



**GUJARAT TECHNOLOGICAL UNIVERSITY**

**INTERNATIONAL INNOVATIVE UNIVERSITY**

**Accredited with A+ grade by NAAC**

## **School of Engineering and Technology**

**Report**

**on**

**Faculty Development Program**

**of**

**“Semiconductor Electronics Design Automation (EDA) Tools”**

**Jointly organized with**

**Entuple Technologies Pvt. Ltd, Bangalore**

**&**

**Eigen Technologies Pvt. Ltd. Guragaon**

**From Date:- 02/09/2024 to 06/09/2024**



- **Introduction:**

The Inauguration Ceremony of the Faculty Development Program on “Semiconductor Electronics Design Automation (EDA) Tools” marked the beginning of an intensive and collaborative learning experience. Jointly organized by Entuple Technologies Pvt. Ltd., Bangalore, and Eigen Technologies Pvt. Ltd., Gurgaon, this program ran from September 2nd to September 6th, 2024. The event aimed to equip participants with cutting-edge knowledge and practical skills in EDA tools, a critical area in semiconductor electronics.

- **Lightning Ceremony by Delegates:**



The event commenced with a traditional lamp-lighting ceremony, symbolizing the dispelling of darkness and the pursuit of knowledge. Distinguished guests, including key representatives from Entuple Technologies Pvt. Ltd., Bangalore, and Eigen Technologies Pvt. Ltd., Gurgaon, joined the faculty members in lighting the ceremonial lamp. The glow of the flames reflected the collective commitment to

enlightenment, growth, and innovation in the field of semiconductor technology. This auspicious start set a positive tone for the program, inspiring participants to engage fully in the learning and development opportunities that lay ahead.

- **Welcome Note:**



**Speaker:- Dr. R. A. Thakker**

Dr. R. A. Thakker inaugurated the Semiconductor Faculty Development Program with a warm welcome, expressing his enthusiasm for the event. He underscored the critical role of semiconductors in today’s technological advancements and highlighted the program’s importance in bridging knowledge gaps and fostering professional development.

- **Delegates' Speeches**



**Speaker:- Vyom Sharma**

Vyom Sharma delivered an insightful presentation on the pivotal role of semiconductors across diverse industries. He explained how semiconductors are foundational to modern technology, influencing sectors such as automotive, telecommunications, and consumer electronics. Sharma also provided an overview of Eigen Industry, showcasing its contributions and innovations in the semiconductor field.



**Speaker:- Mr. Peter Johnson**

Mr. Peter Johnson focused on the fundamental importance of semiconductors in powering electronic devices and systems. He emphasized their crucial role in enhancing the functionality and performance of electronic circuits, which are essential for a wide array of applications and technologies.



**Speaker:- Dr. Nilesh Desai**

Dr. Nilesh Desai presented a comprehensive update on recent developments in Dholera and Micron, discussing their significant impact on the semiconductor industry. He introduced Murphy's Law and Moore's Law, explaining their relevance to semiconductor technology and the challenges in development. Dr. Desai also highlighted the importance of simulation in semiconductor design,

emphasizing the necessity of achieving a 90% yield for technological success.

Continuing, Dr. Desai addressed the microelectronics revolution and its transformative impact

on technology. He discussed the rapidly growing \$20 crore chip market and explored how semiconductors are enabling innovations, such as converting smartphones into satellite phones. He celebrated Sunita Williams' space achievements and recent space missions, including Chandrayaan's successful landing on August 23 and the upcoming Aditya launch on September 2. Additionally, he covered upcoming solar activities from 2024 to 2025 and discussed the implications of Elon Musk's Starlink project.

Dr. Desai concluded by providing insights into the resilience of technology amidst global conflicts, such as the ongoing Russia-Ukraine war. He noted that despite such conflicts, technology, including semiconductors, continues to support essential services like the internet and television.

- **Vice-Chancellor's Speech**



**Speaker:- Dr. Rajul Gajjar**

Dr. Rajul Gajjar expressed her gratitude to all participants, speakers, and organizers for their efforts in making the FDP a success. She underscored the significance of semiconductors and provided an overview of the semiconductor manufacturing industries in Gujarat. Dr. Gajjar highlighted the advantages of the FDP, including opportunities for networking, skill development, and knowledge

enhancement.

She also discussed the current demand for expertise in Electronics and Communication (EC) and emphasized the importance of fostering a proactive mindset among students towards semiconductor technology. Dr. Gajjar stressed the need for technical institutes to strengthen their programs to meet the evolving demands of the semiconductor industry and the critical role of semiconductors in defense applications.

She concluded by highlighting the need for high-end professionals in the semiconductor industry and the importance of continuous professional development to prepare students for future challenges.

- **Vote of Thanks**





**Speaker:- Dr. J. A. Amin**

Dr. J. A. Amin delivered a heartfelt vote of thanks, expressing his appreciation to all delegates, faculty members, and participants for their contributions to the event. He summarized the key takeaways, reiterating the vital role of semiconductors in various industries and the importance of the FDP in advancing knowledge and professional growth.

