Title : Internet of Things based Smart & Secure Home Automation System

About the Workshop : The explosive growth of the “Internet of Things” is changing our world and the rapid drop in price for typical IoT components is allowing people to innovate new designs and products at home. IoT interfacing between the physical world and Raspberry Pi will be covered in this course. We'll also cover key components of Android Application Development, Website Development and Networking to ensure that the audience understand how to connect their device to the Internet and design a customized control panel.
The workshop is divided into 4 sections.

Outcomes
1) Application of a basic model of Internet of Things
2) Describe the structure of the Internet, Server-Client model & Request-Response model
3) Develop a basic Android Application
4) Using RaspberryPi as the primary device to incorporate IoT
5) Getting familiar with git

Project Briefing
We'll be developing a prototype of a Smart and Secure Home Automation System.
Smart in terms of its control ability over the internet through an Android Application or through a Web Portal.
Secure in terms of its security features like a security-camera and an Intrusion Detection Mechanism.
Basic components like LEDs will be controlled and sensor values would be monitored.

Components / Requirements (NOT for the workshop, but for incase you want to develop the project later)
1) Raspberry Pi (any model)
2) WiFi adapter (for Rpi model < 3)
3) Memory Card (min 8GB)
4) Monitor, Keyboard and Mouse (for first boot of Rpi)
5) LEDs, DHT-11 Temperature and Moisture Sensor, USB Camera
6) Other basic electronic components

Softwares (It would be great if you pre-install the following softwares)
1) Android Studio with Software Development Kit (SDK)
2) XAMPP or any Apache Server for localhost
3) Raspbian OS for Raspberry Pi (if you have the Rpi physically)
4) Putty for TELNET
5) Python IDLE (preferably version 2.7)
6) git

COURSE STRUCTURE

We shall start with git and develop our code base on github.

1) Structure of the Inernet
i) HTML, CSS based Web Portal
ii) Adding some functionality through JavaScript/JQuery
iii) The Server Client Model & the Request-response concept
v) Embed PHP to get things working

2) Android Application
i) Getting started with Android Studio
ii) Adding basic components like Button, Image, CheckBoxes
iii) Activities and Intents
iv) Connecting your Android Application to the Internet
v) Image and Data Parsing

3) Getting Started with RaspberryPi (Hardware)
i) Understanding the board (GPIO, ports, processor etc)
ii) Basic Electronics
iii) Undertanding the Internet Of Things
iv) Connecting the LED, Sensor and Camera to Rpi

4) Getting Started with RaspberryPi (Software)
i) Booting and Setting up RaspberryPi
ii) Linux Basics (permissions, file access and GUI)
iii) Installing required softwares / plugins
iv) TELNET setup to control RaspberryPi over SSH / LAN
v) The Python Language
vi) Coding the RaspberryPi

Notes -
1) If you want hands-on experience with raspberry pi, please get the board yourself. Nothing to worry if you do not have a board.
2) Arrange for an internet connection because we cannot trust ION. (Jio hotspots would be great)
3) Getting the softwares pre-installed will help us save time and conduct the workshop more efficiently.
4) **No prerequisites** expected.