

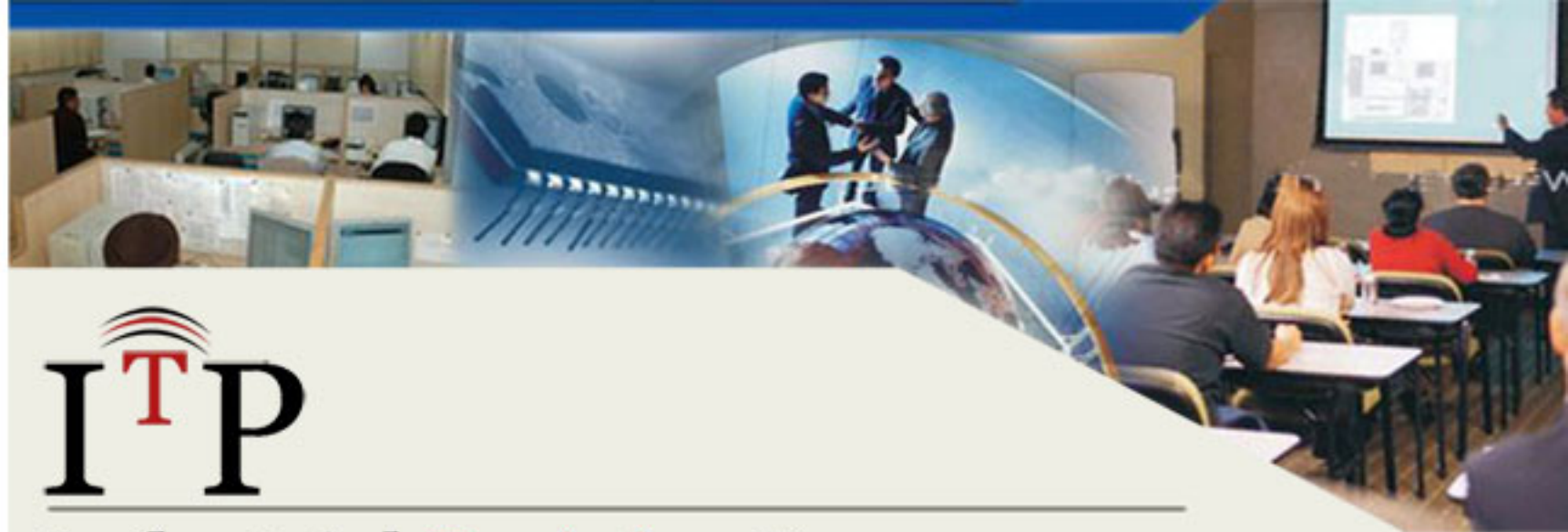
# Industrial Training Programme

## EMBEDDED SYSTEMS :

- ★ Knowledge of Industry Leading 8 bit Microcontroller Architecture.
- ★ Exposure to Protocol Development
  - ◆ ZigBee
  - ◆ CAN
  - ◆ LIN
  - ◆ Embedded Ethernet etc.,
- ★ RTOS, VxWorks 5.6.
- ★ Applications of MEMS, GSM and RFID Technologies.
- ★ Programming and Debugging Tools
- ★ Software Development through Embedded 'C'.
- ★ Hardware and Software Development Cycle.
- ★ Self Constructed Mini Projects.

## VLSI :

- ★ ASIC and FPGA Design Flow.
- ★ Advanced Digital Design Methodologies.
- ★ Architect Design.
- ★ HDL Based Design Methodologies.
- ★ EDA tools:
  - ◆ Xilinx 9.0.
  - ◆ Quartus-II 7.2.
- ★ Embedded Development Kit:
  - ◆ Cyclone-II with NIOS-II Processor.
- ★ RTL Coding and Verification.
- ★ Implement The Design Onto FPGA.
  - ◆ Altera FPGA: Cyclone-I, Cyclone-II.
  - ◆ Xilinx Spartan: Spartan-III, CPLD.
- ★ Industry Standard Mini-Projects.



# I T P

## Industrial Training Programme

If you can dream it, we can create it.



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# EMBEDDED SYSTEM COURSE SYLLABUS

# VLSI - VERY LARGE SCALE INTEGRATION COURSE SYLLABUS

Duration: 60 hrs

## 1. INTRODUCTION

3 hrs

### Embedded System

- Characteristics of Embedded System
- Application Areas
- Real Time Examples
- Embedded System Hardware Design
- Design and Development of Embedded Software
- Real Time Embedded System

### Microprocessor & Microcontroller

- Basic Concepts of Microprocessor
- Basic Concepts of Microcontroller
- Difference between microprocessor and microcontroller
- Introduction to CISC & RISC Architecture
- Memory Organization

## 2. PIC MICROCONTROLLER

7 hrs

- Introduction PIC Microcontroller
- PIC16F877A Architecture and Instruction Set
- PIC Assembly Programming
- Memory Organization
- I/O Ports and SFRs
- Interrupts
- Timers and ADC

## 3. PROTOCOL DEVELOPMENT

7 hrs

- Serial Communication Protocols - USART, SPI, I2C, CAN, LIN

## 4. EMBEDDED C PROGRAMMING

6 hrs

- Data Types and Storage Classes
- Operators and Expressions
- Control Statements
- Functions
- Pointers and Arrays
- Structures and Unions
- Assembler Directives

## PHASE I

### Advanced Digital Design

10 hrs

- Boolean Algebra & Logic Gates
- Boolean Functions
- Combinational Logic
- Sequential Logic
- State Machine Design

### Basics of CMOS VLSI Design

10 hrs

- Introduction to Digital circuits
- Basic CMOS Technology
- Circuit Characterization
- Performance Optimization
- Power Dissipation

## PHASE II

### VHDL / Verilog

10 hrs

- Behavioral Modeling
- Dataflow Modeling
- Structural Modeling
- Advanced Concepts
- Simulation & Synthesis

## LAB EXPERIMENTS

### 5. EMBEDDED REAL TIME INTERFACING

35 hrs

- Interfacing LED
- Interfacing a Switch
- Interfacing of both LED and Switch
- Seven segment interfacing
- Interfacing Timer peripheral
- Interfacing LCD
- Matrix keypad interfacing
- EEPROM peripheral interfacing
- ADC Interfacing
  - 8 bit ADC Interfacing
  - 10 bit ADC Interfacing
- PWM signal generation
- Interfacing of sensor having analog output
- Interfacing of sensor having digital output
- Interfacing PC to PIC Microcontroller using UART
- Interfacing of RF Transmitter and Receiver
- Seven segment interfacing using SPI
- PIC to PIC communication using SPI
- RTC Interfacing using I2C

### PHASE III

20 hrs

- Hardware implementation and Verification
- Projects

### EDA TOOLS

- ModelSim 6.2a
- QUARTUS II
- Xilinx ISE 9.2i Foundation Series

**Vee Eee Technologies Solution Pvt Ltd**