**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**

ACTIVE GALAXY
AN ENGINEERING IDEA

# Robotics workshop (2Days)

Robotic becomes more popular in last two decades, because of its advantages over traditional methods. Robotics provides faster, accuracy, easier operation in industrial handling. It is not a separate domain; it's a combination of multiple departments like mechanical, electrical and instrumentation, etc.

### *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 Robotics experience.

### *Examples of some hands on robotic experiments:*
✓ Android app based Bluetooth controlled robotics.
✓ (Wireless) Zigbee controlled robotics.
✓ (Wired) Land rover robotics.
✓ Sensor based robotics.
✓ Line follower robot & Pick and Place robot.

# Course structure

## Day 1 (5~7 hours)

### Session 1:

### 🔸 Embedded systems introduction

- ✓ Introduction about technology
- ✓ Embedded system Vs Non-Embedded system
- ✓ Current trends in technology
- ✓ Future scope
- ✓ Overview of Microprocessor / Microcontroller
- ✓ Overview of open-source platform (Arduino)
- ✓ Basics of development board, IDE, Debugger, Flash programming

### Session 2:

### 🔸 Robotics introduction

- ✓ Robotics & its evaluation
- ✓ Asimov`s law of robotic
- ✓ Parts of robotics
    - ✓ Basic Electronic Components
    - ✓ Fundamental Electrical Concepts
    - ✓ Sensors
    - ✓ Interfacing of Sensors
    - ✓ Motors and Controlling Circuit
    - ✓ Interfacing of Motors

### Session 3:

### 🔸 Software Installation and Programming

- ✓ Digital input and output (GPIO) access - LED toggle
- ✓ DC motor control
- ✓ Serial communication interface
- ✓ Bluetooth protocol interface
- ✓ Relay interface
- ✓ Buzzer interface
- ✓ Simulation checking

## Day 2 (5~7 hours)

### Session 1:

#### ⯵ Hardware Assembling
- ✓ Making robot chassis & connecting motor driver & connecting motors
- ✓ Wheel fixing & sensor attaching
- ✓ Bluetooth interfacing & Arduino board connection
- ✓ Making screws & and other part assembling

### Session 2:

#### ⯵ Program Flashing
- ✓ Compiling program & Uploading HEX file to hardware
- ✓ Logical implementation
- ✓ Software debugging & Hardware debugging
- ✓ Bluetooth paring and checking connectivity & Command testing

### Session 3:

#### ⯵ Real-time testing
- ✓ Bluetooth command based robot operating
- ✓ Making asynchronous serial communication
- ✓ Robot forward, reverse, left, right control
- ✓ Relay command implementation
- ✓ Buzzer testing with commands
- ✓ Full functionality checking

### Session 4:

#### ⯵ Robot competition
- ✓ On spot logical task in robotics
- ✓ Time level completing task
- ✓ Performance evaluation

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# Workshop training kit includes

| S.No | Component name | Qty |
|------|----------------|-----|
| 1 | Arduino Uno R3 | 1 |
| 2 | USB A to B cable | 1 |
| 3 | Robot chassis | 1 |
| 4 | Male to Male jumpers | 20 |
| 5 | Robot wheel & no gear wheel | 2 |
| 6 | DC gear motor | 2 |
| 7 | L293D motor driver | 1 |
| 8 | Bluetooth | 1 |
| 9 | Relay board | 2 |
| 10 | DC lamp/LED | 2 |
| 11 | Buzzer | 1 |
| 12 | Power supply components | Set |
| 13 | File | 1 |
| 14 | Notepad | 1 |
| 15 | Pen | 1 |
| 16 | Kit box & manual | 1 |
| 17 | Wires | As per requirement. |
| 18 | Android app | Downloadable |
| 19 | Wire Tape | 1 |
| 20 | Double side tape | 1 |
| 21 | Robotic manual | 1 |

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