



One Day industrial Visit to “**ELCIA CLUSTER**” on 7th April 2026

In association with IIC & all professional bodies



Industrial Visit Report

Venue: ELCIA CLUSTER 3P, West phase, Electronic City, Konappana Agrahara, Karnataka 560100

Date of visit: 7th April 2026

Faculty coordinators: Dr. Dinesh Kumar D S, Mr. Satish Kumar B

Faculty attended: Mr.Christo Jain, Mrs. Ramya K R, Mrs. Bhanumathi A & Mrs. Sapna Patil

Total no of Students: 120

Department of Electronics and Communication Engineering under **IETE student's forum, IEEE, ISTE and IELIIC** in association with **IIC (Industry Institute Interaction Cell)** organized one day industrial visit to **ELCIA CLUSTER, Bengaluru** on “**PCB Design, motherboard manufacturing**”

Objectives:

1. To gain practical knowledge about manufacturing processes, production systems, and industrial operations.
2. To understand the functioning of industries in the ELCIA cluster related to PCB design
3. To enhance communication skills, observation skills, and professional behavior.

About Elcia Cluster:

The **ELCIA Cluster** is a Bengaluru-based Common Facility Centre that supports the electronics manufacturing industry by providing advanced infrastructure for product development, testing, and manufacturing.

The cluster operates as a shared innovation hub where companies—especially MSMEs and startups—can access high-end facilities without investing in expensive equipment individually. It focuses on areas such as:

- PCB design and prototyping
- Motherboard manufacturing
- Electronics assembly and testing
- Precision machining and fabrication
- Product certification and quality assurance

The facility plays a key role in strengthening India's electronics manufacturing ecosystem by enabling industries to develop high-quality and reliable electronic products.

The Visit:



The industrial visit to the ELCIA Cluster, located in Bengaluru, was organized for the students of the Department of Electronics and Communication Engineering from KS Institute of Technology.

A group of students, accompanied by faculty members, visited the facility to gain practical exposure to **electronics manufacturing, motherboard production, and advanced industrial machines.**

Upon arrival, we entered a well-equipped technical environment consisting of modern machines, testing systems, and manufacturing setups. The atmosphere resembled a real industrial workspace where precision, efficiency, and quality are of utmost importance.

The session began with an introduction by the technical experts, who explained the importance of **practical skills, industry knowledge, and continuous learning** for engineering students. They emphasized how industries today require not only theoretical understanding but also hands-on experience with machines and tools.

After our arrival, we were guided into a seminar hall where the initial briefing session was conducted. The experts welcomed us and introduced the objectives of the visit. They explained how the ELCIA Cluster acts as a **bridge between academic learning and industrial application**, especially for students and startups working in the electronics domain.

The speakers emphasized that in today's competitive world, engineers must focus on three essential aspects:

- Strong theoretical knowledge
- Practical technical skills
- Problem-solving and adaptability



The Workshop Tour:

After the technical session, we were taken for a detailed tour of the facility at the ELCIA Cluster, where we were able to observe various machines and processes used in electronics manufacturing. This part of the visit helped us convert theoretical knowledge into practical understanding.

The workshop environment was well-organized and equipped with advanced machines, each dedicated to a specific stage of the manufacturing process. The instructors guided us through each section and explained the working principles of the machines in detail.

1. PCB and Motherboard Manufacturing Section

The first section we visited focused on **Printed Circuit Board (PCB) and motherboard manufacturing**.

We learned that the PCB forms the backbone of any electronic system, providing electrical connections between components. In this section:

- The design of circuits is transferred onto the PCB
- Copper layers are used to create conductive paths
- Automated machines place electronic components precisely

The instructor explained how **Surface Mount Technology (SMT)** is used to mount components directly onto the board. These machines operate at high speed and accuracy, ensuring efficient production.

We observed how even tiny components are handled with extreme precision, highlighting the importance of automation in modern electronics manufacturing.

2. Laser Machine Section

One of the most interesting sections of the workshop was the **laser machining area**.

Here, we learned how laser technology is used in various stages of manufacturing:

- **Laser cutting** is used to shape materials with high precision
- **Laser drilling** is used to create microscopic holes in PCBs
- **Laser marking** is used for labeling and identification

The instructor explained that laser machines are preferred because they provide **non-contact processing**, which reduces damage to materials and ensures high accuracy.

