

**Workshops AVR 2015: Robot with intelligence (Training)** is an innovative program that exposes talented students to research. It is an attempt to provide the enthusiasts a complete platform in the field of **Robotics and Embedded**. In this 16 hour program students learn and develop their own robot which can take their own decisions .It includes introduction and explanation of AVR platform and sensors.

**Key features of Workshops 2015:**

- In-depth Knowledge of Sensors) and AVR microcontroller and their use in home automation and robotics
- Training Certificate will be provided as par to Industries.
- Training delivered by Design Engineers (R&D team) of Spaad EduTech.
- Course details available online.

SPAAD EduTech has developed this advanced course in AVR for the students who are interested to explore more features in single microcontroller. AVR is the mostly used microcontroller by industries after PIC.

- **Recommendation:** Beneficial for students having knowledge of some basic microcontrollers, interested in advanced Microcontroller based projects.
- **Prerequisite:** knowledge of basic “C” language

Basic electronics

- static electricity
- voltage
- current
- resistance
- earthing
- branches n nodes
- KVL,KCL
- capacitor
- voltage regulators
- transistors

### Digital electronics

- microcontroller
- difference between microprocessor and microcontroller
- significance of sensors
- LDR
- IR sensors
- potentiometer n switches
- ultrasonic sensor
- temperature sensor
- accelerometer n gyroscope
- GPS
- TRIAC
- LCD
- LED

### Introduction to embedded C

- difference between C and embedded C
- Data types
- significance of range
- identifier
- arithmetic operator
- logical operator
- shift operator
- How to make your program
- if else statement
- loop statement
- switch statement
- function
- pointer
- difference between pointer and double pointer
- break, continue and GOTO statement

### Introduction to microcontroller

- Introduction to AVR family
- Introduction to controller atmega8
- How to choose your controller
- Comparison between 8051, AVR, PIC ,Renesas n ARM

### Software

- Introduction to software(HID Boot Flash)
- installation of software
- settings necessary to be done

### LED (Explanation & programming)

- Interfacing of LEDs
- principal and logic of how the LED glow
- internal structure of LED
- glowing LEDs in different pattern

### Switches (Explanation & programming)

- Interfacing of Switches
- principal and logic of how the Switches work
- different types of Switches
- using Switches to do some task(for ex- glowing respective LED)

### LCD (Explanation & programming)

- Interfacing of LCDs
- principal and logic of how the LCD work
- internal structure of LCD
- Displaying your name on LCD
- scrolling your display on LCD

## Motors

- Types of Motors(DC, stepper)
- Interfacing of Motors
- principal and logic of how the Motors work
- internal structure of Motors
- rotating Motors in different directions

## ADC

- What is ADC
- How to configure the ADC
- principal and logic of how the ADC work
- registers and bits associated with ADC
- display ADC(sensor) response on LCD

## Introduction to sensors

- Interfacing to various sensors
- Various designs possible with these sensors
- Line follower
- Obstacle detector

## Project list

- Blink LEDs
- Blink LEDs in a pattern
- Controlling LEDs with switches
- Controlling LEDs pattern with switches
- Display Name on LCD
- Display ADC data on LCD
- Make your own line follower + obstacle avoider.