

CAD for VLSI design

Introduction to Reconfigurable computing, FPGAs, FPGA Programming Technologies, Logic Cell Structures, Programmable Interconnect and I/O Ports, Implementation of Combinational Circuits, Sequential Circuits, Arithmetic Circuits, Programming FPGAs in Electronic Systems. Xilinx FPGAs – Spartan, Virtex and Kintex, Actel (Microsemi) FPGA, Altera FPGA.

System-On-Chip Design. SoC Design Flow, Platform-based and IP based SoC Designs, Basic Concepts of Bus-Based Communication Architectures, On-Chip Communication Architecture Standards and Low-Power.

Xilinx all programmable SOC, Multimedia processing SoC (MPSoC), UltraScale+ MPSoC. Application Processing Unit, Introduction to the members of the APU, Cortex™-A53 processor. Cluster configuration and management.

Soft-core processors. Architecture and General Purpose Registers, Bus Interfacing, MMU, and Interrupts. Configurable features of the Processor. LEON3, MicroBlaze, Nios II, Open RISC processor details.

CAD tools. Integrated Software Environment (ISE), Comprehensive front-to-back design environment from design entry through Xilinx device programming and verification. Embedded development kit (EDK), designing embedded processor systems on programmable logic. Chip scope pro. In-circuit logic analysis of FPGA design.

Text Books:

1. Stephen M. Trimberger, "Field-Programmable Gate Array Technology", Springer, 2012.
2. M.J.S. Smith, "Application Specific Integrated Circuits", Pearson, 2008.
3. S. Sutherland, S. Davidmann, P. Flake, "System Verilog For Design", (2/e), Springer, 2006.

Reference Books:

1. P. Chu, "FPGA Prototyping by Verilog Examples," Wiley, 2008
2. P. Chu, "FPGA Prototyping by VHDL Examples," Wiley, 2008
3. Robert Ashby, "Designer's Guide to the Cypress PSoC, Newnes (An imprint of Elsevier)", 2006
4. O.H. Bailey, "The Beginner's Guide to PSoC", Express Timelines Industries Inc.
5. Xilinx User Manuals and Application Notes

Senate

RW

79