## 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

## MAJOR PROJECTS
- Project list mentioned on--
  [http://www.cetpainfotech.com](http://www.cetpainfotech.com)