This section gave us a clear understanding of how advanced technologies are used to achieve precision that is not possible with manual methods

3. CNC and Precision Machining Section

Next, we were introduced to **CNC (Computer Numerical Control) machines**, which are used for manufacturing precise mechanical components.

These machines work based on programmed instructions and are capable of producing complex shapes with high accuracy. The instructor explained how CNC machines are essential in creating components that support electronic systems.

We also learned how automation in machining reduces human effort while improving consistency and quality.

4. Testing and Quality Control Section

The final section of the workshop focused on **testing and inspection**.

In this area, we observed different systems used to ensure product quality:

- **Optical Inspection Systems** to detect surface defects
- **X-ray Inspection Machines** to identify internal faults in PCBs
- Functional testing setups to verify performance

The instructor emphasized that testing is a critical stage in manufacturing, as it ensures that the final product meets industry standards and performs reliably.

Student Reflection

After the batches completeing the tour, we were asked to share our experiences and learning outcomes. One of our teammates, shared an insightful reflection -

The industrial visit to the ELCIA Cluster was a very insightful experience for me as a student. It helped me understand how the concepts we learn in class are actually used in real industries.

One thought that stayed with me throughout the visit was, “I found it really interesting how a simple circuit design can turn into a complete motherboard with the help of machines and precise processes.” This made me realize the importance of every small concept we study.

While observing the machines, I felt that, “I found it amazing how laser machines can perform such precise operations like cutting and drilling at a microscopic level.” It made me understand how important accuracy is in electronics manufacturing.

During the workshop tour, I also realized something important: “I found that all the subjects we study are actually connected, and they come together to build a complete system.” Concepts from electronics, programming, and manufacturing are not separate—they all work together in real-world applications.

Another moment of realization for me was, “I found that industries depend more on practical skills than just theoretical knowledge.” This made me think about the importance of gaining hands-on experience through projects and internships.

I also noticed the role of automation and thought, “I found it impressive how machines can do complex tasks faster and more accurately than humans.” This showed me how technology is shaping the future of engineering.

Overall, I felt that, “This visit helped me understand what it really means to be an engineer.” It motivated me to improve my technical skills and focus more on practical learning.

~Kavishree R

The visit also helped students recognize the **interconnection between different subjects**, such as electronics, programming, and manufacturing techniques. It reinforced the idea that engineering is an integrated field where multiple concepts work together to create functional systems.

Another key takeaway was the significance of **automation and advanced machinery** in improving productivity and reducing human error. Students observed how industries rely on modern tools and technologies to maintain quality and efficiency.

CONCLUSION:

The industrial visit to the ELCIA Cluster in Bengaluru was a highly informative and enriching experience for the students. It provided practical exposure to important concepts such as motherboard manufacturing, PCB design, and the use of advanced machines like laser systems and CNC equipment. The visit helped in bridging the gap between theoretical knowledge and industrial practices by allowing students to observe real-time manufacturing processes and modern technologies. It also highlighted the importance of precision, automation, and quality control in the electronics industry.

Through this experience, students gained a better understanding of how various engineering concepts are integrated to develop functional electronic systems. The interaction with industry professionals and exposure to advanced facilities further enhanced their awareness of current industry standards and expectations.

Overall, the visit was a valuable learning opportunity that motivated students to focus on practical skills, technical knowledge, and continuous learning, thereby preparing them for future careers in the field of electronics and communication engineering.



Mapping of Industrial visit with PO'S and PSO'S

Program	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1
Industrial visit	-	-	-	3	-	-	-	-	3	2	2	2

- **PO4:** Participants can identify complex problems for project work
- **PO9:** Individual & Team work
- **PO10:** Participants can communicate effectively by gaining knowledge about solar energy
- **PO11:** Project Mgmt. & Finance
- **PO12:** Participants can apply the basic knowledge in lifelong learning.
- **PSO1:** Participants are able to understand and apply communication tools to various fields of power generation and utilization using renewable sources of energy

Industrial Visit Coordinators

Dr. Dinesh Kumar D S

HOD ECE

Principal

Mr.SatishKumar D S

