



# **Report**

# **Workshop**

on

## **“Digital VLSI Design and Synthesis using Cadence EDA Tools”**

**21<sup>st</sup> – 22<sup>nd</sup> April, 2025**

**Coordinator:** Prof. G. D. Makwana  
**Co-coordinator:** Prof. Parth Chauhan

GTU- School of Engineering and Technology organized two days’ workshop on “**Digital VLSI Design and Synthesis using Cadence EDA Tools**” during 21<sup>st</sup> – 22<sup>nd</sup> April, 2025.

The objectives of the workshop are: 1) Familiarize participants with high-end IC simulation and synthesis tools 2) Build foundational digital logic design knowledge 3) Cover VLSI design principles and CMOS device behavior 4) Enhance RTL design proficiency with Verilog/VHDL 5) Teach complete design flow: simulation → synthesis → place & route.

27 participants participated in the workshop. UG students.

### **Session Details**



**Session by Prof. G. D. Makwana**

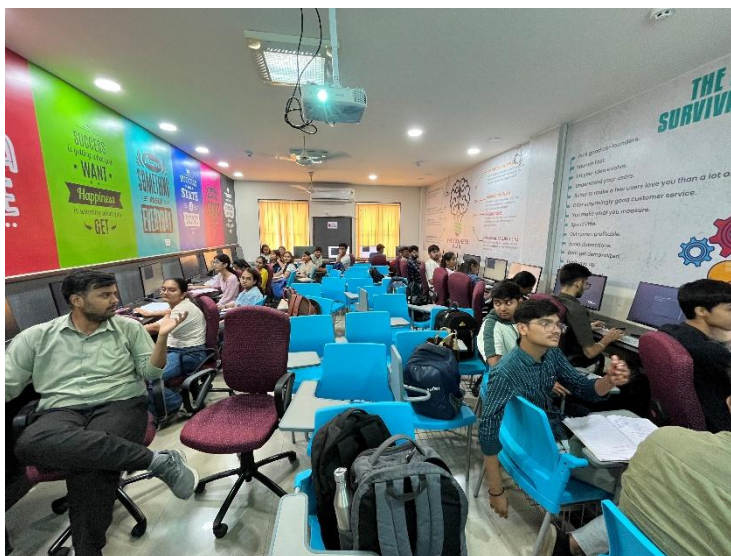
### **Topics Covered**

- Fundamental building blocks—AND/OR/NOT gates
- Boolean algebra rules and truth-table analysis
- Combinational circuits (adders, multiplexers)
- Introduction to sequential elements (flip-flops, registers)



**Session by Prof. Rajesh A. Thakker**

- CMOS transistor basics (NMOS vs. PMOS operation)
- MOSFET device characteristics and scaling challenges
- Overview of the VLSI design
- Role of CAD tools in chip planning, placement, routing



**Session by Prof. Parth Chauhan**

- HDL syntax for combinational logic
- Coding & simulating a 4-bit adder in Verilog
- Writing basic testbenches
- Sequential designs and FSM coding
- Parameterized modules and generate constructs
- Advanced testbench features



**Session by Prof. Parth Chauhan**

- Installing and configuring Xcelium, Genus, and Innovus on Linux
- Running RTL simulations with Xcelium
- Performing synthesis in Genus
- Introduction to place-and-route in Innovus
- RTL-to-gate translation using **Genus**
- Defining timing constraints and clock trees
- Interpreting area, timing, and power reports
- Discussing speed vs. area vs. power trade-offs

**Details of the Participants**

<b>No.</b>	<b>Full Name</b>	<b>Designation</b>	<b>Name of Organization</b>
1	BHALODIYA YASHVI SHANTIBHAI	UG Scholars	GTU - School of Engineering and Technology
2	BHAVSAR NISARG PRADIPKUMAR	UG Scholars	GTU - School of Engineering and Technology
3	CHAUHAN RITIKA DILIPBHAI	UG Scholars	GTU - School of Engineering and Technology
4	DARSHKUMAR DOBARIYA	UG Scholars	GTU - School of Engineering and Technology
5	DHAIRYARAJ SUMESARA	UG Scholars	GTU - School of Engineering and Technology
6	DUBEY PRABHA SANTOSHKUMAR	UG Scholars	GTU - School of Engineering and Technology
7	DUTT RISHEEKA	UG Scholars	GTU - School of Engineering and Technology
8	FAPALE ISHWARI ANILBHAI	UG Scholars	GTU - School of Engineering and Technology
9	HARSHKUMAR PATEL	UG Scholars	GTU - School of Engineering and Technology
10	KAAVYA KAMDAR	UG Scholars	GTU - School of Engineering and Technology
11	KHUSHI PATEL	UG Scholars	GTU - School of Engineering and Technology
12	KRISHNARAJ SINH HITESH DODIYA	UG Scholars	GTU - School of Engineering and Technology
13	MAHIR MANOJKUMAR PATEL	UG Scholars	GTU - School of Engineering and Technology
14	MAKWANA VIR .S	UG Scholars	GTU - School of Engineering and Technology
15	MARIYA TAHER FAKIH	UG Scholars	GTU - School of Engineering and Technology
16	MIT PANCHAL	UG Scholars	GTU - School of Engineering and Technology

17	PADARIYA KASHYAP	UG Scholars	GTU - School of Engineering and Technology
18	PATEL SUCHI DILIPKUMAR	UG Scholars	GTU - School of Engineering and Technology
19	PRAGADA NIDHI	UG Scholars	GTU - School of Engineering and Technology
20	PRAJAPATI AVANI HITENDRABHAI	UG Scholars	GTU - School of Engineering and Technology
21	PRAJAPATI HARSHKUMAR RAKESHKUMAR	UG Scholars	GTU - School of Engineering and Technology
22	PRAJAPATI HELLY GOVINDBHAI	UG Scholars	GTU - School of Engineering and Technology
23	PRANAV JAIN	UG Scholars	GTU - School of Engineering and Technology
24	PRATHAM MODI	UG Scholars	GTU - School of Engineering and Technology
25	SARVA PATEL	UG Scholars	GTU - School of Engineering and Technology
26	TANIA MAJITHIA	UG Scholars	GTU - School of Engineering and Technology
27	VOHERA MAHI PARESHKUMAR	UG Scholars	GTU - School of Engineering and Technology