



**Workshops PIC 2015: DTMF based Robot (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 PIC platform and DTMF Module.

### Key features of Workshops 2015:

- In-depth Knowledge of DTMF tones and PIC 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 PIC for the students who are interested to explore more features in single microcontroller. PIC is the mostly used microcontroller by industries.

- **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 PIC family
- Introduction to controller PIC 16F877A
- How to choose your controller
- Comparison between 8051, AVR, PIC ,Renesas n ARM

## Software

- Introduction to software(MPLAB)
- 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



## **SPAAD EduTech**

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### 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

### DTMF (Explanation & programming)

- Interfacing of DTMF
- principal and logic of how DTMF works
- values of DTMF on LCD

### Project list

- Blink LEDs
- Blink LEDs in a pattern
- Controlling LEDs with switches
- Controlling LEDs pattern with switches
- Display Name on LCD
- Rotating motors in clockwise and anticlockwise direction.
- Interfacing DTMF and showing its values on LCD.
- Controlling robot using DTMF