New Enhanced
PROJECT BASED TRAINING IN ROBOTICS

Introduction
The course involves making of a robot from scratch. During the workshop you will be exposed to programming in 8051 Microcontroller. At the end of the workshop you would have constructed your own robot. The workshop clears concepts related to embedded systems, artificial intelligence, robotics and automation. Students interested in participating in Robotics competition always join the workshop.
Prerequisites: Basic C programming

Module 1
Hardware Fundamentals
Basic Electronic
Digital Electronic
Introduction to Microcontroller
Brief introduction of Microcontroller
INTEL, Philips, AVR, Microchip
The 8051 Architecture
Hardware Details
8051 Registers
Memory Organization
Port Organization
On Chip Peripherals
8051 Interrupts
Instruction Set
Addressing Modes
Programming Languages
Programming The 8051
Programming Tools and Techniques

Software tools
Programming 8051 using Keil C
Writing program using the Keil IDE

Hardware Tools
Trainer Kit: Highly New Advanced ISP kit developed by TICO

Faculty Members
All faculties' members are from TICO R&D lab. They are enriched in their industrial experience.

Module 2
Learning Modules (hands on Practical)
Theoretical aspect of each module
Practical implementation
Interfacing of Input Devices
Linear Keys
What is the type of switches?
Their types & function

Matrix Keypads
How they work
How to interface with microcontroller
Opto Couplers
What are optocoupler?
Interfacing Opto-Isolators

Interfacing of Output Devices
Led
Different types of led.
How it works
How LEDS will rotate
How to connect with microcontroller
What is sourcing & sinking?
Seven Segment Display
What are the types of display?
Difference between Common Anode and Cathode
Driving circuits
Relays
What are the different types of Relay?
How it connect with microcontroller.
Piezo buzzer (Alarm unit)
How does a buzzer sound?
Stepper motor
How a stepper motor works
How to drive stepper motor
DC Motor
How a dc motor works
Motor drivers IC
On Chip Timer
What is a timer?
How does a 51timer works?
How to make accurate delay using timer
Timer Interrupts
How to write code for timer?
On Chip Counter
Counter Interrupts
How does it work?
What are the different modes of counter?
How to write code?
External Interrupt
What is an interrupt?
How does it work?
How to write code?

Module 3
Introduction to Robotics
Industry Scenario
Robotic Arm
Different types of motors
DC Motor

Servo Motor
Stepper Motor
Characteristics and comparison of motors
Different types of Drives
H Bridge Driving
Stepper Driving circuits
Legged Robots
6 legged robots
4 legged robots
2 legged robots

Module 4
Different types of Sensors
LDR sensors
Photo resistor
Infrared Emitter/Detector
IR sensors
Tactile Bumper Switch
Encoder (Slot, Rotary, Linear)
Sharp IR Rangefinder

Project Work:
ROBOTICS PROGRAMMING
Module 4
Creating a line following robot from scratch
Mechanical Construction of Robot
Interfacing with DC geared motor
Controlling Speed and direction of the motor
Calibrating the IR sensor
Testing for various cases
Simple obstacle avoiding Robot

SMART BENEFITS:-
Multi time boost in Confidence level and understanding of ROBOTICS world
A certificate will be awarded to each student. This will be recognized as a
Industrial training certificate in engineering colleges.
You will be able to do your minor and major projects of academic value on your own
Professional Industrial environment for project work.
This will be a gateway for Embedded Technology
A fast emerging technology for Electronics professionals.

An Investment in Knowledge Pays Best Returns. Benjamin Franklin
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