- **Conclusion of the Inauguration Ceremony**



The event concluded with the national anthem, followed by a group photo to commemorate the successful completion of the FDP. This final moment captured the collective spirit and commitment of all participants toward advancing semiconductor technology.

**Overview of Workshop for :**

This workshop spanned five days, from **Monday, 02 September 2024** to **Friday, 06 September 2024**, featuring a series of technical sessions on Electronic Design Automation (EDA) tools and integrated circuit (IC) design methodologies. Each day consisted of four sessions, with industry experts presenting on various specialized topics. Below is the detailed report for each day.

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**Day 1: Monday, 02 September 2024**

- **10:30 AM to 12:00 PM**  
**Inauguration Function:** The event commenced with an inaugural function, introducing the attendees to the goals and content of the workshop.



- **Session-I: "Introduction of Synopsys EDA Tools"**  
**Speaker:** Mr. Vyom Sharma, Eigen Technologies Pvt. Ltd  
 A foundational session on Synopsys EDA tools, providing an introduction to the various tools available for digital and analog design.
- **12:00 PM to 01:30 PM**  
**Session-II: "Design and Synthesis of RTL"**  
**Speaker:** Mr. Prashanth, Eigen Technologies Pvt. Ltd  
 This session focused on Register Transfer Level (RTL) design and synthesis using Synopsys tools.
- **2:30 PM to 04:00 PM**  
**Session-III: "Formal Verification and PnR Stage using IC Compiler"**  
**Speaker:** Mr. Vyom Sharma, Eigen Technologies Pvt. Ltd  
 The session covered formal verification techniques and place-and-route (PnR) stages in IC design using Synopsys' IC Compiler tool.
- **04:15 PM to 05:45 PM**  
**Session-IV: "Schematic Design and Layout Creation & Verification"**  
**Speaker:** Mr. Prashanth, Eigen Technologies Pvt. Ltd  
 This session explained how to create and verify schematic designs and layout using EDA tools.

## Day 2: Tuesday, 03 September 2024

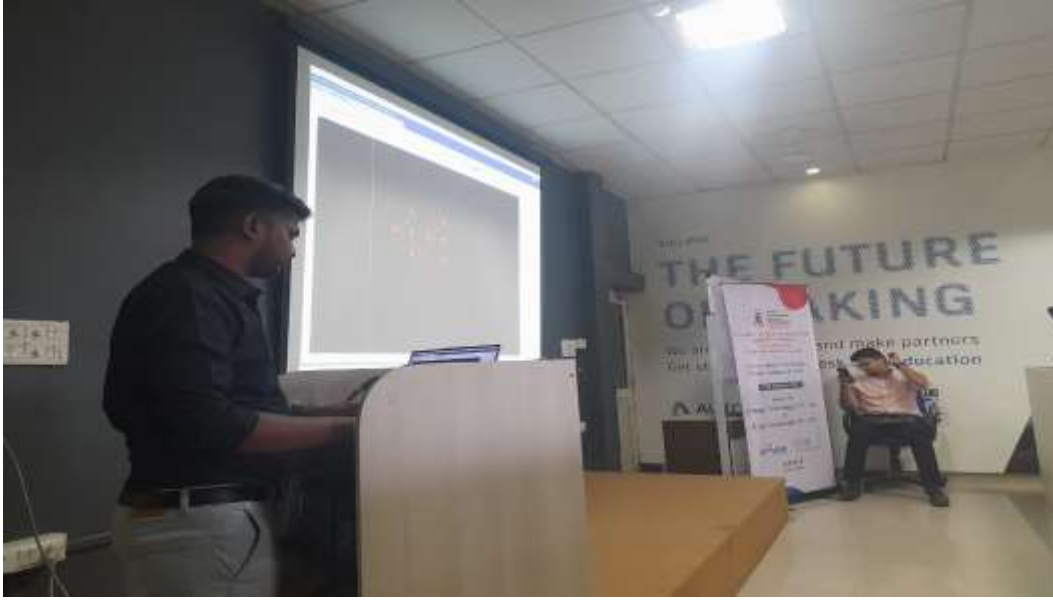
- **10:30 AM to 12:00 PM**  
**Session-I: "Introduction of Sentaurus TCAD Synopsys EDA Tools"**  
**Speaker:** Mr. Vyom Sharma, Eigen Technologies Pvt. Ltd  
 An introduction to Sentaurus TCAD for device simulation, focusing on its capabilities and application in advanced IC design.



- **12:00 PM to 01:30 PM**  
**Session-II: "Creation of Device Geometry and Explore Material Database"**  
**Speaker:** Mr. Prashanth, Eigen Technologies Pvt. Ltd  
 Participants learned about the creation of device geometry and how to explore material properties in the Synopsys environment.
- **2:30 PM to 04:00 PM**  
**Session-III: "Process Simulation using Sprocess and Electrical Characteristics using Sdevice"**  
**Speaker:** Mr. Vyom Sharma, Eigen Technologies Pvt. Ltd  
 This session provided insights into process simulation and analysis of electrical characteristics using the Sdevice tool.
- **04:15 PM to 05:45 PM**  
**Session-IV: "Simulation Management and Parameter Addition using SWP"**  
**Speaker:** Mr. Prashanth, Eigen Technologies Pvt. Ltd  
 Detailed discussions on managing simulations and adding parameters using the Synopsys Workbench Platform (SWP).

