Course Name: Advanced VLSI Design

Faculty Name: Prof. A. N. Chandorkar

Institute Name: IIT Bombay

Historical Perspective and Future Trends in CMOS VLSI Circuit and System Design, Logical Effort - A way of Designing Fast CMOS Circuits, Power Estimation and Control in CMOS VLSI circuits, Low Power Design Techniques, Arithmetic Implementation Strategies for VLSI, Interconnect aware design: Impact of scaling, buffer insertion and inductive peaking, Interconnect aware design: Low swing and Current mode signaling, Interconnect aware design: capacitively coupled interconnects, Introduction to Hardware Description Languages, Managing concurrency and time in Hardware Description Languages, Introduction to VHDL, Basic Components in VHDL, Structural Description in VHDL, Behavioral Description in VHDL, Introduction to Verilog, FSM + datapath (GCD example), Single Cycle MMIPS, Multicycle MMIPS, Brief Overview of Basic VLSI Design Automation Concepts, Netlist and System Partitioning, Timing Analysis in the context of Physical Design Automation, Placement algorithm, Introduction to VLSI Testing, VLSI Test Basics, VLSI Testing: Automatic Test Pattern Generation, VLSI Testing: Design for Test (DFT), VLSI Testing: Built-In Self-Test (BIST), VLSI Design Verification: An Introduction, VLSI Design Verification: An Introduction, VLSI Design Verification: Equivalence/Model Checking, VLSI Design Verification: Model Checking