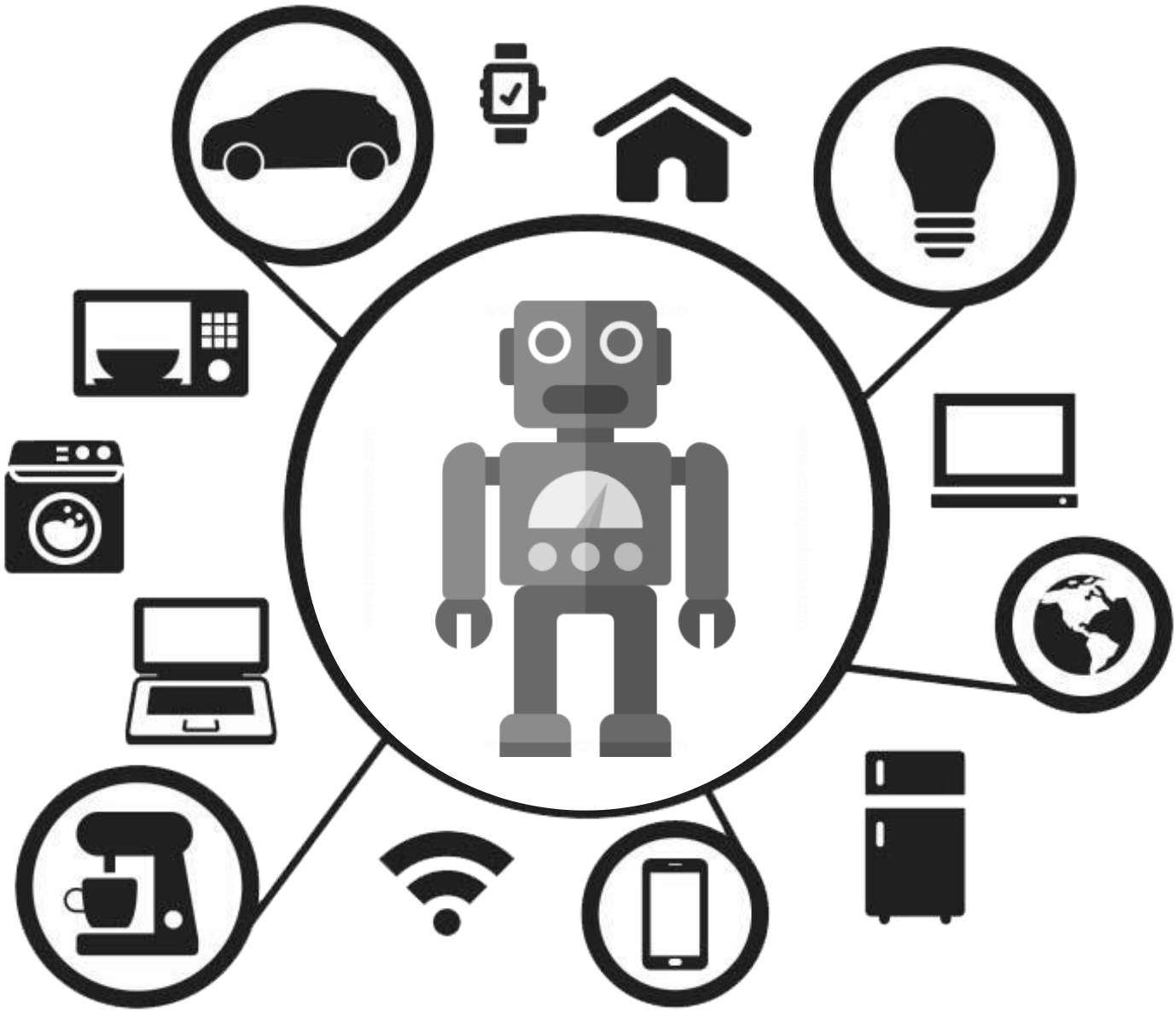


ROBOTICS & IOT

Workshop Module

CURRICULUM STRUCTURE

DURATION: 2 day (16 hours)

Session 1

Let's Learn Embedded System & Robotics

Description

Under this topic, we will discuss basics and give brief idea about Embedded System & Robotics

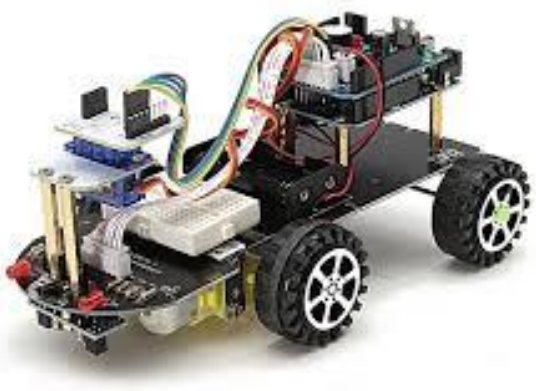
Duration: 1 Hour

Technical Content with Duration

- Introduction of Embedded System
- Introduction of Robotics & Robots
- Use of Embedded & Robotics
- How we are in connecting this with Real life/World

Your learning after this session

After completion of this section students will get a basic idea about Embedded System, Robotics and Robots.



Session 2

Let's Start Arduino

Description:

Under this topic, we will cover how to install Arduino Software. Use of Arduino user interface. Types of

Duration: 1 Hour

Technical Content with Duration

- Introduction to Micro-controller.
- Difference between AVR, 8051, PIC and Arduino.
- Introduction to Arduino platform.
- Install Arduino Software on laptop.
- Use of Arduino IDE
- Make your 1st Sketch

Your learning after this session

After completion of this section students will aware with Micro-controllers, Arduino IDE and able to do sketch.

