1 day hands-on workshop

Into The World Of Robotics

Rovering Smarter

Hi **there**!

"Robotics and other combinations will make the world pretty fantastic compared with today"
– Bill Gates

The world will be more connected than ever before in the coming years with IoT innovations. People are already dependent on technology for assisting them in doing their daily tasks. In the future, **IoT will become more important and difficult to disconnect**, partly because companies configure them in such a manner. From farming fields to controlling everything in our homes!

Workshop **Overview**

Curious to build your own mobile robot and control them? This workshop is for you.

This session will cover everything from scribbling your idea to implementation of your own robot. Prior knowledge in electronics, coding and robotics is not mandatory .

⏰ | **Time taken to complete the workshop** ——— 6 hours
1 day of hands-on workshop

Getting **Started**

This workshop is divided into 5 phases.

Day 01	Phase 00 **Walkthrough**
Day 01	Phase 01 **Introduction to Arduino Platform**
Day 01	Phase 02 **Hardware Introduction**
Day 01	Phase 03 **Basics of Robotics**
Day 01	Phase 04 **Development and Implementation of Robotics**

Workshop **Plan**

Phase 00
Day 01 / **Walkthrough**

01
Industrial Revolution
A glimpse to the past evolutions of technology

02
Industry 4.0
Where are we now?

03
Introduction to Robotics
An overview and introduction to Robotics

04
Role of Robotics
Discussing the roles of Robotics in the modern world

05
Scope of Robotics
What is the current scope of Robotics?

06
Applications and Functions of Robotics
What are the applications and functions of Robotics?

07
Industry 5.0+
A glimpse to the future technology evolution

08
Future scope of Robotics
An evaluation of Future scopes of Robotics

Workshop **Plan**

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Phase 01

Day 01 / Introduction to Arduino Platform

01
Introduction to Arduino
An introduction to Arduino Development Platform

02
Introduction to Arduino IDE
An introduction to Arduino IDE Platform

03
Introduction to Arduino Development Boards
An introduction to Various development boards

04
Download Arduino IDE
How to download Arduino IDE

05
Installing Arduino IDE
Installation process of Arduino IDE

06
Setup Arduino IDE
Learn how to setup Arduino IDE

07
Install Libraries and boards
Learn how to install libraries and development boards

08
Programming Basics
Basics of Arduino Programming

Workshop **Plan**

Phase 02
Day 01 / **Hardware Introduction**

01

Breadboard

Know about breadboard connections and specifications

02

Input Devices

Working & outline of various digital and analog input devices

03

Output Devices

Working & outline of various digital and analog output devices

04

Development Boards

Know more about Arduino dev boards and ESP boards

05

Getting ready

Connecting & setup development board with computer

06

Basic Uploading

Uploading a basic example code to a development board

Workshop **Plan**

Phase 03
Day 01 / **Basics of Robotics**

01
Reading Inputs
Reading digital and analog inputs from various sensors

02
Writing Outputs
Writing outputs to various actuators and other devices

03
Assigning Functions
Assigning variable functions and controlling

04
Power Distribution
Familirazing power distribution systems

05
Integrating Systems
Setting up and integrating various systems to perform a task

06
Ideate
Ideate and propose a robotic project

Workshop **Plan**

Phase 04
Day 01 / **Development and Implementation of Robotics**

01

Circuits

Design circuit for the proposed project

02

Programming

Design, Edit, Compile and Upload the code

03

Troubleshooting

Troubleshooting errors on software and hardware side

04

Implementation

Implementation of the Robot (the proposed one)

05

Power on!

Power up the robot developed and work

List of Components

Sl. No.	Item	Specification	Nos
01	Arduino Development Board	UNO	01
02	USB Cable	Type A - Type B	01
03	Bread Board	Standard [840 TP]	01
04	Jumper Wires	Male - Male	25
05	Jumper Wires	Male - Female	20
06	Jumper Wires	Female - Female	15
07	SMPS	12V / 1A	01
08	Voltage Regulation Module	5V / 12V (7805)	01
09	LED	Red	02
10	LED	Green	02
11	LED	Blue	02
12	LED	RGB	01
13	Buzzer	5V / Piezo	01
14	Switch	Push Button	02
15	Resistor	220 Ω	05
16	Resistor	1 KΩ	05
17	Resistor	10 KΩ	05
18	Capacitor	104	04
19	Potentiometer	10 KΩ	01
20	Joystick Module	2 Axis, 1 Button	01
21	Light Sensor	LDR Module	01
22	Proxy Module	Active Infrared	01
23	PIR Motion Sensor	HC - SR501	01
24	Ultrasonic Sensor	HC - SR04	01
25	Temperature Sensor	DHT11	01
26	Bluetooth Module	SF90 Micro Servo	01
27	Relay Module	5V / 2 Channel	01
28	Servo Motor	SF90 Micro Servo	01
29	BO Motor	12V	04
30	Motor Driver	L293D	01
31	Wheel	Stantard Robotic Wheel	04
32	Robotic Chase	4 Wheel Chase	01
	Battery	12V / 2200 mAh	01

