

Industrial Visit Report: Nanofabrication Facility at IIT Bombay

Date of Visit: January 31, 2026

Location: Centre of Excellence in Nanoelectronics (CEN), IIT Bombay

Target Group: Third-Year Engineering Students

Duration: 1 Hour (11:00 AM – 12:00 AM)

1. Introduction

On January 31, 2026, we visited the **Nanotechnology Lab** at IIT Bombay. The goal was to see how computer chips and tiny sensors are actually made. Since nanotechnology deals with things 1,000 times smaller than a human hair, this lab is one of the most specialized places in India.



2. Entering the "Cleanroom"

Before entering, we learned about the **Cleanroom**. This is a room where the air is filtered to be incredibly pure.

- **The Gear:** We saw how researchers wear "Bunny Suits" (special white suits) to keep dust, hair, and skin from falling on the tiny chips.
- **The Dust Factor:** We were told that even one tiny speck of dust is like a giant rock to a nano-chip and can break the whole circuit.

3. Key Things We Saw

During our one-hour walk-through, we focused on three main steps:

- **The Yellow Room (Photolithography):** This part of the lab has yellow lights. Why? Because the chemicals used to "print" the circuits are sensitive to blue/white light. It works just like developing an old-fashioned photograph.
- **The Coating Area (Thin Film Deposition):** We saw machines that "spray" a very thin layer of metal or gold onto a silicon wafer. These layers are so thin you can't even see them with your eyes.
- **The Etching Area:** This is where chemicals or "plasma" are used to carve away the extra material, leaving behind the tiny wires of the circuit.



4. Summary of the Process

The visit showed us the four basic steps of making a chip:

1. **Cleaning:** Making the silicon wafer perfectly pure.
2. **Patterning:** Using light to draw the circuit design.
3. **Adding:** Putting a layer of metal or material on top.
4. **Testing:** Using big microscopes to make sure it works.

5. Conclusion

The visit was short but very exciting. It helped us understand that the technology inside our smartphones is made with extreme precision. It was inspiring to see such high-level research happening right here at IIT Bombay.

