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Training on Embedded Systems & Development

Course	Course Description	Duration	Fee (Rs.)
IE001	Microchip Easy PIC Foundation Course	40 Hrs/5 days	6000
IE002	Microchip Easy PIC Advanced Course	40 Hrs/5 days	6000
IE003	CCS – C Compiler Programming	40 Hrs/5 days	6000
IE004	Advanced Course on Microchip dsPIC Series of 16 Bit Microncontrollers	40 Hrs/5 days	12000

NOTE:

The duration mentioned above is for Guided Hours of teaching by our Trainers & Application Engineers. The participants can avail additional Hands-on Practice at the Centre with the tools for further hours without additional cost and not exceeding another 40 hours within 15 days of the completion of the guided hours.

IE001 Microchip Easy PIC Foundation Course (40 Hrs)–Using PIC 16F Series

Course Duration : 40 Hrs /5 Days
Eligibility : Degree/Diploma in EEE/ECE/IT/EI
Course Fee : Rs. 6000
Batch Size : 5 to 10

This "Hands-on" course provides the participants with an understanding of the Microchip, USA (www.microchip.com) make PIC16F Series of 8-bit microcontrollers and the experience of using Microchip development tools to create and debug assembly language programs. Familiarity with the Windows® environment and fundamental concepts such as bits, bytes, Boolean logic and addressing is pre-requisite for participants. Some experience of assembly language on microprocessors or other microcontrollers will be useful background for an understanding of the more advanced concepts.

Session	Modules
Introductory Session	❖ Embedded System Development Process ❖ Introduction to Microchip PIC Microcontrollers and features of the PIC16C / PIC16F family of microcontrollers ❖ Text Editors/Compilers/Programmers/ Development tools/MPLAB IDE & Introduction to "Easy PIC Development Kit - PIC16F877A"
Practical Session I	❖ Oscillators and Power supply ❖ Two pin and Four pin Crystal Oscillators ❖ Clock Divider Circuit
Practical Session II	❖ Enabling LED Connected to Port B of PIC16F877A ❖ LED Flasher ❖ Interfacing of Seven segment Display with PIC16F877A using Multiplexing technique. ❖ Interfacing a 16 Characters X 2 Rows Backlit LCD.
Practical Session III	❖ Key Switch Connection to PIC16F877A
Practical Session IV	❖ Audio Buzzer interface with PIC16F877A
Practical Session V	❖ Controlling an Electromagnetic Relay
Practical Session VI	❖ RS232 Serial Communication with PC and PIC Microcontroller
Practical Session VII	❖ Inter-Integrated Circuit Bus (I^2C Bus) Programming using EEPROM.
Practical Session VIII	❖ Analog to Digital Conversion using on-chip ADC with 10-bit resolution.
Practical Session IX	❖ Serial Peripheral Interface (SPI) using 12 Bit ADC MCP3202 to PIC 16F877A
Practical Session X	❖ PWM Generation using PIC16F877A Microcontroller
Course Material	❖ Soft copy of the Data sheets, Circuit Diagrams, Source Code & MPLAB IDE are provided in CD-ROM.

IE002 Microchip Easy PIC Advanced Course (40 Hrs) – Using PIC 18F series

Course Duration : 40 Hrs / 5 Days
Eligibility : Degree/Diploma in EEE/ECE/IT/EI
Course Fee : Rs. 6000
Batch Size : 5 to 10

This advanced course is aimed at participants who are familiar with the baseline PIC16F series architecture and would like to enhance their knowledge on the capabilities of the high-end PIC18F series with many system-on-chip features.

Session	Modules
Introductory Session	❖ Overview of Development Tools : MPLAB®, MPSIM, and Microchip In-Circuit Debugger (ICD) ❖ Introduction to device programmers, and the design option of In-Circuit Serial Programming (ICSPTM) ❖ Overview of MPLAB® Linker its relationship to the other MPLAB® components ❖ Introduction to "Easy PIC Development Kit - PIC18F452A and its advanced features
Practical Session I	❖ Create, build and debug projects on the development board using MPLAB® and the ICD and 16 bit op-code for 18Fseries
Practical Session II	❖ Display information on an LCD module ❖ Rewriting PIC 16F assembly codes to PIC 18F microcontrollers
Practical Session III	❖ Create a real-time clock display using timers and interrupts and LCD display
Practical Session IV	❖ Read the values of analogue inputs using the internal and external interfaced A-to-D converter
Practical Session V	❖ Collect data in the background using an interrupt handler routine
Practical Session VI	❖ Measure the period of a pulse train using the capture/compare module ❖ Analog interfacing
Practical Session VII	❖ Set up a Pulse Width Modulation (PWM) output with a variable duty cycle and frequency ❖ SPI, I2C, EEPROM storage and retrieval functions
Practical Session VIII	❖ Communicate with a PC over a serial interface using the USART peripheral ❖ Interfacing external devices like, RF transmitter/receiver, sensors, power bridge to PIC 18F series microcontrollers
Course Material	❖ Soft copy of the Data sheets, Circuit Diagrams, Source Code & MPLAB IDE are provided in CD-ROM

IE003 CCS – C Compiler Programming (40 Hrs)

Course Duration : 40 Hrs / 5 Days
Eligibility : Degree/Diploma in EEE/ECE/IT/EI
Course Fee : Rs. 6000
Batch Size : 5 to 10

Custom Computer Services (CCS) Inc, USA (www.ccsinfo.com) is a Microchip authorized third party vendor of C compilers and Development tools for PIC Microcontrollers. Knowledge of C language programming is required for the participants of this course.

