

# SUMMER TRAINING PROGRAM 2013

(AVR & ARM)

**Introduced By:**



**In Association with:**



YD Tech Sourcing Pvt. Ltd.

**Contact Us:**

**Matbotrix Technologies (Regd.)**

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## Summer Training Program 2013

- ❖ **Course Name:** AVR & ARM Microcontroller
- ❖ **Course Duration:** 45 Days, 80/90 hrs
- ❖ **Course Fee:** INR 8900 (Including Taxes)
- ❖ **Course Certification:** Certified by Matbotrix Technologies (Regd.) & YD Tech Sourcing Pvt. Ltd.
- ❖ **Course Level:** Advanced Level
- ❖ **Robotics Toolkit:** Free to Each Participant
- ❖ **Study Material:** Books & CDs free to each participant
- ❖ **Group discount:** Up to 15%
- ❖ **Website:** <http://www.matbotrix.com>

### **Course content:**

- 1. Introduction to Electronics**
- 2. Basic of Embedded C language**
  - Difference between C and Embedded C
  - Conditional statements
  - Looping
  - Array
  - Structures
  - Pointers
- 3. Introduction to AVR ATmega8/16/32 and ARM7 Basic Features**
  - AVR Architecture
  - PINOUT of ATmega8/16/32
  - I/O Registers
- 4. Programming ATmega8/16/32**
  - Compilers
  - Project setup
  - Burning ATmega8/16/32
- 5. Interfacing LCD with AVR ATmega8/16**
- 6. Advanced Features working and Hands on.**

- Timers/Counter
- Overflow Mode
- Input Capture Modes
- Wave generation Mode
- Intro to Timer Registers
- Programming AT mega Timers/Counters
- Development of Digital Clock

## **7. ADC**

- Introduction to ADC
- ADC Modes (Free Running and Single Conversion Mode)
- ADC Registers
- Programming ADC
- Displaying Temperature using Temperature sensor

## **8. PWM**

- Introduction to PWM
- Wave generation Modes of Timers/Counter
- PWM generation strategy
- Displaying PWM on LED

## **9. AVR Boot Loader**

- Working with Boot Load section
- Lock Bits
- Programming Boot Loader

## **10. EEPROM**

- Intro to EEPROM
- EEPROM Registers
- Programming (Reading/Writing) EEPROM

## **11. USART**

- Introduction to USART
- Synchronous and Asynchronous serial Communication
- Difference between SPI,I2C and UART
- USART Registers
- Programming USART
- Rx/Tx Pair Wireless Communication

## **12. Sensors and Advance Modules**

- Accelerometers

- Types of Accelerometers
- Programming for MMA7260 Triple axis accelerometers

### **13. ZigBee (XBee)**

- Introduction to ZigBee
- Settings for ZigBee(series 2)
- ZigBee Pinout
- Zigbee AT Commands

### **14.4 Bit encoder/decoder circuits**

### **15. GPS Module**

### **16. GPS System**

- NMEA Command Set
- Programming for latitude and longitude Reading
- Compass

### **17. Introduction to ARM7 LPC2148**

- Introduction to ARM based Embedded systems
- ARM processor fund
- Registers, Processor modes
- ARM7TDMI Architecture
- ARM7TDMI block diagram
- GPIO, timers, UART programming in Embedded C

### **Projects Covered:**

1. Swarm Communication b/w 2 Robots
2. Intelligent line follower
3. Wireless Robots
4. Gyro Sensor Based Robots
5. Cell phone Controlled Robots
6. GPS based Robots
7. LCD based Game
8. RF ID based attendance systems
9. 4 leg Walking Robot
10. RC servo Control
11. Digital Clock
12. PWM based Speed Control
13. Stepper Motor Control

14. USART/UART Communication
15. Digital Compass Based Navigation
16. Touch Screen Interfacing
17. Bluetooth Communication with Robots
18. Intelligent Line Following Robot
19. Color Line Follower
20. Hexapod (Spider Robot)
21. Two Wheel Self Balancing Robots

## **Industry Interface Program**

### **Projects**

- 3 Assignments / Mini Projects
- 1 Major Project

### **Domains / Industry**

- Manufacturing
- Architecture
- Civil
- Electricals and Electronics

