PROFESSIONAL COURSE IN 8051

COURSE DETAILS

1. Introduction to Microcontroller

v Brief overview of digital electronic
v History of microcontroller development
v Microcontroller vs. microprocessor
v Different types of microcontrollers

2. The 8051 Architecture

Ø Hardware Details

v Pin diagram
v Port details

Ø Port Organization

v I/O Ports
v Port structure and operation
v I/O Configuration
v Port loading & interfacing

Ø Memory Organization

v code memory
v Internal RAM
v External RAM
v Bit memory

Ø 8051 Registers

v Basic registers
v Registers
v Special function registers {SFR}
v The accumulator
v B Register
v Data pointer register
v Program counter
v Stack pointer

Ø On Chip Peripherals

v Timers/Counters
v UART

Ø 8051 Interrupts

v Reset
v External Interrupts
v Interrupt destinations
v Software generated Interrupts
v Interrupt enable register
v Interrupt control & priority
v Timer flag Interrupt
v Serial port interrupt

3. PROGRAMMING THE 8051

Ø INTRODUCTION TO PROGRAMMING LANGUAGES
v Machine Language
v Assembly Language
v High Level Language
v Why Assembly Language
v C++ Programming
Ø Programming Tools and Techniques
v Understanding Assembly Languages Syntax
v Designing the program
v Flow charts
v Introduction to editors, assembler and simulator
Ø Addressing Modes
v Immediate addressing
v Register addressing
v Direct addressing
v Indirect addressing
4. INTRODUCTION TO INSTRUCTION SET
v Arithmetic instructions
v Logical instructions
v Data transfer instructions
v Jump and call instruction
v Interrupt and interrupt handling routines
Ø Program flow
v conditional branching
v Direct jump
v Direct calls
v Return from subroutine
Ø Timers
v How timers count
v Measuring time
v How long do timers take to count
Ø Timers SFRs
v PCON
v TCON
v TMOD
v Mode 0-13 bit timer
v Mode 0-16bit timer
v Mode 2-auto reload timer
v Mode 3-split timer
v Initializing a timer
v Reading a timer value
v Detecting a timer overflow
v Timing the length of an event
v Timers as event counters
Ø Serial port operation
v setting the serial port mode

v setting baud rate
v writing to the serial port
v reading from the serial port

5. Interfacing with real world devices

Ø DRIVING LEDs
v Making different pattern with LED's
v Rotation of LED(left & right)
v Making sand glass
v Binary counter

Ø DRIVING RELAY
v Relay driving using integrated circuits

Ø INTERFACING OPTO-ISOLATORS
v Getting control logic at a different voltage level

Ø INTERFACING OF KEYS
v **Interfacing linear keypad**
v Driving LED's with keys
v On/Off switch operation

Ø INTERFACING MATRIX KEYBOARD
v On/Off switch operation
v Integrating all LED's modules in one & controlling them with keys

DRIVING SEVEN SEGMENT DISPLAY

Ø **Common Cathode Display**
v Fixed display
v Driving the display of digits by linear keypad

Ø **Common Anode Display**
v Fixed display of digits
v Entering parameters & driving display with matrix keypad

ØINTERFACING THE ADC (analog to digital converter)
v conversion of analog signal into digital signal using ADC and see its effect by varying signal

ØINTERFACING THE DAC (digital to analog converter)
v Conversion of digital signal into analog signal using DAC

ØINTERFACING 8 BIT LCD (16X2)
v Fixed one line static data communication between two microcontrollers

ØSERIAL COMMUNICATION (RS-232 standard)
v Establishing serial data communication between two microcontroller

ØEEPROM INTERFACING
v To write data and read the same from the EEPROM(24C01)

ØTIMER
v Using interrupts, synchronized with delay of one seconds

ØCOUNTER
v To count the occurrences of a particular event

ØSTEPPER MOTOR
v Driving stepper motor

6 REAL TIME PROJECT WORKS

v Temperature indicator
v To measure the temperature & display it on the seven segment

Ø FREQUENCY COUNTER

v To count the frequency of an event & display it on LCD/ 7SEG
v Only outperforming students in programming can avail this benefit

7. EMBEDDED C PROGRAMMING

v Embedded C -Embedded cross compilers
v Memory models
v Data Types
v Structures
v Unions and Arrays
v Important of pointers in Embedded C
v Programming with Cross compiler tool

Ø **Embedded Programming in Keil Software:**

v Features of Keil Software and Embedded Software development
v Advanced Programming with Keil Software
v LCD interfacing on c compiler

With all this to offer, this is an opportunity of lifetime for you, so what are you waiting for, come and be the part of 90 Billion Dollars Embedded Industry

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