VLSI Technology

1. VHDL & FPGA/CPLD Designing

- Introduction about VHDL and VLSI technology
- Scope of VLSI Technology
- Market & Job Prospects of VLSI Technology
- Introduction about HDLs
- Types of HDLs
- Scope of HDLs
- Types of Modeling
    - Data Flow
    - Behavioral
    - Structural
    - Mixed
- Data flow style
- Concept of data flow
- Circuit Designing by dataflow
- Combinational circuit implement by dataflow
- Data types
- Scalar
- Composite
- Operators
- Timing delay
    - Inertial delay
    - Transport delay
- Behavioral modeling
- Designing of sequential circuit
- Designing of FF
- Concept of asynchronous and synchronous circuit
- Counters
- Subprogram
- Functions
- Tasks
- Package and Package Body
- Structural modeling
    - Positional methodology
    - Named methodology
- Designing & Application of resistors

- PIPO & PISO reg.
- SISO & SIPO reg.
- FIFO AND FILO buffer
- State machine implémentation
- Traffic light controller
- Design a mini project
- Different types of counter
- Decimal counter
- 8 bit ripple counter
- 8 bit Johnson counter
- Ring counter
- Many more
- Looping Concept
- Designing of Advance Circuits
  - ALU/Calculator 64bit
  - Comparator
  - Digital watch
  - Microwave counter
  - Stop watch
  - Shift Unit
  - Many more
- VHDL Test Benches
  - Test bench concept
  - Method of writing test bench
- Projects

2. **FPGA/CPLD Designing**

- What is Synthesis
  - Pre & post synthesis
  - Placement & routing
  - Mapping
- Differ from Synthesis & simulation
- Description about FPGA
- Description about CPLD
- Method of implementation of HDL code in to memory device
- Types of file
  - .bit file
  - EPROM file

- o JTAG
  - o Boundary SCAN method
- Interfacing
  - o LED interfacing
  - o Switch interfacing
  - o Clock division
  - o 7-Segment interfacing
  - o Serial & Parallel interfacing
- Implementation of HDL code into FPGA & CPLD
- Implementation of minor project
- Implementation of Major project