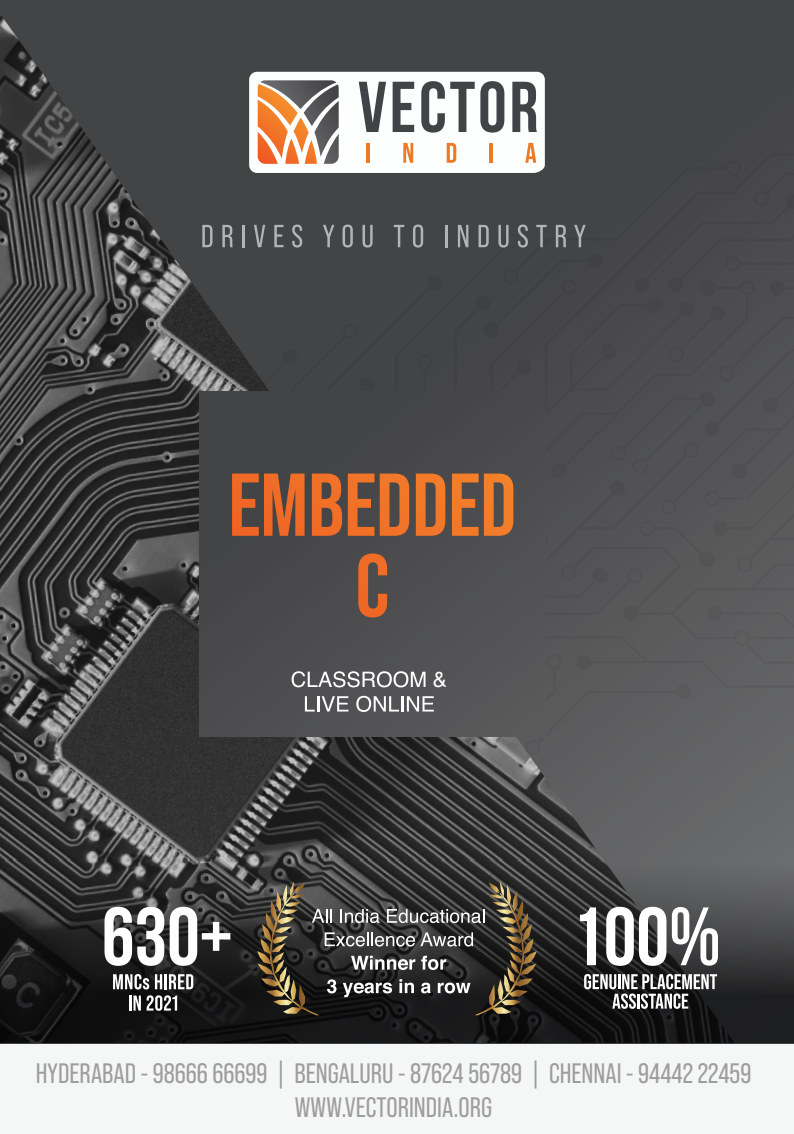

VECTOR
INDIA
DRIVES YOU TO INDUSTRY
EMBEDDED
C
CLASSROOM &
LIVE ONLINE
630+
MNCs HIRED
IN 2021
All India Educational
Excellence Award
Winner for
3 years in a row
100%
GENUINE PLACEMENT
ASSISTANCE
HYDERABAD - 98666 66699 | BENGALURU - 87624 56789 | CHENNAI - 94442 22459
WWW.VECTORINDIA.ORG

EMBEDDED C PROGRAMMING

COURSE DURATION
6 WEEKS

MAKING STUDENTS INDUSTRY-READY WITH APPLICATION-ORIENTED TRAINING PROGRAM!

8051 MICROCONTROLLER

Maximize Your Opportunity in Embedded System with 8051
Micro Python is a lean and efficient implementation of the Python 3 programming language that includes a small subset of the Python standard library and is optimized to run on microcontrollers and in constrained environments.

