Hewlett Packard Enterprise

Course Datasheet

VLSI, VHDL & PCB Design

Education Services course product number – HPE-VLSI-v1.0
Course length – 60 Hrs.
Delivery mode – Instructor Led Training (ILT)
                         Virtual Instructor Led Training (vILT)

The program covers the concepts related to VLSI, VHDL and PCB Design, Mosfet Details, Mosfet Models, CMOS Fabrication Process, Digital Fundamentals and design, Analog Fundamentals and design, CMOS Circuit Characterization, CMOS logic Design, Memories, Schematic simulation, IC Layout and simulation, HDL and PCB design.

Course Objective

This 60 hours training program will help participants understand the basic concepts of Integrated Circuits, modern semiconductor technology and detailed analysis of designing of electronic circuits, both analog and digital.

Prerequisite

No experience is required however basic knowledge of circuits and circuit solving (like KCL and KVL) will be an added advantage.

Course Modules

Chapter 01 – Introduction

- History
- VLSI Methodologies and Technologies Trends

Chapter 02 – CMOS Fabrication Process

- The CMOS Technology
- CMOS Inverter Design

Chapter 03 – Digital Fundamentals

- Boolean Algebra
- Logic Gates
- Logic Gates
- K-Map

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Chapter 04 – CMOS Circuit Characterization

- Resistance Estimation
- Capacitance Estimation
- Delay Calculation
- Power Consumption

Chapter 05 – CMOS Logic Design

- Combinational Logic (CMOS)
- Pseudo nmos/pmos, Pass Transistor, Transmission Gates
- Dynamic CMOS Logic (Domino, np-CMOS, NORA)
- Sequential Logic

Chapter 06 – Memories

- Basics of Semiconductor Memories
- Memory Organization
- RAM,ROM,EEPROM,FLASH Memories

Chapter 07 – Analog Design

- Analog Design Introduction
- Small Signal Analysis of CMOS
- Single Stage Amplifier Design
- Operational Amplifier Design

Chapter 08 – Schematic simulation

- Software introduction
- MOS simulations
- Models associated
- Simulating a large circuit

Chapter 09 – IC Layout

- Software introduction
- layout rules
- Innovative Layout styles
- Understanding layouts
- Passive component design
- Process technologies
- DRC
- LVS
- PEX

Chapter 10 – VHDL

- What is VHDL?
- Basic Terminology and Coding Style
- Language Elements
- Behavioral Modeling
- Structural Modeling
- Data Flow Modeling
- Software introduction

Chapter 11 – PCB Layout

- Difference between IC layout and PCB layout
- Software introduction
- Demonstration