

CETPA INFOTECH PVT. LTD.

CURRICULUM OF VLSI

INTRODUCTION TO VLSI

- Need, Scope, Use and History of VLSI.
- Introduction to Chip Design Process.
- Description of Hardware Description Languages
- VLSI Design Flow
- Applications of VLSI.

INTRODUCTION TO VHDL

- Need, Scope, Use and History of VHDL.
- Applications of VHDL in Market and Industries.
- Special Features of this Language.
- Discussion of VHDL & other Languages.

DESIGNING IN VHDL

- Design Process and Steps.
- Design Simulation
- Design Synthesis.
- Design Methodology
 - Top Down
 - Bottom Up

CODE STRUCTURE

- Library Declaration
- Entity
- Architecture
- Configuration

DATA TYPES & OBJECTS IN VHDL

- Variables
- Constants
- Signals
- Delta Delay
- Operators in VHDL
 - Shift Operator
 - Relational Operator
 - Arithmetic Operator
- User-Defined Data Types
- Pre-Defined Data Types
- Arrays
- Record

DATA FLOW MODELING

- Keyword description of Dataflow Modeling.
- When else statement.
- With Select Statement.

BEHAVIORAL MODELING

- Process Keyword.
- Conditional Statements
 - If else statement
 - Case statement
- Loops in VHDL
 - For Loop
 - While Loop
 - No Iteration Scheme Loop

- Sequential Circuits in Behavioral Modeling
 - Flip-Flops
 - Counters
- Combinational Circuits in Behavioral Modeling
 - Decoder
 - Encoder
 - Multiplexer
 - Logic Gates
- Attribute
 - Signal Attribute
 - Data Attribute
 - User-Defined Attribute
- Package
 - Pre-defined Package
 - User-defined Package
- Sub programs.
- Function.
 - Local Function
 - Pre-defined Function
- Procedure.
 - Local Procedure
 - Pre-defined Procedure
- NULL Statement
- NEXT Statement
- EXIT Statement

STRUCTURAL MODELING

- Benefits of Structural Modeling.
- Components.
- Component Interfacing
- Port Mapping

FINITE STATE MACHINE

- Introduction to FINITE STATE MACHINE (FSM).
- Moore's Machine.
- Mealy Machine.
- Counters (MOD-3, MOD-5, MOD-7)
- Flip Flops using FSM.

SHIFT REGISTERS & MEMORIES

- SISO
- PIPO
- SIPO
- PISO
- Memory Design
 - RAM
 - ROM

MINOR PROJECTS

- Design of ALU
- Traffic Light Controller
 - Single way
 - Four way

- Design of Shift Unit
- Design of Comparator
- Booth Multiplier
- Wallace Tree Multiplier

HARDWARE INTERFACING

- Introduction to FPGA.
- Introduction to CPLD.
- Brief Description of Hardware KIT.
- Working on Physical FPGA & CPLD.
- Interfacing of LED's.
- Keypad Scanner

BEHAVIORAL MODELING ADVANCED TOPICS

- MEMORY DESIGN – RAM / ROM.
- CLOCK DIVIDER RTL

HARDWARE INTERFACING ADVANCED TOPICS

- 7 Segment interfacing.
- Counter on 7-Segment.
- LCD Interfacing.

ADVANCE TOPICS

- Test bench.
- Delays in VHDL.
- Generics & generic map.
- Guarded block.
- Overloading
 - Operator overloading.
 - Function overloading.

INTRODUCTION TO VERILOG HDL

- Needs of VERILOG HDL.
- Difference between Verilog HDL & VHDL.
- Application of Verilog HDL
- Market Need.

MAJOR PROJECTS

- TLC- 4 Road / 1 Way on FPGA / CPLD XILINX SPRTAN 3E.

MAJOR PROJECTS

Project list mentioned on--

<http://www.cetpainfotech.com>

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