PROGRAM MODELES

COURSE OBJECTIVE

- Give an understanding about the concepts and basic architecture of 8051
- Provide an overview of difference between microprocessor and micro controller
- Provide background knowledge and core expertise in microcontroller
- Study the architecture and addressing modes of 8051
- Impart knowledge about assembly language programs of 8051
- Help understand the importance of different peripheral devices & their interfacing to 8051
- Impart knowledge of different types of external interfaces including LEDS, LCD, Keypad Matrix, Switches & Seven segment display

DELEGATES WILL BE ABLE TO

- Give an understanding about the concepts and basic architecture of 8051
- Write assembly language program in 8051 for various embedded system applications
- Implement the middle level programming and interfacing concepts in 8051
- Use external interfaces in various embedded system projects
- Create the memory interfacing techniques with 8051
- Create the IO interfacing techniques with 8051

OVERVIEW OF ARCHITECTURE OF 8051

- Processor Core and Functional Block Diagram
- Description of memory organization
- Overview of ALL SFR's and their basic functionality

LOW LEVEL PROGRAMMING CONCEPTS

- Addressing Modes
- Instruction Set and Assembly Language programming (ALP)
- Developing, Building, and Debugging ALP's

MIDDLE LEVEL PROGRAMMING CONCEPTS

- Cross Compiler
- Embedded C language implementation, programming, & debugging
- Differences from ANSI-C
- Memory Models

- Library reference
- Use of #prama directive
- Functions, Parameter passing and return types

ON-CHIP PERIPHERALS STUDY, PROGRAMMING, AND APPLICATION

- Ports: Input/Output
- Timers & Counters
- UART
- Interrupts

EXTERNAL INTERFACES STUDY, PROGRAMMING AND APPLICATIONS

- LEDS
- Switches (Momentary type, Toggle type)
- Seven Segment Display: (Normal mode, BCD mode, Internal Multiplexing & External Multiplexing)
- LCD (8bit, 4bit, Busy flag, custom character generation)
- Keypad Matrix

PROTOCOLS STUDY, PROGRAMMING AND APPLICATIONS

- I2C (EEPROM and RTC)
- SPI (EEPROM)
- I Wire (Sensor)
- Infrared Communications (RC5 protocol)

SELECTIVE DISCUSSION DURING PROJECT DEVELOPMENT

- A/D & D/A Converter
- Stepper Motor, DC Motor
- RF Communication
- RFID
- CAN
- ZIGBEE
- GSM/GPS
- USB
- MMC & SD
- Ethernet MAC

ARM

LEARN THE BASICS OF LOW-COST AND POWER EFFICIENT ARM 7 MICROCONTROLLER

The Advanced RISC Machine has several microcontroller families among which ARM7 are the longest serving ARM processors. The ARM7 CPU core-based microcontroller is the most popular 32-bit embedded processor which features a small microcontroller with low power consumption. We introduce students with the Philips' LPC2000 ARM7 based microcontroller, the first standard microcontroller to integrate ARM7 and Philips' new memory acceleration module. You can apply ARM architecture to almost every embedded application ranging from automotive communications protocol to medical devices and security systems.

Program Modules

COURSE OBJECTIVE

We offer this course with the following objectives:

- Introduce the outline architecture of ARM7 microcontroller including basics of pipelines, registers, exception modes, etc.
- How to set up and customize a microcontroller development environment.
- Give an overview of system peripherals which cover bus structure, memory map, register programming and much more.
- How to write programs that interact with other devices

DELEGATES WILL LEARN

Attending the course on ARM7 series microcontroller will help you learn:

- The hardware implementation of the ARM7 microcontrollers
- Integrated peripherals based on I/O functions
- Examples of internal peripheral software drivers
- The concept of pipelines, registers and exception modes
- ARM7 instruction set covering branching, data processing instructions, swap instruction, THUMB instruction set and others.
- Software development flow and working with projects

After attending course on ARM7 microcontrollers, you can cater your design needs by increasing development through high level abstraction for I/O, communication protocols and a broad range of signal processing.

