PROFESSIONAL COURSE IN PIC 16F SERIES

COURSE DETAILS

1. Introduction to Embedded Systems
Introduction
Components of Embedded Systems
2. Introduction to Microcontrollers
Brief overview of digital electronics
History of microcontroller development
Microcontroller vs. Microprocessor
Common features of microcontroller
Different types of microcontrollers
3. Microcontrollers
Microcontroller chips
Programmable logic deice
Deciding which deice to use in application
RISC computing
Harvard architecture
4. The microchip PIC micro MCU
Hardware Details
Pin Diagram and Port Architecture
Device and feature summary
MPLAB IDE
MPASM
PIC micro MCU compatible deices
5. The microchip PIC micro MCU Processor Architecture
The CPU
The PIC micro MCU's ALU
Data movement
The PC and the stack
Reset
Interrupts
Architecture differences
The PIC micro MCU Inst. set
The mid range instruction set
Other PIC micros instruction sets
6. PIC micro MCU Hardware features
Interrupts
Timers
Power input and decoupling
Reset
Watchdog timer
System clock/oscillators
Configuration registers
Special functions (A/D, PWM)
7. Programming the PIC micro

Introduction to Programming Languages
Machine language
Assembly language
High level language
Why assembly language?
Programming Tools and Techniques
Understanding assembly language syntax
Designing the program
Flow charts
Addressing Modes
Direct addressing
Indirect addressing
Program Flow
Conditional branching
Direct jumps
Direct calls
Return from subroutines
LIST OF LEARNING MODULES
8. 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 drying using integrated circuits
Conditional switching of Relays
Common Anode Display
Fixed display of digits
0-9999 timer
Driving the display of digits by linear keypad
Interfacing 8 bit LCD (16x2)
Fixed one line static message display
Running message display
Interfacing stepper motor
Clockwise/Anticlockwise Rotation
Controlling the Speed of Motor
9. Interfacing of Input Deices
Interfacing Opto-Isolators
Getting control logic at a different voltage level
To know the concept of isolation between control and power circuit of project.
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
10. On chip Peripherals
ADC(Analog to digital conerter)
To access the on chip ADC & see its effect by varying signals.
EEPROM Interfacing
To write & read data on the EEPROM residing in the chip.
PROJECT WORKS:
All the training modules programming and interfacing will be done on following embedded
Tools:
Software tools:
Assembler: MPLAB (Editor, Assembler, Simulator)
Hardware tools:
Programmer: PIC Starter Plus
Exposure to In-circuit Debugger (A fast debugging embedded tool)
An Investment in Knowledge Pays Best Returns. Benjamin Franklin

Corporate Office:
TICO INSTITUTE OF EMBEDDED TECHNOLOGY
B-1/628 3rd floor
Metro Pillar No.570
Main Najafgarh Road
Janakpuri, New Delhi-110 058
Ph. No. - 011-25571050, 9899795696.
Email - info@tico-india.com
Web: www.tico-india.com