



Objectives:

In honour of National Engineers Day, **ICT Mumbai's Tinkerers' Lab** conducted a transformative workshop called *LEAP (Learn Engineering by Activity with Products)*. Organized by MBF Tinkerers' Labs, the four-day workshop drew over **100 participants**, providing them with hands-on exposure to Embedded Systems and Programming. The initiative aimed to inspire students to think innovatively, encouraging them to engage in practical learning through activities involving **Arduino boards, sensors, and actuators**.

About MBF and LEAP:

Founded in 2019 by a group of IIT alumni, MBF is a public charity committed to transforming the Indian engineering education system. Through their Tinkerers' Labs and LEAP programs, MBF fosters an environment of creativity, experimentation, and hands-on learning. Collaborating with engineering colleges, MBF helps build world-class maker spaces and implements projectbased learning programs, providing students with the tools and skills necessary for innovation and personal development.

The LEAP initiative, established by the Maker Bhavan Foundation (MBF), aims to revolutionize engineering education in India through project-based learning. MBF collaborates with institutions like IIT Madras to create programs that emphasize learning through experimentation and product-building. Their mission is to transform the engineering education landscape, enabling students to gain practical skills, develop innovative solutions, and pursue careers in core engineering fields.

Workshop Overview:

The workshop was divided into slots over four days to accommodate students' class schedules, ensuring maximum participation. The key learning modules included:

1. Embedded Systems and Programming:

- Students were introduced to microcontrollers and Arduino boards.
- They learned basic Arduino programming and interfacing with different devices.

- The focus was on identifying real-life scenarios where automation could be implemented.

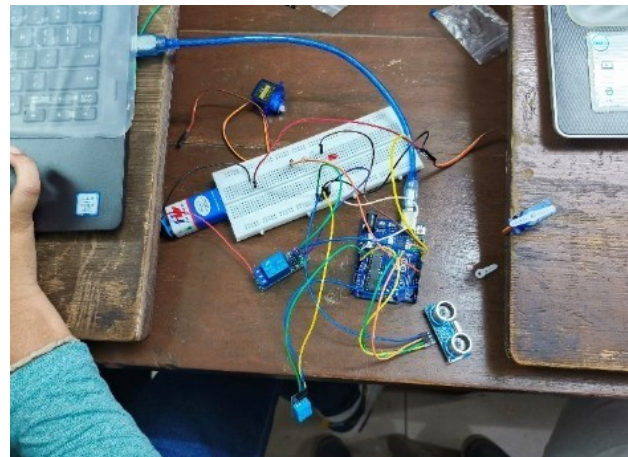
2. Sensors and Arduino:

- Participants used Arduino for data collection from various sensors and for control system tasks.
- Students explored how these sensors could be integrated with control systems to automate various tasks.

3. Building Automation Systems:

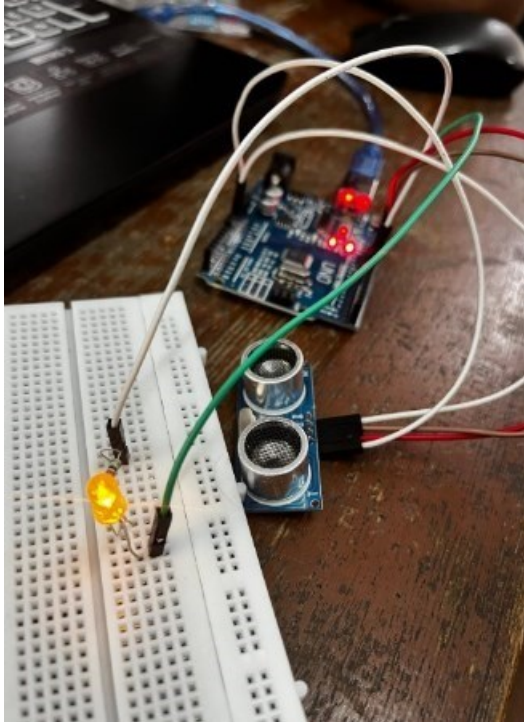
- Students engaged in hands-on projects involving control systems and automation using Arduino, such as temperature sensor-based control systems, intruder alarms, object detection systems, and light sensorbased systems.

The objective was to provide students with a fundamental understanding of these technologies, enabling them to apply the concepts in their respective streams, such as control systems, and develop innovative products using the equipment available at MBF Tinkerers' Lab.



Students' Experience:

The students thoroughly enjoyed the workshop, expressing great enthusiasm for the hands-on learning approach. It was evident that the sessions provided an opportunity for participants to overcome their apprehension towards technology, gaining confidence in programming and sensor integration. By the end of the workshop, students had built functional prototypes, further boosting their creative and problem-solving skills.



Workshop Outcomes:

The LEAP workshop proved to be a great success, fulfilling its aim to instill an innovative and entrepreneurial mindset in students. Participants acquired essential industry-specific skills and domain expertise in embedded systems and automation. Additionally, they became eligible for:

- **Internships/Placements** with core engineering companies.
- A **certificate from IITM IC** with performance-based grades, along with potential incubation funding.
- The opportunity to **compete in regional, national, and international awards**.

In conclusion, the LEAP workshop was a transformative experience for all participants, equipping them with the skills and confidence to explore, innovate, and contribute to future technological advancements. A heartfelt thank you to Dalvi Sir and the organizing team—Aarya, Karan, Rupesh, Onkar, Humera, Nirvi, Khetal, Arya, Roushan, Virendra, Shruti, Atharva, Faisal, and Sujal—whose dedication and hard work made the LEAP workshop a success. Their commitment ensured a seamless and enriching experience for all participants, leaving a lasting impact on everyone involved.

