Workshop content of Line Following Robotics

Objective:

This workshop helps participants to understand the concepts and designing of Robot which involves study of Robotics, Microcontroller, Sensors and Actuators etc.

Session 1: Introduction to Robotics

- Introduction to Robotics
- Robotics and its application
- Definition, of the Robots
- Future of Robotics
- Basic Parts for build a robot
- Mechanical Structure
- Power Supply
- Motors
- DC Motors: Construction & Characteristics

Session 2: Basic Electronics

- Basic Electronics Component
- Fundamental of Electronics Component
- Resistor
- Transistor
- Capacitor
- Diode

Session 3: Motor Driver Using H-Bridge

- DC Motor Drivers
- H-Bridge Motor Driver
- Working of H-bridge & Concept
- L293D Motor driver IC
- Internal Circuit of IC
- Hands on Session for H-Bridge interfacing

Session 4: Sensors

- Introduction to Sensor
- Types Of Sensors
- Working principle of IR Sensor
- Op-amp
- Circuit of IR Sensor

Session 5: Introduction to microcontroller

- What is microcontroller?
- Difference Between microcontroller & microprocessor?
- Introduction to ATmega 8 /16 microcontroller
- Architecture of the AVR Microcontroller
- RISC v/s CISC
- How can we use an own microcontroller in our own circuit?
- Pin description of the microcontroller
- How to use I/O of the microcontroller

Session 6: Introduction to Embedded C Programming

- Embedded C Programming for the Microcontroller
- Introduction to AVR Studio and WinAVR
- Introduction to C ,Flow Control and function
- Program structure and debugging
- How to program a microcontroller?

Session 7: Embedded Projects implementation & testing

- Writing and burning Black Line follower Program
- Testing and debugging Black Line follower Program
- Writing and burning Obstacle Avoider Program
- Testing and debugging Obstacle Avoider Program
- Writing and burning Edge Avoider Program
- Testing and debugging Edge Avoider Program

Session 8: Certificate Distribution