for placements/switch career.

Syllabus – Basic Course

Module	Topics
Modules 1 – Introduction to IoT and its Architecture	***Introduction*** ✓ What is IoT - In-depth explanation of end to end ecosystem ✓ What is IoT Business? ✓ IoT Applications in different domains ✓ Use cases ranging from Smart Home to Smart Cities ✓ How large is the IoT Market in different domains? ✓ What is Industrial IoT? ✓ Difference between Consumer IoT and Industrial IoT ***IoT Architecture***. ✓ Technology Stack. ✓ Building blocks for Node and gateway ✓ Hardware Development Platforms ✓ Software Development Platforms ✓ Introduction to Communication Protocols ✓ Power Requirements in IoT ✓ Cloud, its components and IoT ✓ Data Streaming and IoT ✓ Data Store and IoT ✓ Analytics & Visualization and IoT ✓ IoT Security ✓ Question and Answers
Module 2 – Sensors and Actuators	***Introduction*** ✓ What is Sensor & Actuator? ✓ What is good sensor? ✓ Sensor properties &their classification. ✓ Types of sensors ✓ Selecting a sensor for your use case ✓ MEMS, RF and Magnetic Sensors ✓ Passive and Active Sensors ✓ Visual sensors & Computer Vision ✓ Application of Sensors

Module 3 – Prototyping using Arduino	✓ Building simple electronic circuits using bread board,battery,LED,Resister, Potentio meter and Buzzar ✓ Introduction to Arduino ✓ Prototyping using Arduino Board ✓ Basic programming ✓ Programming with sensors ○ Temperature and Humidity sensor ○ Ultrasonic Sensor ○ Gas sensor ○ Soil moisture sensor ○ PIR sensor ○ Light Sensor ○ Reed Switch sensor ✓ Programming with Bluetooth module
Module 4 – Prototyping using NodeMCU	✓ Introduction to NodeMCU ✓ Interfacing Sensors with NodeMCU ✓ Programming using NodeMCU ○ Controlling LED using Web Application ○ Controlling LED using Mobile Application - BLYNK
Module 5 – Building IoT Soluton	✓ Introduction to IoT Protocols ✓ Building End to End applications using IoT platform providers such as Adafruit ✓ Use Cases ○ Home Automation ○ Building a Bluetooth Controlled Robot ✓ Assessment

Syllabus – Advanced Course

Module	Topics
Modules 1 – Communication	***Introduction*** ✓ Introduction to communication architecture- Network protocol stack ✓ Different protocols ✓ RF: ZigBee, Blue Tooth, BLE, Zwave, Google Thread and Mesh network.

	✓ Communication Channels: GSM/GPRS, 2G, 3G, LTE, WiFi, PLC • ✓ LPWAN Technologies – 3GPP(Cellular) and Non 3GPP ✓ What is LPWAN? Non 3GPP - LoRa & LoRaWAN, Sigfox, Weightless. 3GPP - NB-IoT, LTE -M Comparison between different RF Technologies ✓ IoT protocols: MQTT/MQTTS, CoAP, 6LoWPAN, like TCP, UDP, HTTP/s. ✓ Comparison of the different IOT protocols, advantages and disadvantages (limitations) of these IOT protocols. ✓ IPv4 addressing problem for IOT and introduction to IPv6 ✓ IPv6 is required to address more devices. ✓ Application issues with RF protocol - power consumption, LOS, reliability. Security aspects
Module 2 – Cloud Computing	***Introduction*** ✓ What is Cloud? ✓ History of Cloud Computing ✓ Advantages of Cloud ✓ IAAS, PAAS and SAAS services ✓ Public, Private and Hybrid Cloud ✓ Introduction to AWS – Amazon web service ✓ Comparison between different Cloud providers like Amazon, Google and Microsoft
Module 3 – Web services	***Introduction*** ✓ What is web service? ✓ Restful web service ✓ Consumption of webservices ✓ GET,POST,PUT and Delete ✓ JSON and XML ✓ Sample programs on development and consumption of web services ✓ Usage of Postman

Module 4 – AWS IoT Cloud Platforms	✓ Introduction to AWS IoT ✓ IAM – User,Groups and Role Management ✓ Certificate and Policy ✓ Usage of CLI ✓ AWS Iot Dashboard ✓ AWS IoT and MQTT.fx ✓ MQTT Subscribe and publish ✓ AWS IoT – Mongoose OS and ESP 8266 ✓ Simple Notification Service (Mail and SMS) ✓ Simple Storage Service (S3) ✓ Streaming data – Kinesis Firehose
Module 5 – Analytics and Visualization	✓ Introduction to big data and analytics ✓ AWS – DynamoDB for data storage ✓ Data Pipeline ✓ Glue – AWS ETL ✓ Quick Sight - Visualization
Module 6 – Building End to end IoT Solution	✓ Building End to End applications using AWS IoT ✓ Use Cases o Home automation o Water quality analysis o Traffic management ✓ Assessment