

Certificate course in VLSI design

Duration: 60hrs (6 weeks/@2hours daily)

Course Outline

Section	Topics to be covered	Duration (In Hours)
1	Introduction to VLSI	10
2	Review of Advanced Digital Design	15
3	Hardware description language (Verilog HDL)	20
4	FPGA prototyping & Architecture	15
Total Duration		60

Course Contents

Introduction to VLSI

Introduction , VLSI Design Flow, Design Hierarchy , Concepts of Regularity, Modularity and Locality ,VLSI Design Styles , Design Quality ,Packaging Technology ,Computer-Aided Design Technology

Review of Advanced digital design

Combinational circuits, Glitches and Hazards: Static Hazards, Dynamic Hazards, Building Blocks for Logic design: Nand-Nor Structures, Multiplexers, Encoders, Priority Encoders, Decoders, Fundamentals of sequential logic design-Storage elements: Latches, Flip flops, Design of State machines

Hardware description language(Verilog HDL)

Introduction to HDL, Design flow diagram, Hierarchical Modelling Concepts- Top-to-down methodologies, Bottom-to-up methodologies, Gate level modelling, Concept of various types of delays, Behavioral modelling, Implementation of Conditional statements, Design problems, State table entries, Switch level modelling-Designing of MOS , bidirectional switches, User defined primitives(UDP).

FPGA prototyping & Architecture

Programmable logic devices(PLD)-PROM,PLA,PAL. Complex programmable logic devices(CPLD),Introduction to FPGA-FPGA architecture, Types of FPGA's, Application of FPGA's, Different boards of FPGA, FPGA prototyping, Design partitioning, Timing analysis in FPGA, concept of Clock Skew.