Session 3

Explore Arduino for Automation/Robotics

Description:

This topic will introduce the students how to Blink LED, use of Switch, Arduino Serial. Operate Relay, make automation and robotics project.

Duration: 6 Hours

Technical Content with Duration

- Blink LED Using Arduino.
- Use Switch to Blink LED in different pattern.
- Interfacing IR
- Interfacing Sound Sensor
- Interfacing motor
- L293D IC
- Use of serial monitor.
- Display value of Sensor on serial monitor
- What is automation?
- Run relay from Arduino.
- Run motor from Arduino.
- Make a robotics project *(Line follower or Obstacle detector or obstacle avoider)*
- Make an automation project *(light operated relay or automated light control system)*

Project to be covered:

- LED's Patters
- Digital Counter Using LED's
- Display the Current Strength of Cinema hall on LED's
- Line Follower Robot
- Edge Avoider Robot
- Wall follower Robot
- Obstacle Avoider Robot

Your learning after this session

The pupils will learn how to work on micro-controller. Control input and output from micro-controller. How micro-controller interact with PC. Last but not least make one automation system to operate home appliances and old & trusty line follower or obstacle avoider.

Session 4

Introduction to Serial Communication

Description:

Covering this topic will teach the students to use basic operations of Serial Communication between Embedded System to Laptop/Mobile

Duration: 2 Hours

Technical Content with Duration

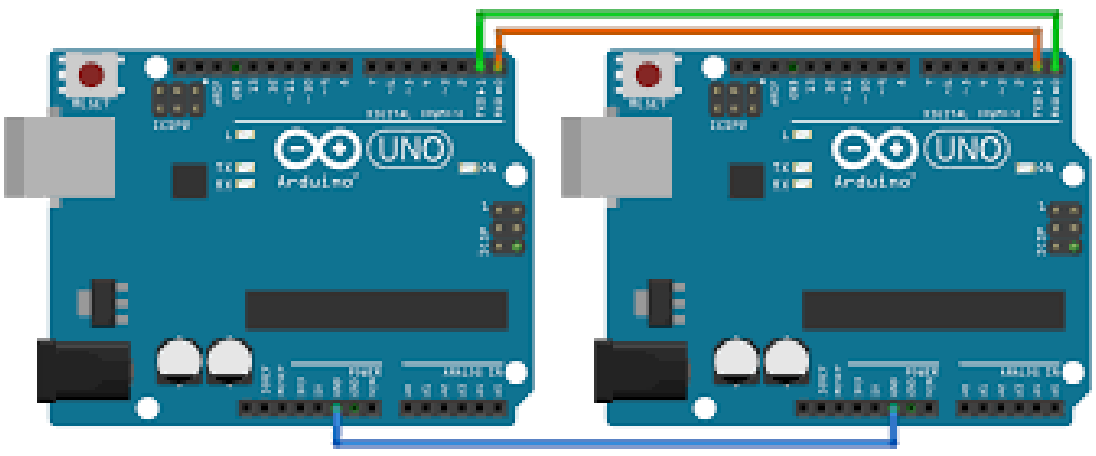
- USART Introduction.
- Initialization of USART.
- Sending data by Serial communication.
- Receiving data by Serial communication.

Project to be covered:

- Controlling Bot through Mobile App. (Android App.)

Your learning after this session

After covering this section students will get the idea about Communication (Serial /Parallel) and control bot through mobile app.



Session 5

Working and Connection

Description:

In this Section we will cover high voltage switching device and that is Relay

Duration: 1 Hour

Technical Content with Duration

- Basic of Relay
- Interfacing of relay with bot

Project to be covered:

- Control High Voltage Operated Devices Using Relay

Your learning after this session

After covering this module students will easily control high voltage devices (Like: all home appliances) through logic generate by bot that means they will be able to make smart home.

Session 6

Connect to Web Server through Arduino.

Description:

This module will teach the students how to Establish Connection with Website and fetch data to perform automation through Arduino.

Duration: 2 Hours

Technical Content with Duration

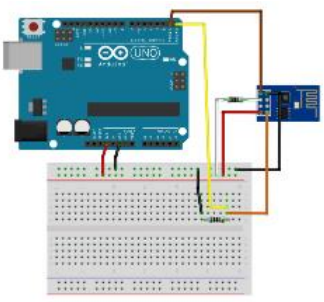
- Interfacing WiFi module with Arduino.
- Use of Serial Monitor
- Connect to WiFi from Arduino.
- Connect to website from Arduino.
- Receive data from web server on Arduino.
- Interface with Bot

Project to be covered:

- Controlling Arduino Embedded System through Web Server.
- Controlling Home Appliances Using Wifi
- Controlling Bot Using WiFi Module Through Web Server

Your learning after this session

Here students will able to do and control all home appliances and bot through Internet (Through Web page) and basic idea regarding how to design web page using HTML and php.



Session 7

Introduction to Blue-tooth Module (HC-05/HC-06)

Description:
Here we will teach the students how to use basic operation of Serial Communication between Embedded System and Blue-tooth Device

Duration: 2 Hours

Technical Content with Duration
- Introduction of Blue-tooth device
- Interface with Bot

Project to be covered:
- Controlling Bot Using Bluetooth Device Through Mobile
- Controlling Home Appliances Using Blue-tooth

Your learning after this session
After this section students will get the idea about controlling Bot through Blue-tooth in its range.

Session 8

Introduction to WiFi Module (ESP8266)

Description:

Hardware description to WiFi module and basic interface.

Duration: 1 Hour

Technical Content with Duration

- Introduction to WiFi module (ESP8266)
- AT command Set for WiFi module.
- Connect to WiFi Network

Your learning after this session

Here students will get the idea about wife module and its connections with bot.