ARUDINO

For the 1st time in India, introducing khb on ARDUINO, an EEG (Electroencephalography) & microcontroller based robotics workshop by **ARK Technosolutions**. Here you will get the opportunity to learn the art of making robots which are controlled by the signals coming from your mind. This workshop teaches you the fundamentals of **brainwaves** and their applications in today's world. This workshop will also provide guidance in the field of integrating **Brainwave technology and Robotics** (which generally involves a microcontroller, actuators, power supply, etc.) It also focuses on conceptualization and designing of complex systems in order to harness the power of mind in the form of brainwaves. This workshop will also help clear concepts related to embedded systems, artificial intelligence and automation.

Apart from the theoretical sessions, participants would be working on autonomous robotics kit specially designed by **Team ARK**. This kit includes, microcontroller based board, sensors, actuators etc. Hands on sessions on this kit will help the participants to enhance their embedded C programming, PC hardware interfacing skills and above all, the confidence of going beyond imagination and constraints of technology in modern times.

What will you learn after attending the work shop:-
+ Details on EEG based instruments.
+ Details on microcontroller
+ Programming the microcontroller using ARDUINO Interface
+ Interfacing and controlling various devices like LED, motors, sensors etc with Microcontroller
+ Use of wireless devices such as a wireless Bluetooth module for different interface control
+ Making of various types of robots, their algorithms and coding
+ Application of micro controllers in industry, military, medical, home Appliances, home automation etc
+ Use of brainwave sensors and it's application

The Robots Can be made using this kit:-

+ Mind controlled Robot**.**
+ Speed control based on **Mind Waves**
+ Attention measurement
+ Meditation measurement
+ Blink controlled Bot
+ Wireless controlled Bot
+ PC controlled Bot

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The concepts to be covered are:-

- Types of Brainwaves
- Sensors to record Brainwaves
- Types of Autonomous Robots
- Wireless Communication
- Elements of an autonomous robot
- Microcontroller based robots
- Pre programmed robots
- Self learning robots

Microcontroller

- Overview of available microcontrollers
- The ATMEGA series of micro controller and its core
- Its features and capabilities

Programming of IDE

- Use of ARDUINO Software
- Writing code
- Accessing various functions of micro controller
- Implementation of various algorithms
- Implementation of artificial intelligence

Actuators

- DC Geared motors
- Stepper Motors
- Servo Motors
- Motor Drivers
- Electromechanical: Relays
- Solid-state drivers: H-bridge, IC drivers

Sensors

- EEG based Sensors
- Light: LDR, photodiodes, phototransistors
- Heat: Thermostats
- Sound mike
- Ultra-Sonics
- Mechanical touch sensors

Power Supplies

- AC adaptor
- Different types of batteries

Significance of Brainwave Technology:

A Human Brain being the most complicated computer in the world, studying its behavior in different scenarios can lead to breakthroughs that transcend all fields of technology. Be it the Medical or Robotic applications, their possibilities are endless.

What is Arduino?

Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use Hardware and Software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments.

Duration:
We conduct workshops on 2 consecutive days, each day 8 hours session so in total 16 hours properly divided into theory and hands on sessions. In the end we organize a small competition

Among the participants of the workshop so that the students get the real feel of competitive environment. Winner of the competition will be awarded with certificate of merit & other prizes

KIT Content of Brain Wave Control Robot on ARKDUINO

<mark>None Take Away</mark>

Wireless Bluetooth Mindwave headset

<mark>Take Away</mark>

ARKDUINO circuit board
1 Bluetooth Module
1 Bluetooth Modem
Micro Controller - ATMEL ATmega 32
- Operating Voltage - 5V
- Input voltage - 6V-20V
- Digital I/O pins - 14 out of which 6 provide PWM
- Analog Input Pins - 6
- DC Current per I/O pin - 40mA.
- Flash Memory - 32KB
- SRAM - 1KB
- EEPROM - 512Bytes
- Clock Speed 16 MHz
- USB-UART converter
- Proper Indicator LED's
- USB/ EXT input voltage
- 5V output supply pins - 3
- 3.3 V output supply pins - 1
- Breadboard Compatibility (dimension of a 40 pin DIP IC)

ACRYLIC Multipurpose Robot Chassis
Plastic Wheels
DC Motors.
360' Castor Wheel
Battery (9v)
A to B USB Cable for Programming
Connecting Wires
Screws
Screw Driver
Battery snaps
CD containing Course Material & Mindwave software (Codes, Software's, videos etc)