MAHARAJA SURAJMAL INSTITUTE OF TECHNOLOGY

Department of Electronics and Communication Engineering

REPORT on VISIT to SEMICON INDIA 2026

Venue: Yashobhoomi (India International Convention & Expo Centre)

Date of Visit: 18 September 2026 | Time: 9:00 AM – 6:30 PM



The students of **B.Tech, Electronics and Communication Engineering** at Maharaja Surajmal Institute of Technology (MSIT), has successfully participated in the Industrial Visit to SEMICON India 2026, held at Yashobhoomi on 18 September 2026, as part of the academic curriculum.

The student has actively participated in the visit and prepared this report based on the observations and learning's gathered during the visit. The conduct and performance of the student during the visit were found to be satisfactory.

The observations, descriptions, and learnings presented in this report are based on my personal experience during the visit, supplemented by relevant technical study of the semiconductor industry.

This report has been prepared solely for academic purposes as part of the curriculum requirements and has not been copied from any other source without due acknowledgement.

Acknowledgement

We would like to express my sincere gratitude to the Department of Electronics and Communication Engineering, MSIT, for organizing this industrial visit to SEMICON India 2026, which gave me a valuable opportunity to witness the semiconductor industry up close.

We are extremely thankful to our faculty coordinator, Dr Dinesh Sheron and Mrs Prinkle Talan for guiding and accompanying us throughout the visit and for encouraging us to observe and learn actively rather than passively. We would also like to thank the organizers of SEMICON India 2026 and the various exhibiting companies for allowing students to explore their booths and understand the technologies on display. This exposure has been extremely helpful in bridging the gap between classroom theory and real industrial practice.

Introduction

The semiconductor industry forms the backbone of modern electronics, powering everything from smartphones and laptops to automobiles, medical devices, and industrial machinery. As Electronics and Communication Engineering (ECE) students, understanding how a semiconductor chip travels from raw silicon to a finished, packaged product is essential for building a strong foundation in our field.

As part of our academic curriculum, our department organized an industrial visit to SEMICON India 2026, one of the largest semiconductor and electronics manufacturing exhibitions held in the country. The event brought together global and domestic companies working across the entire semiconductor value

chain, including chip fabrication equipment, materials, design tools, packaging, testing, and advanced manufacturing technologies.

The visit was conducted on 18 September 2026, from 9:00 AM to 6:30 PM, at Yashobhoomi (India International Convention and Expo Centre), Dwarka, New Delhi. A group of students from 3rd semester of Electronics and Communication Engineering, accompanied by our faculty coordinator, attended the exhibition.

This report documents the observations, technologies, and learnings gathered during the visit, along with an explanation of the underlying semiconductor concepts relevant to our ECE curriculum.

About SEMICON India

SEMICON India is a flagship exhibition and conference series organized under the global SEMICON umbrella, which is run by SEMI (Semiconductor Equipment and Materials International), a global industry association representing the electronics manufacturing and design supply chain. SEMICON India brings together semiconductor manufacturers, equipment suppliers, material providers, chip designers, electronic system makers, government bodies, and academic institutions on a single platform.

The exhibition is aligned with India's growing push toward becoming a global semiconductor manufacturing and design hub, supported by government initiatives such as the India Semiconductor Mission (ISM). SEMICON India typically features exhibition halls dedicated to different segments of the semiconductor ecosystem, technical conferences, panel discussions, and interactive company booths showcasing the latest tools, machines, and materials used in chip manufacturing.

The event we attended was organized in two main exhibition halls — one focused on semiconductor companies (equipment makers, chipmakers, and design/technology companies), and the other on new materials, metals, polymers, gases, and other supporting industries that feed into semiconductor and electronics manufacturing.

Objectives of the Industrial Visit

The industrial visit to SEMICON India 2026 was organized with the following objectives:

- To provide students with real-world exposure to the semiconductor manufacturing and design ecosystem.
- To bridge the gap between theoretical concepts taught in ECE courses (such as VLSI, semiconductor devices, and digital electronics) and actual industrial practice.
- To familiarize students with the machinery, tools, and equipment used in chip fabrication, packaging, and testing.
- To understand the roles played by different companies across the semiconductor supply chain — from raw materials and equipment to final chip design and packaging.

- To explore career opportunities and skill requirements in the semiconductor and VLSI industry.
- To observe emerging trends such as automation, robotics, and artificial intelligence in electronics manufacturing.
- To inspire students to pursue specialization and research in semiconductor technology and VLSI design.

Exhibitions and Technologies Observed

The exhibition was spread across two halls, each focused on a different part of the semiconductor value chain.

