

Embedded Systems Primer-From basic to advanced

Microcontroller: Atmega and PIC

Software used: AvrStdio4, MPLAB

Sensor: Digital IR sensor, Accelerometer, Lpg sensor, Temperature sensor

Display devices: LCD, Seven segment, Led Dot matrix

Project: Line Flower, Edge avoider, Obstacle avoider, Gesture control Robot, Wireless Robot, Android Control Robot, Electronic Voting machine, Temperature control fan, Moving display on Led Panel etc

- Introduction to the world of Robotics
- Understanding the training module
- What, Why, How of Robotics?
- Other General Topics Introduction to Embedded Systems and Robotics
- AVR Micro Controllers
- Atmega 8/16/32
- Understanding the Training Kit
- Installation of Softwares
- Knowledge of Embedded C
- How to Write Codes, Burn the Codes in Micro -Controller
- Basics of Electronics Used in Circuits
- Hands On 1- LED Patterns
- Hands On 2 – Seven Segment Display
- Hands On 3 – LED Matrix Display
- How to interface a LCD with uC.
- Understanding Pins of LCD
- Hands-On 4 – Display your name on LCD
- Hands On 5 – Shifting Text on LCD
- How to interface Other I/O Devices
- Hands On 6 – Using a Switch
- Hands On 7 – Using a Buzzer to listen a Audio Output

- Introduction to timer
- Introduction to interrupts
- Interfacing of Sensors with uC
- Understanding how a particular Sensor is interfaced with a uC
- Hands On 8 – Interfacing a Sensor with uC
- Hands On 9 – Control LEDs using Sensor
- Hands On 10 – Display different patterns on LCD using Sensor
- Motor Control
- Hands On 11 – Control of Motors
- Hands On 12 – Line Following Robot
- Hands On 13 – Obstacle Avoider Robot
- Hands On 14 – Edge Avoider Robot
- Introduction to ADC
- What is ADC, How and Where it is used
- Understanding the Values of ADC
- Hands On 16 – Reading ADC Values of Sensors and Display on LCD
- UART
- What is UART
- How and where it is used
- Interface between Computer and uC
- Hands On 17 – Connecting uC Board to your Computer
- Hands On 18 – Control LED Pattern using Keyboard
- Hands On 19 – Display Text on LCD using Keyboard
- Serial Terminal
- Hands On 20 – Display Sensor Values on Serial Terminal
- Hands On 21 – Display Your Names on Computer Screen using Sensors.
- Hands On 22 – Computer Controlled Robot
- What is DTMF?
- Hands On 23- Mobile Controlled Robot

- Accelerometers
- What is it? How it is Used
- Hands On 24 – Display Accelerometer Parameters on LCD and Serial Terminal
- Hands On 25 – Gesture Controlled Robot using Accelerometer
- SPI protocol
- I2C protocol

Second Controller PIC

- Overview of PIC Microcontrollers
- LCD, LED and 7 Segment Interfacing
- Analog to digital conversion
- Interrupts
- UART Implementation
- I2C Protocols
- Encoders/Decoders