Revised

CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING
A-34, PHASE VIII, INDUSTRIAL AREA, MOHALI
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INDUSTRIAL TRAINING ON PROFESSIONAL ELECTRONICS

DURATION : 26 WEEKS (4hrs a day)

ELIGIBILITY : B. Tech/B.E 3rd / Final Year students of ECE,EEE, OR equivalent

COURSE CONTENTS

MODULE	Week	No. of Weeks
MODULE 1: BASIC ELECTRONIC COMPONENTS ♦ Introduction & Classification to electronic components ♦ Applications of electronics ♦ Passive components: capacitors, resistors, inductors ♦ Resistance color coding ♦ Active components transistors, diodes, IC's etc. ♦ Power sources: Signal generators and DC power supplies ♦ Visual interaction with real components ♦ Power supply making ♦ Introduction to Lab Equipments o Basics of Lab equipments tools o Basics of Soldering o CRO o Multi-meter o Function Generators o Practice on all Lab equipments	**Week -1**	**1**
MODULE 2 : ANALOG CIRCUIT DESIGN ♦ Filters and wave shaping (Op-amps) ♦ Basic Op-amp circuits ♦ Integrator ♦ Differentiators ♦ Filters ♦ Sample and hold circuits ♦ Op-amps Circuit waves analysis on CRO	**Week -2 to Week -3**	**2**

MODULE 3 : EMBEDDED SYSTEM DESIGN ♦ Microcontrollers: Introduction, uses, types ♦ Evolution of 8051,PIC, AVR Complete architecture and Programming needs ♦ Instruction Set Architecture: Addressing Modes Programming ♦ Data Handling Programming (Branching Instruction), Arithmetic/Logical) ♦ Timers and Counters, Interrupts, Interrupt handling ♦ Basic C Programming concepts. ♦ Firmware development using Embedded C ♦ Programming , Testing, Debugging ♦ Microcontrollers Interfacings ○ LED, LCD, switch, relay ○ ADC, ○ Interrupts ○ Communication protocols – UART,SPI, I^2C	**Week -4 to Week -7**	**4**
MODULE 4 : STM32 DISCOVERY KIT ♦ Introduction to Advanced Embedded Systems & 32 bit ARM Architecture ♦ Introduction to ST Microelectronics STM32 Processor based on ARM Architecture ♦ Exposure to Hardware/Software Platforms used in Advanced Embedded Systems ♦ Real world interfaces and its embedded programming ♦ Usage of the GPIO pins, Analog Digital Converter, Timer, USART Communication	**Week -8 to Week -10**	**3**
MODULE 5 : INTRODUCTION TO MEDICAL DEVICES AND THEIR NEEDS ♦ ECG – Basic ~~Circuits~~ Blocks, waveforms ♦ Pulseoximeter– Basic ~~Circuits~~ Blocks, waveforms ♦ BP machine– Basic Circuits, waveforms	**Week -11**	**1**
MODULE 6 : INTRODUCTION TO AGRI ELECTRONICS: ♦ Green house systems, Hydroponics systems ♦ Sensors: CO2, Temperature, Humidity, Light ♦ Actuators : Relays, Humidifiers, AC control, PAR light control ♦ Power management and Sensor networking Protocols	**Week -12**	**1**
MODULE 7: DIGITAL ELECTRONICS ♦ Number systems ♦ Logic Circuits ♦ Boolean Algebra and Mapping methods ♦ Logic Function Realization with Multiplexers and Decoders ♦ Latches, Flip Flops, Counters and Registers ♦ State Machines- Mealy/ Moore type FSM	**Week -13**	**1**

MODULE 8 : VERILOG HDL ♦ Introduction to HDL ♦ Data Types ♦ Data objects ♦ Syntax and semantics ♦ Introduction to EDA Tools ♦ Introduction to Verilog HDL ♦ Various Modeling styles ♦ Task and Functions ♦ Specify Block and Timing Checks	**Week -14 to Week -17**	**4**
MODULE 9 : FPGA PROTOTYPING ♦ Introduction to FPGA ♦ FPGA building blocks ♦ FPGA prototyping ♦ Testing	**Week -18**	**1**
MODULE 10 : CMOS BASED ANALOG DESIGN CONCEPTS ♦ Introduction to CMOS ♦ CMOS logic, gates ♦ CMOS based design approaches	**Week -19 to Week -21**	**3**
MODULE 11 : INTRODUCTION TO EMERGING TECHNOLOGIES ♦ Internet of Things (IoT) ♦ 5G Technology ♦ Quantum Computing ♦ Artificial Intelligence ♦ Android	**Week -22**	**1**
MAJOR PROJECT: **in advanced Embedded and VLSI design applications** ♦ All trainees will submit a project report which will be having significant contribution in total grading for the training.	**Week -23 To Week -26**	**4**

HOW TO APPLY: For Admission, submit your College reference/training letter, admission form (download from www.cdac.in) along with fee at CDAC, A-34, Phase 8, Industrial Area, Mohali.

NOTE:

- Seats are limited and admission is on first come first serve basis.
- 75% attendance is must for award of certificate.