PHILIPS LPC2000 SERIES (THE ARM7 CPU CORE BASED MICROCONTROLLER) OUTLINE ARCHITECTURE

- The Pipeline
- Registers
- Current Program Status Register
- Exception Modes

THE ARM 7 INSTRUCTION SET

- Branching
- Data Processing Instructions
- Copying Registers
- Copying Multiple Registers
- Swap Instruction
- Modifying The Status Registers

- Software Interrupt
- MAC Unit
- THUMB Instruction Set

SYSTEM PERIPHERALS

- System Peripherals
- Memory Map
- Register Programming
- Memory Accelerator Module
- Memory Map Control
- Bootloader
- External Bus Interface
- External Memory Interface
- Phase Locked Loop
- VLSI Peripheral Bus Divider
- Pin Connect Block
- External Interrupt Pins
- Interrupt Structure

SOFTWARE DEVELOPMENT

- uVision IDE: Embedded C
- Startup Code
- Interworking ARM/THUMB Code
- Locating Code In RAM
- Inline Functions
- Fixing Objects At Absolute Locations
- Inline Assembler

ACCESSING USER ONCHIP PERIPHERALS

- General Purpose I/O
- General Purpose Timers
- Watchdog
- PWM Modulator
- Real Time Clock
- UART
- I2C Interface
- SPI Interface
- Analog To Digital Converter
- Interrupt Service Routines
- Software Interrupt
- Hardware Debugging Tools

AVR Based Embedded Systems

PROGRAM MODULES

INTRODUCTION

- What is Embedded System?
- Microprocessor vs Microcontroller
- CISC vs RISC

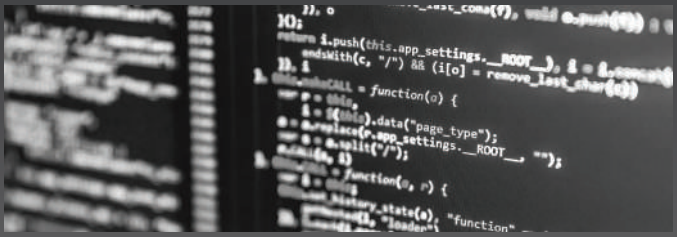
A few words about the family of AVR microcontrollers

OVERVIEW OF ARCHITECTURE OF ATMEGA8515

- Processor Core and Functional Block Diagram
- Description of memory organization
- Overview of ALL SFR's and their basic functionality

LOW LEVEL PROGRAMMING CONCEPTS

- Addressing Modes
- Instruction Set and Assembly Language programming (ALP)
- Developing, Building, and Debugging ALP's



MIDDLE LEVEL PROGRAMMING CONCEPTS

- Cross Compiler
- Embedded C language implementation, programming & debugging
- Differences from ANSI-C
- Library reference
- Use of #prama directive
- Functions, Parameter passing and return types

ON-CHIP PERIPHERALS STUDY, PROGRAMMING, AND APPLICATION

- Ports: Input/Output
- Timers & Counters
- UART
- Interrupts
- SPI
- Analog Comparator

EXTERNAL INTERFACES STUDY, PROGRAMMING AND APPLICATIONS

- LEDS
- Switches (Momentary type, Toggle type)
- Seven Segment Display: (Normal mode, BCD mode, Internal Multiplexing & External Multiplexing)
- LCD (8bit, 4bit, Busy flag, custom character generation)
- Keypad Matrix

PROTOCOLS STUDY, PROGRAMMING AND APPLICATIONS

- I2C (EEPROM and RTC)
- SPI (EEPROM)
- I Wire (Sensor)
- Infrared Communication (RC5 protocol)

