

Skill development programme on FPGA based System Design

- 1) Introduction to FPGA.
 - a. FPGA architecture and FPGA design flow
 - b. Different type of FPGAs (Xilinx boards etc.)
 - c. Working with XILINX IDE ISE 14.7 / VIVADO
- 2) Hardware Programming skills in Verilog /VHDL.
 - a. Introduction programming using Verilog /VHDL
 - b. Types of programming language (VHDL and Verilog) and their advantages/disadvantages
 - c. How to make programming more efficient with less number of coding lines.
 - d. Writing synthesizable code
 - e. Training with Real Time debugging and board level debugging
 - f. Training on checking signal integrity -simulations and tools regarding that (as we will be using high speed peripherals)
- 3) Verification of Design
 - a. Simulation part of the code and finding out the errors in simulation.
 - b. Writing Test bench for verification
- 4) High level Programming skills in C and SystemC
 - a. Introduction programming using C and SystemC
 - b. Flow of High level Synthesis.
 - c. Writing Test bench for verification
- 5) Timing constraints
 - a. Static and Dynamic timing analysis
- 6) Area, Performance and Power Analysis
 - a. Power integrity verification
- 7) VLSI Architectures for various applications
- 8) Hardware software codesign Flow.
 - a. Introduction to software-hardware co-design
 - b. Hardware-software codesign using Vivado
 - c. Hardware-software codesign Xilinx System generator with MATLAB
 - d. Pre and post synthesis simulation using Modelsim
- 9) VLSI Architectures case studies for various applications
 - a. DSP with case study
 - b. Video and Multimedia with case study
 - c. Memory controller with case study
 - d. Study on IP design
 - e. Machine Learning Algorithms