Hall 1 – Semiconductor Companies

This hall primarily featured companies involved in chip design, fabrication equipment, and semiconductor manufacturing technology. Exhibits here typically included:

- Lithography and wafer processing equipment used to pattern circuits onto silicon wafers
- Chip design and simulation tools used in the VLSI design flow
- Finished semiconductor products, processors, and memory chips
- Automation and process control systems used inside fabrication plants (fabs)

Hall 2 – Materials, Metals, Polymers and Gases

This hall showcased the supporting supply chain that feeds into semiconductor and electronics manufacturing — the raw materials and specialty chemicals without which chip fabrication would not be possible. Exhibits here typically included:

- Ultra-pure specialty gases used in processes such as deposition and etching
- Metals and alloys used for interconnects, contacts, and packaging
- Polymers and chemicals used in photoresists, insulation, and encapsulation
- Industrial climate control and cooling systems (HVAC) essential for maintaining cleanroom conditions in fabs

Together, the two halls gave a fairly complete picture of the semiconductor ecosystem — from the raw materials and specialty chemicals at one end, to the finished, packaged chip at the other.

Wafer Fabrication

Wafer fabrication, often called the 'front-end' process, is where the actual electronic circuitry is built onto the silicon wafer. This involves repeating a set of core processes multiple times to build up the many layers of a modern chip.

Key Steps in Wafer Fabrication

- Oxidation: A thin layer of silicon dioxide is grown on the wafer surface to act as an insulator.
- Photolithography: A light-sensitive material (photoresist) is applied, and ultraviolet light is used through a patterned mask to transfer circuit patterns onto the wafer — this is one of the most critical and precise steps.
- Etching: Unwanted material is chemically or physically removed to form the patterned structures defined during lithography.
- Doping (Ion Implantation): Impurity atoms are introduced into specific regions of silicon to modify its electrical properties and create the p-type and n-type regions needed for transistors.
- Deposition: Thin films of various materials (metals, insulators, semiconductors) are deposited onto the wafer to build interconnects and device layers.
- Chemical Mechanical Planarization (CMP): The wafer surface is polished to be perfectly flat before the next layer is built, ensuring uniformity across the many layers of the chip.

A modern chip may require dozens of layers, meaning these steps are repeated many times, with extreme precision, to build the final integrated circuit. Advanced fabs today work at process nodes as small as a few nanometers, where features on the chip are only a few atoms wide.

Companies/Organizations Exhibiting at SEMICON India

A wide range of global and domestic companies exhibited at SEMICON India 2026. Some of the companies observed during the visit, along with their broad area of business, are listed below:

Company	Area of Business (General)
ASML	Global leader in photolithography systems used in chip fabrication
Tokyo Electron (TEL)	Semiconductor production equipment, including deposition and etching systems
Applied Materials	Materials engineering solutions and semiconductor fabrication equipment
Tata Electronics	Indian semiconductor manufacturing and electronics assembly
Tech Mahindra	IT, engineering, and technology solutions for the electronics and semiconductor sector
Micron Technology	Memory and storage semiconductor products (DRAM, NAND)
Daikin	Industrial climate control and cooling solutions used in fabs and cleanrooms
AMD	Semiconductor design company known for processors and computing chips





Relevance of the Visit to ECE and VLSI

This industrial visit was highly relevant to our ECE curriculum, particularly subjects such as Semiconductor Devices, Digital Electronics, VLSI Design, and Electronic Materials. Concepts that are often studied only theoretically — such as doping, photolithography, and IC fabrication — became tangible when we saw the actual machines and processes used to implement them at an industrial scale.

For students specializing or planning to specialize in VLSI design, the visit provided valuable context on



how chip designs created using software tools are eventually translated into physical silicon through fabrication and packaging. This end-to-end perspective is extremely valuable, as VLSI courses typically focus more on the design side and less on the physical manufacturing process.







Overall Learning Experience and Conclusion

The industrial visit to SEMICON India 2026 was an extremely valuable and eye-opening experience. Spending a full day at Yashobhoomi, moving between the semiconductor hall and the materials hall, gave a fairly comprehensive view of just how many industries and technologies come together to produce a single microchip.

The industrial visit to SEMICON India 2026 provided a comprehensive and practical understanding of the semiconductor industry, covering everything from raw materials and fabrication equipment to chip design, packaging, and testing. As Electronics and Communication Engineering students, this exposure has strengthened our theoretical understanding of VLSI and semiconductor devices while also giving us insight into potential career paths within this rapidly growing industry.

Overall, the visit successfully achieved its objectives of bridging academic learning with real-world industrial practice, and it is strongly recommended that such visits continue to be organized for future batches of ECE students.

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Department of ECE, MSIT. Date: 18.09.2026