

## PROJECT BASED TRAINING IN EMBEDDED SYSTEM DESIGN ON 8 BIT PIC 16 FXX / 18 FXX FROM MICROCHIP TECHNOLOGY INC, USA

### QUALITIES OF INSTITUTE:

1. Awarded Best Institute in Embedded (2010-11) & (2009-10)
2. ISO 9001:2008 Certified
3. Trained more than 3000 students since 2002
4. Individual PC & training kit for each student for better learning
5. Individual attention to each student
6. Well tested and proven training methodology
7. Fully furnished lab and separate theory class rooms

### TRAINING METHODOLOGY

Theory Practical **ratio 30% : 70%**  
Main focus is given on fundamental understanding

### FACULTY MEMBERS

All faculties' members are from TICO R&D lab. They are enriched in their industrial experience.

### HARDWARE TOOLS

Trainer Kit: Highly New Advanced PIC kit developed by TICO

### COURSE MATERIAL

Each student will be given a copy, Microcontroller reference manual, lab manual, A TICO CD containing valuable resources.

### COURSE DETAILS

#### Introduction to Embedded Systems

Components of Embedded Systems  
Microchip Overview, Market Profile, Product range  
Key advantage and support network of microchip

#### Introduction to Microcontrollers

Overview of basic electronics, digital electronics  
History of microcontroller development  
Microcontroller vs. Microprocessor  
Common features of microcontroller  
Different types of microcontrollers

#### Microcontrollers 16 FXX / 18 FXX

Microcontroller chips  
Programmable logic device  
Harvard architecture Vs Von Neumann

#### The microchip PIC micro MCU Processor Architecture

Pin Diagram and Port Architecture  
Device and feature summary  
Program Memory  
Data/ Ram memory  
Status Register, Working register, Ports(input or outputs),  
Option register  
Configuration register, Reset vector, Interrupt vector, Stack,  
Program counter

The CPU, Data movement, The PC and the stack, The PIC micro MCU Inst. set  
Addressing modes, MPLAB IDE  
PIC micro MCU compatible devices

#### Programming the PIC micro

Introduction to Programming Languages  
CCS PIC C Compiler, CCS Overview, PCW IDE, PCW Compiler, Built In Functions  
Advanced Programming with CCS PIC C compiler Software

#### List of Practical Learning Modules Driving LED's

Making different pattern with LED's  
Rotation of LED (Left & Right)  
Conversion Diversion Pattern  
Making sand glass, Binary counter

#### Interfacing linear Keypad

Driving of LED's with keys  
On/Off switch operation  
Keys as Toggle Switch

#### Interfacing matrix Keypad

Driving of LED's with keys  
On/Off switch operation

### Common Anode Display

Fixed display of digits  
Driving the display of digits by linear keypad

### Interfacing 8 bit LCD (16x2)

Fixed one line static message display  
Running message display, Numeric Value display,  
Password code lock

### Interfacing Opto-Isolators

Getting control logic at a different voltage level  
To know the concept of isolation between control and  
power circuit of project.

### Driving Relays

Relay driving using integrated circuits  
Conditional switching of Relays

### Piezo buzzer (Alarm unit)

How does a buzzer sound?

### Interfacing stepper motor

How a stepper motor works  
How to drive stepper motor  
Clockwise/Anticlockwise Rotation  
Controlling the Speed of Motor

### DC Motor

How a dc motor works  
Motor drivers IC

### On chip Peripherals

#### ADC (Analog to digital converter)

To access the on chip ADC & see its effect by varying signals.

#### On Chip Timers

How to start and write code for using timers

#### External Interrupt

What is an interrupt? How does it work? How to write  
code?

### I2C Memory Interfacing

To write & read data on the EEPROM residing off chip.

### PROJECT WORKS

After successful completion of training, you must make  
projects (**Only One**)

#### Robotics:

Line Follower Robot  
Anti collision Robot  
DTMF Based Remote mobile Robot  
RF Based Robot  
Voice controlled robot

#### Home Automation:

Electrical energy Saver  
Real Time Clock based automatic Device Control  
Home security system  
Centralized controlling home Through PC

#### Industrial Automation:

Data logger & Process monitoring  
Temperature indicator and controller  
Lift Control Model with Stepper motor  
Frequency monitoring & Set point switching  
Speed control of AC motor using triac

#### Bio Medical Instrumentation

Multi channel monitoring system for Biomedical CO2,  
Heart Beat, Temp, Light

#### Telecom

Master Slave communication through Serial port  
DTMF based remote home appliances control

#### Office security/Automation

Smart Card Access Control System with RFID cards (125  
khz)  
Time Attendance Monitoring system  
Bank Token Display  
RGB Color Pattern generator

## 5 - SMART BENEFITS:-

- 1. Multi time boost in Confidence level and understanding of Embedded world.**
- 2. Certification:** A certificate will be awarded to each student. This will be recognized as a Industrial training certificate in engineering colleges.
- 3. Project :** You will be able to do your minor and major projects of academic value on your own
- 4. Gateway:** This will be a gateway for Embedded Technology
- 5. Improve JOB chances:** A fast emerging technology for Electronics professionals.

*An Investment in Knowledge Pays Best Returns. Benjamin Franklin*

#### Corporate Office:

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Duration:
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