### Day 3: Wednesday, 04 September 2024

- **10:30 AM to 12:00 PM**  
**Session-I: "Cadence Solution for Custom IC Design"**  
**Speaker:** Mr. Johnson Peter, Entuple Technologies Pvt. Ltd  
 A deep dive into Cadence solutions for custom IC design, emphasizing tools for schematic capture and layout design.
- **12:00 PM to 01:30 PM**  
**Session-II: "Schematic Capture & Testbench Creation using Virtuoso Schematic Editor"**  
**Speaker:** Mr. Shivaprasad B. K, Entuple Technologies Pvt. Ltd



- This session elaborated on creating testbenches and estimating delays, power, and performing Monte Carlo analysis using Virtuoso.
- **2:30 PM to 04:00 PM**  
**Session-III: "Layout Design and Physical Verification"**  
**Speaker:** Mr. Johnson Peter, Entuple Technologies Pvt. Ltd  
 The session focused on physical design and verification techniques using industry-standard EDA tools.
- **04:15 PM to 05:45 PM**  
**Session-IV: "Parasitic Extraction using Qantas and Post Layout Simulation"**  
**Speaker:** Mr. Shivaprasad B. K, Entuple Technologies Pvt. Ltd  
 Parasitic extraction and post-layout simulations using the Quantus tool were discussed in this session.

#### Day 4: Thursday, 05 September 2024

- **10:30 AM to 12:00 PM**  
**Session-I: "IC Physical Design Flow, PD Flow, Functional Simulation using Incisive Tool"**  
**Speaker:** Mr. Johnson Peter, Entuple Technologies Pvt. Ltd  
 An overview of physical design flow and simulation using Cadence's Incisive tool, covering key IC design aspects.
- **12:00 PM to 01:30 PM**  
**Session-II: "Coverage Analysis using IMC Tool, TCL Scripting, and RTL Synthesis using Genus"**  
**Speaker:** Ms. Soma Shekhar, Entuple Technologies Pvt. Ltd  
 This session addressed coverage analysis and RTL synthesis, with a focus on IMC and Genus tools.



- **2:30 PM to 04:00 PM**  
**Session-III: "Physical Implementation using Innovus"**  
**Speaker:** Mr. Johnson Peter, Entuple Technologies Pvt. Ltd  
 Physical implementation techniques using the Innovus tool for IC layout were covered in this session.
- **04:15 PM to 05:45 PM**  
**Session-IV: "Timing Analysis, Power Analysis, and Parasitic Extraction"**  
**Speaker:** Mr. Shivaprasad B. K, Entuple Technologies Pvt. Ltd  
 Attendees learned about the key aspects of timing, power, and parasitic extraction using the Quantus and Voltus tools.

### Day 5: Friday, 06 September 2024



- **10:30 AM to 12:00 PM**  
**Session-I: "Introduction to STA"**  
**Speaker:** Mr. Shivaprasad B. K, Entuple Technologies Pvt. Ltd  
 The final day started with a session on Static Timing Analysis (STA), focusing on its critical role in IC design.
- **12:00 PM to 01:30 PM**  
**Session-II: "STA Flow using TEMPUS Tool"**  
**Speaker:** Mr. Swapnil Moon, Entuple Technologies Pvt. Ltd  
 This session demonstrated the STA flow using the Tempus tool, which is crucial for timing verification in IC design.

- **2:30** **PM** **to** **04:00** **PM**  
**Session-III: "Basic Flow using VOLTUS Tool"**  
**Speaker:** Mr. Shivaprasad B. K, Entuple Technologies Pvt. Ltd  
 Power analysis and basic flow implementation using the Voltus tool were discussed in this session.
  - **04:15** **PM** **to** **05:45** **PM**  
**Session-IV: "Power Analysis using VOLTUS Tool"**  
**Speaker:** Mr. Johnson Peter, Entuple Technologies Pvt. Ltd  
 The final technical session focused on power analysis using the Voltus tool.
  - **Valedictory** **Function**  
 The workshop concluded with a valedictory function, acknowledging the contributions of the speakers and the active participation of attendees.
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- **Overall Conclusion**

The “Semiconductor Electronics Design Automation (EDA) Tools” Faculty Development Program was a resounding success, offering valuable insights into the field of semiconductor technology and its wide-ranging applications. The event fostered a deeper understanding of the industry, emphasized the importance of continuous learning, and highlighted the critical role of semiconductors in driving technological progress. It also provided an excellent platform for networking, knowledge sharing, and professional growth, setting the stage for future innovations in the semiconductor industry. This five-day workshop provided an in-depth exploration of EDA tools and IC design flows, including RTL synthesis, verification, parasitic extraction, and timing analysis. The expert speakers from Eigen Technologies Pvt. Ltd and Entuple Technologies Pvt. Ltd provided hands-on knowledge and practical insights into industry-standard tools from Synopsys and Cadence.