

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),

**CONTACT: +91-- 9491535690, +91--7842358459**

## **PIC16F877 SVSEMBEDDED SYSTEMS**

### **COURSE/HOBBY**

## **LEARNING/DEVELOPMENT KIT**

### **Introduction to 'C':**

- About 'C'
- Number system and working examples.
- 'C' Data types/Operators/Precedence.
- Basic GCC commands.
- Refresh Basic 'C' Programming.

### **Learning 'C':**

- 'C' coding style rules.
- Compilation steps.
- Object/Executable file format.
- Linkers/Loaders and functionalities.
- Process image and its sections.
- 'C' process environment on Linux.
- Bit-wise operator's examples
- Preprocessor directives and examples.
- Arrays and Strings.
- Structures/Unions/Enumerations.
- Functions & Pointer.
- Dynamic memory allocation ( Malloc, Calloc, Free).
- Files and Files Operations.

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),

**CONTACT: +91-- 9491535690, +91--7842358459**

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),  
**CONTACT: +91-- 9491535690, +91--7842358459**

- Standard I/O Library.
- Header Files.
- 'C' Program with multiple files.
- Storage classes.
- Const and volatile qualifiers.

- 
- Introduction to Embedded Systems.
  - Architecture of Embedded System.
  - Programming for Embedded System.
  - The Process of Embedded System Development.
  - Communication Interfaces.
  - Embedded/Real-Time Operating Systems.
  - Embedded Software Development on different Microcontrollers.
  - Network Programming.
- 

### **Module-1**

1. Introduction to Microcontrollers.
2. Microcontroller's vs Microprocessors.
3. Introduction to PIC16F877.
4. PIC16F877 Architecture.
5. Basic Registers and addressing modes.
6. Special function Registers.
7. Instruction set.
8. Interrupts & Timers.
9. Programming Microcontrollers in 'C'

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),  
**CONTACT: +91-- 9491535690, +91--7842358459**

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),

**CONTACT: +91-- 9491535690, +91--7842358459**

10. Introduction to MPLAB {or} CCS.IDE Tools.

11. Understanding Basic Devices.

- Light emitting Diodes [LED].
- Switches.
- Liquid Crystal Displays.
- Seven segment display.
- Matrix keypad.
- Replays.
- Buzzers.
- Dc Motors & PWM [Pulse Width Modulation].
- Stepper motors.
- Sensors and signals Conditioning

### **LAB WORKS:**

#### **➤ Building a user Interface**

1. Interfacing a light emitting diode.
2. Interfacing Switches.
3. Interrupts.
4. Timers and counters.
5. Interfacing a LCD Display.
  1. 8bit mode.
  2. 4bit mode.
  3. LCD Menus.
6. Interfacing a 4x4 Matrix Keypad.
7. Pulse Width Modulation.

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),

**CONTACT: +91-- 9491535690, +91--7842358459**

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),  
**CONTACT: +91-- 9491535690, +91--7842358459**



### • Hardware Interfacing Basic Devices

- LED.
- Switches.
- LCD.
- 7-Segment display.
- Keypad.
- Relays.
- Buzzers.
- DC Motors.
- Stepper Motors.

### Module-2

- **Serial Communication.**
  - MAX-232.

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),  
**CONTACT: +91-- 9491535690, +91--7842358459**

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),

**CONTACT: +91-- 9491535690, +91--7842358459**

➤ **Asynchronous Communication.**

- RS-232
- RS-485

➤ **Synchronous Communication.**

- SPI
  - I2C
  - EEPROM
  - Real Time Clock
  - Converters
  - ADC
  - DAC
- Infrared & Radio Frequency.
- Interfacing Microcontrollers.

**LAB WORKS:**

1. RS 232.
2. RS 485.
3. Interfacing Microcontrollers to Microcontrollers.
4. Interfacing Microcontrollers to Computer.
5. SPI Protocol.
6. EEPROM Using I<sup>2</sup>C
7. ADC
8. DAC

**Module-3(learning of technologies)**

• **Interfacing different devices.**

1. WI-FI

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),

**CONTACT: +91-- 9491535690, +91--7842358459**

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),

**CONTACT: +91-- 9491535690, +91--7842358459**

2. BLUETOOTH.
3. GSM.
4. GPS.
5. RF-ID.
6. FRINGER PRINT.
7. RF.
8. Xbee.
9. GRAPHICAL LCD.

#### **Module4: (learning of Protocols)**

##### **Embedded Protocol**

- I<sup>2</sup>C.
- SPI.
- CAN.
- RS 232, RS 485.

#### **Module5: (ACADEMIC PROJECTS ON DEVELOPEMNET KIT)**

The above development board will guide u the 10 different technologies for the student. svsembedded will provide the CD in that

##### **WE WILL PROVIDE**

1. ABSTRACT
- 2.DATASHEETS
- 3.DOCUMENTATION
- 4.SCHEMATIC DIAGRAM.
5. SOFTWARE CODE
- 6.SAMPLE PPT
- 7.PHOTOS&VIDEO FILE ON ENTIRE PROJECT

[www.svsembedded.com](http://www.svsembedded.com) **SVSEMBEDDED** [info@svsembedded.com](mailto:info@svsembedded.com),

**CONTACT: +91-- 9491535690, +91--7842358459**