Session	Modules
Introductory Session	❖ Introduction to Custom Computer services (CCS) Inc, USA line of C Compilers & Development tools
Practical Session I	❖ Integration of PCM/PCWH compiler with Microchip MPLAB IDE.
Practical Session II	❖ Programming using CCS – C Compiler in Command line Versions – (PCM & PCH Compilers).
Practical Session III	❖ Using inbuilt libraries and Code examples ❖ Integrating ICD-U40 with PCWH editor
Practical Session IV	❖ Coding for interfacing of Seven segment Display with PIC16F877A using multiplexing technique
Practical Session V	❖ Compiler code for interfacing a 16X 2 Backlit LCD
Practical Session VI	❖ Coding practice for switch connection, audio buzzer interface, electromagnetic relay control with PIC16F877A
Practical Session VII	❖ Data communication coding using CCS C for RS232, Inter-Integrated Circuit Bus (I^2C Bus) Programming, Serial Peripheral Interface (SPI) for PC to microcontroller communication ❖ EEPROM ADC coding using on-chip ADC with 10-bit resolution
Practical Session VIII	❖ External Serial Peripheral Interface (SPI) using 12 Bit ADC MCP3202 to PIC 16F877A ❖ PWM Generation using PIC16F877A Microcontroller
Practical Session IX	❖ Interfacing USB port using USB Development kit
Practical Session X	❖ Introduction to CAN bus programming using CCS CAN bus development kit
Course Material	❖ Soft copy Source Code for above examples, MPLAB IDE, CCS C compiler Demo version are provided in CD-ROM.

IE004-Advanced Course on Microchip dsPIC 16 Bit Microcontrollers (40 Hrs)

Course Duration : 40 Hrs / 5 Days
Eligibility : Degree/Diploma in EEE/ECE/IT/EI
Course Fee : Rs. 12000
Batch Size : 5 to 10

The high end Digital Signal Controller (DSC) offered by Microchip is the dsPIC series of devices that incorporates both DSP and 16 bit microcontroller features. This dsPIC is unique in many ways and the applications involving 16 bit microcontrollers are fast emerging trend of the near future. Participants with knowledge of 8 bit microcontrollers are preferred for this advanced course.

Session	Modules
Introductory Session 1	❖ Introduction to 16 Bit Microcontroller ❖ Multimedia tutorial on dsPIC® features and peripherals
Introductory Session 2	❖ Introduction to Easy dsPIC development board ❖ Overview of programming the dsPIC® in 'C' and Assembler ❖ MPLAB C compiler C 30 for dsPIC development
Practical session 1	❖ Implementing embedded functions on dsPIC® microcontroller – On chip EEPROM, ADC & USART.
Practical session 2	❖ Interfacing of LED, 7 Segment LED & LCD with dsPIC®
Practical session 3	❖ Buzzer and Relay Activation using dsPIC
Practical session 4	❖ ADC and DAC Interfacing techniques to dsPIC® microcontroller dsPIC30F2010
Practical session 5	❖ DC Motor Speed and Direction Control using dsPIC
Practical session 6	❖ Stepper Motor Control application using dsPIC
Practical session 7	❖ Implementing Fractional HP single phase AC Induction Motor Control using dsPIC.
Course Material	❖ Soft copy Source Code for above examples, MPLAB IDE and dsPIC C 30 demo version are provided in CD-ROM.

Products & Solutions offered by Winnii:

Embedded Systems Training & Solutions:

- Training on Embedded Solutions using 8 bit and 16 bit microcontrollers.
- A wide range of Trainer / Development kits are offered.
- Setting up of Embedded Systems Training Laboratory for Universities.
- Project Work Guidance for Embedded Systems for PG & UG students.

Wireless Products Offered:

- ISM Band RF 433.92 MHZ based Wireless Modules and Solutions
- RFID Development Kits
- Bluetooth Development Kits
- Zigbee Development Kits & Modules
- 2.4GHZ RF/Wireless Transceiver based Data Communication System

Embedded Systems Development Support:

- Design Consultancy for Product Development from concept to design using the latest Microcontroller Technologies from Industry Leaders such as Microchip, Freescale and Cypress.
- Winnii is Design Consultant and Design Alliance Partners for some of these industry names in Microcontroller based product development in India.

Winnii Solutions Private Limited is a Chennai based company promoted by technocrats with two decades of experience in Electronics, Communication and Wireless Technologies. Our main focus is In WEST – meaning Intelligent Wireless, Embedded Solutions and Training. We are providing Product Development, Project and Training solutions in new generation embedded and wireless technologies using our practical expertise catering to both industry and educational institutions and aspiring Engineering students.
Our offer also includes complete turnkey solution to institutions, colleges for setting up of Lab / Centre of Excellence based on Embedded Systems and Wireless communication technologies. We provide all these solutions as a single source of supply with complete technical support.
We have designed and developed several embedded and wireless application development and trainer kits using latest technologies and development tools meeting the industry requirements. Product Development Consultancy Services are also offered from Winnii for design of new products and solutions.

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