Embedded System 6-Months

8051 MICROCONTROLLERS USING ASSEMBLY AND C

INTRODUCTION TO EMBEDDED SYSTEM

• History & need of Embedded System
• Basic components of Embedded System
• Hardware Classification of Embedded System
• Programming Language Classification of Embedded System
• Advantage & Disadvantage of Low level & High level programming language of Embedded System

MICROPROCESSOR & MICROCONTROLLER CLASSIFICATION

• Difference between Microprocessor & Microcontroller
• Classification based on architecture
• Classification based on Instruction Set
• Type of Microcontroller
• Memory Classification

INTRODUCTION TO 8051 MICROCONTROLLER

• Introduction of ATMEL 8051 family
• Block diagram description of AT89C51
• Special feature of AT89c51
• Pin description of AT89c51

REGISTERS & MEMORY OF AT89C51

• Description of RAM
• Description of CPU Registers
• Function of SFR

ASSEMBLY LANGUAGE PROGRAMMING OF AT89C51

• Addressing Modes of AT89c51
• Directives of Assembly Language
• Data Transfer Instruction
• Jump Instruction
• Arithmetic Instruction
• Logical Instruction
• Branching Instruction

INTERFACING OF LED

• Introduction of LED’s
• Interfacing Circuit Description of LED’s
• Programming of LED’s Interfacing

INTERFACING OF SEVEN SEGMENT DISPLAY

• Introduction to 7 Segment Display
• Types of 7 Segment Display
• Interfacing Circuit Description of 7 Segment Display
• Programming of 7 Segment Display Interfacing

INTERFACING OF LCD

• Introduction to 16 x 2 LCD
• Commands of 16 x 2 LCD
• Interfacing Circuit Description of 16 x 2 LCD
• Programming of 16 x 2 LCD

INTERFACING OF SWITCHES & KEYBOARD MATRIX

• Introduction to Switches & Keyboard Matrix
• Interfacing Circuit of Switches & Keyboard Matrix
• Programming of Keyboard Matrix & Switches
• Controlling of LED’s By using Switches
• Keyboard Matrix & LCD Interfacing Program

INTERFACING OF MOTORS

• Introduction to Motors
• Types of Motors used in Embedded System
• Programming & Controlling of Motors in Embedded System

TIMERS & COUNTER PROGRAMMING

• Introduction to Timer & Counter
• Difference between Timer and Counter
• Description of SFR associated with Timer & Counter
• Programming of Timer & Counter

SERIAL COMMUNICATION PROGRAMMING

• Introduction to Serial Communication
• Types of Serial Communication
• Description of SFR associated with Serial Communication
• Introduction & Interfacing of UART
• Programming of UART

INTERRUPT DRIVEN PROGRAMMING
Introduction to Interrupts
Types of Interrupts
Programming of Software & Hardware Interrupts

INTERFACING OF ADC

Introduction to ADC
Interfacing circuit of ADC
Working & Interfacing of Temperature Sensor (DS1621 & LM35)

INTERFACING OF EXTERNAL MEMORY

Introduction to External Memory Interfacing
Introduction to I2C Protocol
Using I2C library to read/write External Memory

INTRODUCTION OF EMBEDDED C

Introduction to Embedded C
Different between C & Embedded C
Data type of Embedded C
Operators of Embedded C
Statements & loops of Embedded C

INTERWORKING OF ASSEMBLY & EMBEDDED C

Inline Function
Inline Assembly Routines

PROGRAMMING & INTERFACING USING EMBEDDED C

Programming of Timer & Counter
Programing of Serial Port
Programming of Interrupt
LCD Interfacing
Motor Interfacing
Keyboard Matrix Interfacing

VHDL PROGRAMMING

INTRODUCTION TO VHDL

Need, Scope, Use and history of VHDL
Application of VHDL in market and industries
Special features of this language
Design Process and Steps
Design Simulation and Design Synthesis
• Design Methodology
• VHDL Modeling Styles
• Discussion on VHDL and other languages
• Data Types in VHDL
• Objects in VHDL
• Operators in VHDL

CONDITIONAL STATEMENTS AND LOOPS IN VHDL

• With select statements
• When else statements
• If statement
• Case statement
• Loops in VHDL

STRUCTURAL STYLE & SUBPROGRAMS

• Components
• Benefits of Structural Style
• Structural Style of Modeling

Project work is mandatory after the completion of the training program.