SELECTIVE DISCUSSION DURING PROJECT DEVELOPMENT

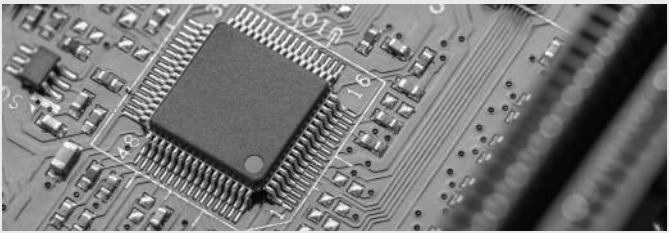
- A/D & D/A Converter
- Stepper Motor, DC Motor
- RF Communication
- RFID
- CAN
- ZIGBEE
- GSM/GPS
- USB
- MMC & SD
- Ethernet MAC

IC

PIC MICROCONTROLLER TRAINING

PIC Microcontroller is a processor with built-in memory and RAM and is manufactured by Microchip Technology. It is a compact microcomputer designed to monitor operations of embedded systems in mostly vehicles, machines and devices. However, it is used in systems, where it is required to control certain processes, obtain information from external sources and to interpret collected information. All electronic devices that are used for household purposes comprises of microcontrollers because in every device there is a need to monitor processes or perform some actions.

Students of Electronics & Telecommunication, Instrumentation and Electrical engineering, who wish to work in PIC microcomputer area, can opt for this PIC microcontroller training. Besides students, even working professionals working on other controller can enroll in the training course to attain proficiency in it. Candidates and professionals are imparted with the skills to work with Programmable Interface Controllers (PIC microcontrollers) at both the hardware and software fronts. By undergoing training program candidates meet the embedded system industry requirements, as they learn to programme the electronic circuits to work for different tasks



PROGRAM MODULES

INTRODUCTION

- What is Embedded System?
- Microprocessor vs Microcontroller
- CISC vs RISC

A FEW WORDS ABOUT THE PIC FAMILY OF MICROCONTROLLERS OVERVIEW OF ARCHITECTURE OF PIC16F877A

- Processor Core and Functional Block Diagram
- Description of memory organization
- Overview of ALL SFR's and their basic functionality

LOW LEVEL PROGRAMMING CONCEPTS

- Addressing Modes
- Instruction Set and Assembly Language programming (ALP)
- Developing, Building, and Debugging ALP's

MIDDLE LEVEL PROGRAMMING CONCEPTS

- Cross Compiler
- Embedded C language implementation, programming, & debugging
- Differences from ANSI-C
- Library reference
- Use of #prama directive

ON-CHIP PERIPHERALS STUDY, PROGRAMMING, AND APPLICATION

- Ports: Input/Output
- Timers & Counters

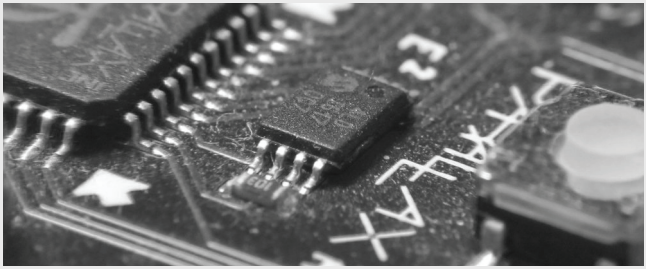
- USART
- I2C
- SPI
- A/D converter
- Interrupts

EXTERNAL INTERFACES STUDY, PROGRAMMING AND APPLICATIONS

- LEDS
- Switches (Momentary type, Toggle type)
- Seven Segment Display: (Normal mode, BCD mode, Internal Multiplexing & External Multiplexing)
- LCD (8bit, 4bit, Busy flag, custom character generation)
- Keypad Matrix

PROTOCOLS STUDY, PROGRAMMING AND APPLICATIONS

- I2C (EEPROM and RTC)
- SPI (EEPROM)
- I Wire (Sensor)
- Infrared Communication (RC5 protocol)



SELECTIVE DISCUSSION DURING PROJECT DEVELOPMENT

- A/D & D/A Converter
- Stepper Motor, DC Motor
- RF Communication
- RFID
- CAN
- ZIGBEE
- GSM/GPS
- USB
- MMC & SD
- Ethernet MAC