

## **Arduino Course Content (45 Days)**

### **1. Introduction to Embedded Systems**

- Anatomy of Embedded Systems
- Introduction to Open Source platform
- Introduction of Electronic Components
- Introduction to Sensors
- Introduction to Computational Devices

### **2. Introduction of Electronic Components**

- What is Electronic Component?
- History of Electronic Component
- Various Electronic Component
- How to use Electronic Component

### **3. Introduction to Sensors**

- Components
- Application of What is Sensor?
- Various Basic Industrial Sensors-IR- Analog Sensor
- IR Digital Sensor
- Color IR\_TSOP Sensor
- Light Sensor
- Sound Sensor
- DTMF Module
- Selection of Sensor
- Basic working Technique of Sensor
- Application of Sensor
- How to Interface Sensor
- How to Design Analog/Digital Sensors

### **4. Introduction to Computational Devices**

- What is Computational Device?
- Transistor
- Logic Gates
- Microprocessor
- Microcontroller
- Difference B/W Various Computational Devices

- Application of various Computational Devices
- Selection of Computational Device
- How to use Various Computation Device/

## **6. Interfacing to Actuator**

- What is Actuator?

## **7. How to work on Educational & Engineering Level Actuator**

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

## **8. Introduction to Driving System/Locomotion**

- What is Driving System?
- Various Types of Driving System
- Why need Driving System

## **9. How to Drive Motor**

- H-Bridge Motor Drive
- Advanced Motor Driver

## **10. Introduction to Programming Languages**

- Various programming Languages
- Selection of programming Language
- Need of Flow Diagram
- How to write First "LEDBLINKING" Code in Embedded C
- Why always First "LEDBLINKING" Code ?Practice on various LED Pattern
- Debugging of Error Program

## **11.Introduction to Analog to Digital Convertor(ADC)**

- ADC, How it works???
- Different Mode and Registers of ADC
- Programming ADC

## **12.Introduction to Timer/counter**

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- TIMER, How it works???
- Different Mode and Registers of TIMER
- Programming TIMER

## **LIVE Projects Covered**

- LED Blinking
- LED Blinking
- Running LEDs
- Sand Glass Filling of LEDs
- Decoration LEDs/LED Patterns Etc.
- De-bouncing
- Buzzer Testing
- Sensor Interfacing
- DC Motor Driving
- DC Motor Driving using 4Bit Keypad
- Black Line Follower using two IR-Sensor
- White Line Follower using two IR-Sensor
- Stepper Motor Driving(DEMO)
- Wall follower Robot

- Edge Avoider Robot
- Intelligent Line Follower Robot
- Cell Phone Controlled Robot(DEMO)
- Seven Segment Display
- Seven Segment Multiplexing
- BlinkingLEDsusingTIMER0
- Blinking LEDs using Interrupts
- PC to  $\hat{\mu}$  C Communication
- $\mu$  C to PC Communication
- PC- $\hat{\mu}$  C Full Duplex Communication
- Computer Keyboard Robot(DEMO)
- Digital Voltage Measurement
- Counting of Numbers using 4bit Keypad
- Digital Voltage Measurement
- Counting of Numbers using 4bit Keypad
- Digital Visitor Counter
- Temperature Controlled Fan(DEMO)
- Digital Thermometer(DEMO)
- Home Security System
- Home Automation System(DEMO)

## **Arduino Training Kit Details (45 Days)**

- Arduino Uno Board
- 4 bit Keypad
- 4 bit LED
- Analog Voltage Sensor
- Segment Display
- Digital Buzzer Module
- M to F Wire 11