

AG Groups:

- Active Galaxy (An Engineering Idea), Chennai
- M.Phil Project center (A Research Institute for M.Phil / PHD), Chennai
- IJADST (International Journal)
- AG Welfare Association, Chennai



IOT Hands-On Training Workshop (2Days)

Internet of things becomes more popular in recent days, and it is simply called IOT (Internet of Things) it offers remote monitoring and controlling. We can access remote place and its parameter lively with help of internet connectivity. Basically IOT run with GSM, Wi-Fi, Ethernet interfaces that depend on the module. Mostly wireless sensor network works with IOT concepts.

Requirements for Training

- ✓ Seminar hall/classroom having the enough capacity to conduct hands-on-session for all participants.
- ✓ Projector/ Screen along with black/white board for teaching and presentation purposes.
- ✓ One small stereo jack cord connects to laptop for its sound system.

Certificate Distribution

- ✓ Certificate of Participation from Active Galaxy to each participant
- ✓ Certificate of Coordination from Active Galaxy for all of the coordinators

Benefits to the participants

- ✓ Learn & Interact with renowned Industry Experts.
- ✓ It will help to develop their career life.
- ✓ Complete learning about basic electronics works (How stuff works).
- ✓ Hands on IOT system experience.

Benefits of association with us

- ✓ College Name and Logo including website link will be published on our official website.
- ✓ We will help to develop R&D lab in your college/university.

AG Groups:

- Active Galaxy (An Engineering Idea), Chennai
- M.Phil Project center (A Research Institute for M.Phil / PHD), Chennai
- IJADST (International Journal)
- AG Welfare Association, Chennai

Course structure

Overview

Embedded systems introduction & Software installation

Introduction to Embedded System

- ✚ Introduction to Embedded System
- ✚ Applications & Scope of Embedded System in various industries
- ✚ Embedded system Vs Non-Embedded system

Introduction to Open Source platform

- ✚ An Overview of Open source platform
- ✚ Arduino Board Description

Introduction to Microcontroller

- ✚ This session would deal with the basics of Microcontroller. The focus will be on the AVR Micro controller, which is one of the most powerful and widely used 8 bit microcontrollers.
- ✚ Overview of Microprocessor / Microcontroller
- ✚ What is Microcontroller?
- ✚ Microcontroller architecture and Interfacing
- ✚ Introduction to Microcontrollers & the Arduino Platform
- ✚ How can we use microcontroller in our circuits

Introduction to Programming Language

- ✚ Programming Languages- Assembly Vs Embedded 'C'
- ✚ Microcontroller Programming using Embedded 'C'
- ✚ Basics of development board, IDE, Debugger, Flash programming

Introduction to software tool chain

- ✚ Software Installation
- ✚ Getting started with the Arduino IDE to start writing your first program
- ✚ Writing your First 'Embedded C' Program
- ✚ Software installation (Individual Laptop/batch)

IDE tool = Arduino

Simulation tool = Proteus PCB Design & Simulation software

System Requirement form participants

- ✓ Windows 7 OS, Min 2GB RAM, Min 120GB hard disk space
- ✓ Any latest version processor & Min 16GB pen drive

AG Groups:

- Active Galaxy (An Engineering Idea), Chennai
- M.Phil Project center (A Research Institute for M.Phil / PHD), Chennai
- IJADST (International Journal)
- AG Welfare Association, Chennai

Day -1 (Session -I)

Hands on training in GPIO interface (Real-time hardware implementation)

- ✚ **Experiment 1 : Single GPIO access**
 - ✚ Single port register access - Single LED toggle
- ✚ **Experiment 2 : Multiple GPIO access**
 - ✚ Full port register access - Bar graph LED toggle
- ✚ **Experiment 3 : 7-Segment LED display interface**
 - ✚ Single port register access method - 7-Segment display
- ✚ **Experiment 4 : 7-Segment LED display interface**
 - ✚ Full port register access method (Hexadecimal method)
- ✚ **Experiment 5 :Button interface**
 - ✚ Digital input sensing – Push button interface
 - ✚ Pull-Up logic & Pull-Down logic
- ✚ **Experiment 6 : Test task**
 - ✚ Combination of Digital input and output
- ✚ **Experiment 7 : 16*2 LCD interface**
 - ✚ 4bit data mode & Scrolling display
- ✚ **Experiment 8 : 16*2 LCD interface task**
 - ✚ Increment counter & Decrement counter
- ✚ **Experiment 9 : ADC on LCD**
 - ✚ Variable resistor (analog input reading)
 - ✚ 10Bit ADC calculation and resolution talk
- ✚ **Experiment 10 : LM35 temperature sensor interface**
 - ✚ LM35 interface
 - ✚ Sensor calibration & Sensor sensitivity calculation
- ✚ **Experiment 11 : Test task**
 - ✚ Combination of ADC and LCD task

Day -1 (Session -II)

Hands on training in serial interface (Real-time hardware implementation)

- ✚ **Experiment 1 : HW/SW Serial port initialize**
 - ✚ 9600 baud rate, 8-Bit data, No parity, 1-stop bit configuration
- ✚ **Experiment 2 : Serial communication method**
 - ✚ Synchronous Serial Programming

AG Groups:

- Active Galaxy (An Engineering Idea), Chennai
- M.Phil Project center (A Research Institute for M.Phil / PHD), Chennai
- IJADST (International Journal)
- AG Welfare Association, Chennai

✚ **Experiment 3 : ADC on serial port**

- ✚ Sensor data on serial port

✚ **Experiment 4 :Hand shacking serial port**

- ✚ Serial port request and acknowledgement method

✚ **Experiment 5 : Test task**

- ✚ Sensor HUB design task

Day -2 (Session -I)

Learning of HTML

- ✚ Introduction about WWW

- ✚ Overview of HTML

✚ **Experiment 1 : Basic IOT commands**

- ✚ Heading Tag & Paragraph Tag
- ✚ Table Tag & Image Tag
- ✚ Link Tag & Color code
- ✚ Basic webpage design & Link two website

✚ **Experiment 2: Web server designing**

- ✚ Sensor data on web page & Local hosting
- ✚ Push button on webpage
- ✚ Edit text box on webpage

Day -2 (Session -II)

Learning of SPI & Ethernet

- ✚ Introduction about SPI

- ✚ Overview of JAVA Basic

✚ **Experiment 1 : Basic cloud creation**

- ✚ Sensor value display
- ✚ IOT based light control
- ✚ IOT based Motor control

✚ **Experiment 2: Web server designing**

- ✚ Sensor data on web page & Local hosting

✚ **Experiment 3: Project creation**

- ✚ On spot project concept (APK Based control)

AG Groups:

- Active Galaxy (An Engineering Idea), Chennai
- M.Phil Project center (A Research Institute for M.Phil / PHD), Chennai
- IJADST (International Journal)
- AG Welfare Association, Chennai

Workshop training kit includes

S.No	Component name	Qty
1	Arduino Uno R3	1
2	USB A to B cable	1
3	IOT shield	1
4	Male to Male jumpers	20
5	5mm LED, 330E resistor	set
6	LM35 temperature sensor	1
7	Buzzer	1
8	Power supply components	Set
9	Wires	As per requirement.
10	File, Notepad, Pen	set
11	Kit box & manual	1