

1 WEEK NATIONAL LEVEL WINTER TRAINING ON IOT using Raspberry Pi



Hands-On Sessions on IOT using Raspberry Pi Projects

Raspberry Pi Kit to all Team of 2 members worth of Rs.5000/

Get Certification from NWTP-2016 association with Cognizance Cell IIT-Roorkee

Internet Of Things using Raspberry Pi

Objective:

Internet of Things, or IoT in short, is the idea of making devices and objects smarter by linking them to the internet.

This workshop introduces you to the amazing world of IoT and its fascinating applications. Using a Raspberry Pi computer and a DHT sensor, you will develop an electronic device that streams temperature and humidity data over the internet. You can program the system in such a way that say whenever the temperature exceeds a certain limit, the device will automatically send an email notification!

Workshop Outcomes

- Learn the basics of Internet of Things and its applications
- Build your computer using Raspberry Pi platform
- Work with DHT sensors to detect humidity and temperature
- Setup IoT connectivity using a remote desktop
- Understand Raspbian OS, Python programming, SMTP and API
- Develop and test an IoT weather monitoring station

Kit Content

- Raspberry Pi B+ model
- DHT Sensor
- Resistor
- Breadboard
- Connecting wires
- Ethernet cable(LAN) and MicroUSB cable*
- microSD memory card and SD memory card adapter

All the above components would be provided during the program to participants in groups of 2 but would be taken back at the end. If participant want to buy then cost will be Rs5000/-per kit

1-week IOT Workshop Outcomes

What is IOT?

Learn: IoT - an Introduction?

Learn: IoT for Weather Monitoring?

Review: What is IoT?

Build your computer using Raspberry Pi

Learn: What is Raspberry Pi?

Do: Raspberry Pi Board

Do: Installing OS on your Raspberry Pi?

Sense Temperature and Humidity

Learn: Sensors

Learn: Temperature and Humidity Sensors

Do: How to work with DHT 11 Sensor

Review: How to sense Temperature and Humidity

Establish Remote Desktop Connection

Do: Internet Sharing from PC to Raspberry Pi

Do: Setup SSH connection using Putty

Do: Remote server access using VNC server

Raspbian OS

Do: Tools and Applications - An Introduction

Python Programming

Learn: An Introduction

Simple Mail Transfer Protocol

Learn: An Introduction

Do: Installation in Raspberry Pi

Do: Send simple Gmail - Python Programming

Application Programming Interface

Learn: An Introduction

Building IOT Weather Station

Do: Connecting DHT 11 sensor with Raspberry Pi

Do: Programming the Raspberry Pi for IOT

Testing

Do: Testing the IoT device

1-Week IOT using Raspberry Pi Course Contents

Day 1

Introduction to Raspberry Pi

- Different Models of Raspberry Pi
- Why Raspberry Pi.
- Peripherals of Raspberry Pi.
- Applications of Raspberry Pi.
- Future of Micro Computing.

Day 2

Preparing Your Raspberry Pi for First Use

- Different Operating Systems for Raspberry pi.
- Getting Started With NOOBS
- Getting things ready for first use
- NOOBS OS inside out
- Booting for the First time.

Day 3

Introduction to Microcontroller

- Diff B/w Microcontroller and Microprocessor
- Introduction to Raspberry Pi
- Architecture and Hardware specifications
- Introduction to ARM
- GPIOs

Introduction to Programming:

- Introduction to Scratch Programming
- History and basic of Scratch
- My first program on scratch
- Led Blinking using Scratch

Day 4

Introduction to Python programming Language

- History and Basic of Python
- My first program on scratch
- Led Blinking using Scratch

Interrupts

- Interrupt concept
- NVIC on Arm Cortex M4.
- Edge Trigger and SysTick Interrupt.
- Writing Interrupt Service Routine

Day 5

Setting Up for a Perfect Pi Experience

- Operation Procedures.
- Updating Pi to Latest software's.
- Setting various Options and Personalizing.
- First introduction to the LINUX terminal.
- Introduction to the Open Source Software Library.

Introduction to LINUX Environment

- The Linux Organization Structure.
- LINUX Shell.
- SHELL Scripting.

Day 6

Getting Familiar with the GPIO Pins of your Pi

- Pin numbering Formats
- The Voltage hazard Information.
- The LED Interfacing.
- The First Button Interface with Raspberry Pi.
- General information on other pins and their functionality

Day 7

Hands-on session will include

- Setting up Raspberry Pi
- Flashing the loading the SD card with the OS
- Booting the OS
- Intro of items on the desktop (Debian Linux/ Wheezy)
- Enabling GPIO pins
- LED interfacing using the GPIO

Get 1-week Training Certificate from NSTP-2016 Association with ED Cell IIT-Roorkee

1. Certificate of Participation from NWTP-2017, Cognizance IIT Roorkee.
2. Certificate of merit from NWTP-2017 Cognizance IIT-Roorkee.
3. Certificate of Coordination from NWTP-2017 Cognizance, IIT-Roorkee.
4. College will get Center of Excellence form NWTP-2017 Cognizance IIT-Roorkee.

What are the other requirements for this training program?

- Seminar hall/classroom having the enough capacity to conduct hands-on-session for all participants.
- Good Quality public address system ideally two cordless mikes will be required.
- Projector/ Screen along with black/white board for teaching and presentation purposes.
- This training center can only be arranged for a minimum of 50 students
- 1-week Accommodation to our IOT Expert

Training Duration: 1-week (3-4 hours each day)

Training Fee:

One-week Training	Registration Fee
IOT using R-Pi	Rs.4200/-per attendee

(The fee includes service tax, training, certification, and Event registration and a **taken away IOT Kit to each Team of 2 members,**)