

Wave Techtronics

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Embedded Systems

(15-days training)

Project based Embedded Course Content

- Introduction to Electronics
- Why Robotics?
- Applications of Embedded system in electronic appliances
- What is robotics and how embedded system makes a robot work?
- Future scope of Embedded system
- Needs of Basic Modules

Introduction of Electronic Components

- History of Electronics and Electronic Component
- Various Electronic Components
- Application of Electronic Component
- How to test before using Electronic Components
- Introduction to:
 1. Resistor
 2. Capacitor
 3. Inductor
 4. Transistor
 5. Integrated circuits (ICs)
 6. Relays etc

Logical Devices

- What are logic gates?
- What is a Logical Device?
- Transistor
- Microprocessor
- Microcontroller
- Difference b/w Microprocessors/ Microcontroller.
- Application of various Microcontrollers

Study of various electronic devices:

- LED
- Push Buttons
- Seven segment display
- Relay
- Crystal Oscillator
- Transistors
- Geared motors
- DPDT switches
- Buzzer

Basic Interfacing components

- LEDs
- Switches
- Buzzer
- Motors
- Relay
- Sensor

Soldering Requirements

- Solder 25-30 watts
- Soldering Wire
- Soldering Flux
- PCB- Zero size PCB

Structure of Robotics

- Sensors/ Switches (Input Devices)
- LED/ LCD/Buzzers/Actuators (Output Devices)

Introduction to Sensors

- What are Sensors?
- How to select a sensor?
- Working of sensors
- How to design our own sensor?
- Converting analog sensor to digital sensor
- Use of LM-358 IC
- Different Sensors:

1. Analog Sensors
 2. Digital Sensors
- Infrared Sensor Sensors
 - LDR Sensors
 - Sound Sensors
 - Application of Sensor
 - How to Interface Sensor

Interfacing to Motors

- AC Motor
- DC Geared Motor
- Stepper Motor
- Servo Motor

Introduction to L293D

- What is L293D
- Pin description of L293D
- What is H-Bridge
- Architecture of H-Bridge

Starting with simulations and hardware

Experiments with LEDs:

- LED On
- LED Blinking
- LEDs Running Pattern
- LEDs one by one filling pattern
- LED array

Experiments with Buzzers:

- What are buzzers?
- Types of buzzers
- Working of a buzzer
- Interfacing of buzzer

Experiments with Motors

- What are motors?
- Types of motors
- Introduction to:
 1. AC Motor
 2. Stepper motor
 3. Servo motor
 4. DC Motor
- Interfacing of DC motors

Software Used

- Arduino IDE, Proteus.

Projects covered

1. Blinking LEDs
2. Interfacing Buzzer
3. Interfacing Relay
4. Interfacing LDR
5. Interfacing IR sensor
6. Interfacing Switches
7. Automatic Day Night Light Project
8. Motion based Light
9. Motion based burglar alarm
10. Line Follower using two IR-Sensors
11. Sensor Controlled 220V bulb switch
12. Intelligent street light
13. Photophobic Robot
14. Controlling dc Motor speed
15. Interfacing Servos
16. Generating PWM signals to control Servo motors

Training Kit Details

- Power supply:
 - 4X diode(IN4007)
 - 2XCapacitor
 - 7805
 - LED indicator
 - Resistors-1K

○ On/Off switch	
• PCB Board-----	1
• Data LED-----	5
• Resistors-----	5
• Chassis Board--	1
• Relay 5V-----	1
• Connecting Wires-----	1
• LDR sensor-----	1
• Screwdriver-----	1
• Ball Caster wheel-----	1
• IR Based Digital Sensors-----	2
• Push Buttons-----	4
• BC-547(NPN) transistor-----	5
• Wheels BO-----	2
• D.C BO motors-----	2
• Buzzer-----	1
• L293D(Motor Driver IC)-----	1
• Male/ Female headers-----	2
• Battery(9V)-----	1
• Battery Connector-----	1
• Soldering wire-----	1
• Screw Pack-----	1
• Transformer-----	1