

PROJECT BASED TRAINING IN PIC MICRO

Duration: _____

Timing: _____

Start date: _____

Fee: _____

COURSE DETAILS

1. Introduction to Embedded Systems

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

2. Introduction to Microcontrollers

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

3. Microcontrollers 16F877A / 18F4520

Microcontroller chips
Programmable logic device
Deciding which device to use in application RISC computing
Harvard architecture Vs Von Neumann

4. 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

5. PIC micro MCU Hardware features

Interrupts

Timers

Power input and decoupling

Reset

Watchdog timer

System clock/oscillators

Configuration registers

Special functions (A/D, T/C)

6. Programming the PIC micro

Introduction to Programming Languages

Machine language

Assembly language

High level language

Why C language?

Subroutines

Stack operation

Timing loops

Tuning timing loops

Programming Tools and Techniques

Software tools

CCS PIC C Compiler:

CCS Overview

PCW IDE

PCW Compiler

Built In Functions

Advanced Programming with CCS PIC C compiler Software

Hardware Tools

Trainer Kit: Highly New Advanced PIC kit developed by TICO

Faculty Members

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

Course material

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

Training Methodology

Theory Practical ratio 30 % : 70%

Main focus is given on fundamental understanding

List of Practical Learning Modules

7. Interfacing of Output Devices

Driving LED's

Making different pattern with LED's

Rotation of LED (Left & Right)

Conversion Diversion Pattern

Making sand glass

Binary counter

Driving Relays

Relay driving using integrated circuits

Conditional switching of Relays

Piezo buzzer (Alarm unit)

How does a buzzer sound?

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

Password code lock

Interfacing stepper motor

Clockwise/Anticlockwise Rotation

Controlling the Speed of Motor

DC Motor

How a dc motor works

Motor drivers IC

Stepper motor

How a stepper motor works

How to drive stepper motor

8. Interfacing of Input Deices

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

Interfacing Opto-Isolators

Getting control logic at a different voltage level

To know the concept of isolation between control and power circuit of project.

9. On chip Peripherals

ADC (Analog to digital conerter)

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.

10. PROJECT WORKS:

After successful completion of training, you can make following types of minor/
Major industrial projects (Only One) Project expense will be given by trainee.

Robotics:

Line Follower
Light Follower
Anti collision robot

Home Automation:

Electrical energy Saver
Home security system
Smart kitchen

Industrial Automation:

Data logger
Temperature indicator
Temperature controller
Multi channel monitoring system

Telecom

DTMF based remote home appliances control
RF based controlling

Office security/Automation

Smart Card Access Control System with RFID cards (125khz)
Time Attendance Monitoring system
Electronic voting machine

SMART BENEFITS:-

Multi time boost in Confidence level and understanding of Embedded world

A certificate will be awarded to each student. This will be recognized as a industrial training certificate in engineering colleges.

You will be able to do your minor and major projects of academic value on your own professional Industrial environment for project work.

This will be a gateway for Embedded Technology. A fast emerging technology for Electronics professionals.

An Investment in Knowledge Pays Best Returns. Benjamin Franklin

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