*Minimum required for each group

*Minimum 1 system is required per group

Training **Requirements**

Lab Requirements

- Individual systems for participants
- Systems should be networked and have internet connectivity
- Shared folder to access common contents
- Projector and screen
- Whiteboard and marker

System Requirements

CPU	• 1.6 GHz or above - Intel / AMD
Ram	• 2GB or above
Operating System	• Windows 7 / 8 / 10 Ubuntu 14.04 or above
Web Browser	• Google Chrome / Mozilla Firefox
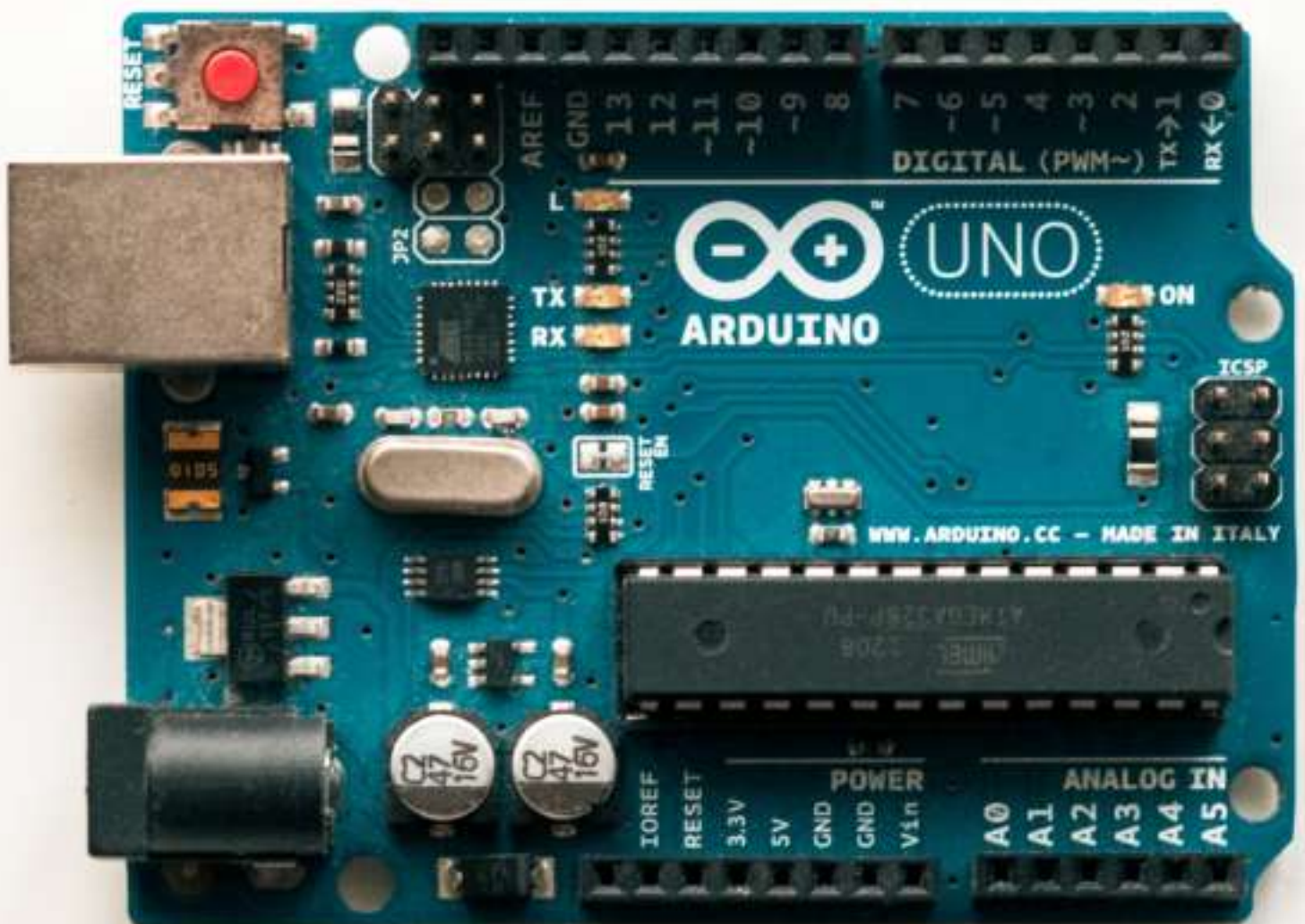
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Thank You!

More info on this is available at **www.riglabs.co**