

# Internet of Things (IoT) Internship

**8 Days 70\* hours Intensive Certified Internship**

**India's biggest ever course work based Internship on  
Internet of Things (IoT) Technologies and  
Application development**

## Internship Structure

No of Days: 8

No of Hours: Total 70 (50 Hands-On Training Hours) + (20 Hands-On Project Hours on Project Assigned)

### What is Internet of Things (IoT)?

The Internet of Things (**IoT**), is the network of physical objects or things **embedded with electronics, software, sensors, and connectivity** to enable objects to exchange data with the production, operator and/or other connected devices.

IoT helps in developing smart real-time industry and domestic applications involving safety, ease of usage, time criticality, entertainment and comfort with the help of Embedded, electronics, software, sensor and communication technologies so it opened up lot of career/entrepreneurial avenues for those who are studying electronics, instrumentation, computer science and IT engineering.

This program will introduce you to the world of IoT technologies and equip you to identify the potential problems and provides a better platform to bring technological solutions. The Internship provides hands-on training to effectively use and customize sensor networks, user interaction modules, data management and device interactions. Participants will understand the essentiality of inter-connected devices through wireless sensor networks and minimize human efforts. Students will get an overview of application deployment the process involved.

### Technologies you learn

- Raspberry Pi
- ESP 8266
- Cloud Platforms – Particle Cloud & UBIDOTS
- Protocols – MQTT
- Firebase – Realtime Database by Google
- Embedded C
- MIT App Inventor
- IFTTT
- Embedded Python - scripting language.
- HTML5 & Bootstrap

## **Day 1: IoT Landscape, Introduction to various allied technologies & Team Formation.**

### **Introduction to IoT**

- What is IoT - In-depth explanation
- IoT Applications in different domain
- How large is the IoT Market in different domains?

### **Introduction to various allied technologies**

- IoT Elements
- Sensor Interfaces
- Sensors and Actuators
- Cloud Platforms
- Real time Database
- IoT Protocols
- Software Development
- Nodes
- Gateways
- Communication Modules - Wired and Wireless
- Servers

### **Team Formation - Problem Statement Allocation**

Internet of Things related industrial problems/Opportunity area will be allocated to participants. Participants will work in a team and present the solution to Industry panelists.

## **DAY 2: Introduction to Tech Geek sessions**

### **Technology geek sessions - 20 Emerging Technology Areas**

- Internet of Things Authentication
- Digital Security
- Licensing and Entitlement Management
- Energy Harvesting
- IoT-Enabled ERP
- IoT Business Solutions
- Things as Customers
- Operational Intelligence Platforms
- Connected Home
- IoT Platform
- Real-Time Analytics
- Embedded Software and Systems Security
- Wide-Area IoT Networks
- Event Stream Processing
- IoT Architecture

- Quantified Self
- IT/OT Integration
- Predictive Analytics
- Smart Transportation
- Wearables
- Low-Cost Development Boards
- Home Energy Management/Consumer Energy Management

## **Each Topic Mentioned Below will have**

Explanation of Concepts – Industry Techniques and Standards – Hands-On Experience

### **Day 3 and 4: IoT technology tools**

- Arduino Programming
- Arduino Sensor Interfacing
- Novel IoT Protocols - MQTT
- Connecting to an Access Point using ESP
- Dual Modes of ESP
- Configuring an ESP
- Data Acquisition and Transfer
- Java based Data Management
- HTML 5 & Bootstrap based UI

### **Day 5: IoT technology tools**

- Sensor Configuration
- Various sensors used in IoT applications
- Raspberry Pi
- R-Pi Architecture
- R-Pi based Gateway Creation
- MIT App Inventor
- MIT App Inventor Interface with Real time Database using IoT Protocols
- ESP Controller interface
- Data Transfer between Mobile and Controller
- Processing based Arduino application development

### **Day 6 and 7 - Hands-on Lab with live projects & Demo**

Participants will get a chance to do various real time IoT applications using various hardware available. Hardwares like Aurdino, Rasperry Pi, Bluetooth or wireless modules and various sensors.

IoT based startup Ideas

Entrepreneurship – Starting IoT based product/services Company.

### **Day 8 - Project Presentation**

Solution/Project presentation – Peer to Peer learning Day – Learn from your other fellow participants about the projects they are working on and vice versa.

- Best Teams will be selected and awarded “Winner of IoT Summer’18” with prizes.
- Best Students who perform well throughout the Program will get “Best Intern Award” and certificate of Excellence.

## Program Benefits

After the program the students should be able to:

- Understand IoT landscape and all emerging areas to develop products
- Understand and build IoT applications
- Implement concepts of UI, data handling and control instructions
- Use native android applications for device control
- Develop processing based interaction modules for controllers
- Develop WSN using ESP
- Deploy IMU in multi-dimensional applications
- Emulate real time IoT application sequence
- Work on safety and automation tasks in daily life
- Conceptualize and develop products using IoT
- Develop confidence of presenting their project/Product
- Inclination towards entrepreneurship and business opportunities

**Note:** Expertshub has all rights to change the structure of the program based upon expert’s availability, equipment’s availability & lab conditions available at host institutions without prior notification to anybody.

\*no of hours mentioned are calculated by both class room training & the time student spend outside the class room for their project work

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