Report on 2 Day Workshop titled

"INTRODUCTION TO SENSORS"

Duration of Workshop: 17/05/2025 and 18/05/2025

Timings of Workshop: 9.00AM to 4.00PM

Organized by: The Department of Electronics and Communication Engineering, in association with IEEE KSSEM Student Branch and Inversa Technosoft Pvt. Ltd.

Target Audience: 4th Sem students of Electronics and Communication Engineering

Scope and Objectives:

The objective of this workshop was to provide foundational knowledge and practical exposure to various types of sensors commonly used in electronics and embedded systems. The sessions introduced the students to the operating principles, characteristics, and interfacing techniques of sensors, empowering students with hands-on learning and real-time applications.

Introduction to Sensor and their application:

Sensors are devices that help electronic systems detect changes in the environment, like temperature, light, motion, or distance. They play a vital role in modern technology from smartphones to smart homes and medical equipment.

This workshop introduced students to the basics of sensor types, their working principles, and simple interfacing with microcontrollers like Arduino. Live demos and practical examples helped students understand how sensors are used in real-world applications

Workshop Structure and Methodology

The workshop spanned two whole days, from 9:00 AM to 4:00 PM each day. The sessions consisted of sessions involving theoretical explanations, demonstrations, hands-on practice, and project work.

Group Formation and Sensor Kits

- Students were divided into small groups of three.
- Each group received a comprehensive sensor kit containing a variety of sensors such as IR sensors, ultrasonic sensors, DHT11 sensor, Buzzer, LDR sensors, servo motor, and more.
- This approach enabled focused hands-on practice and encouraged teamwork.

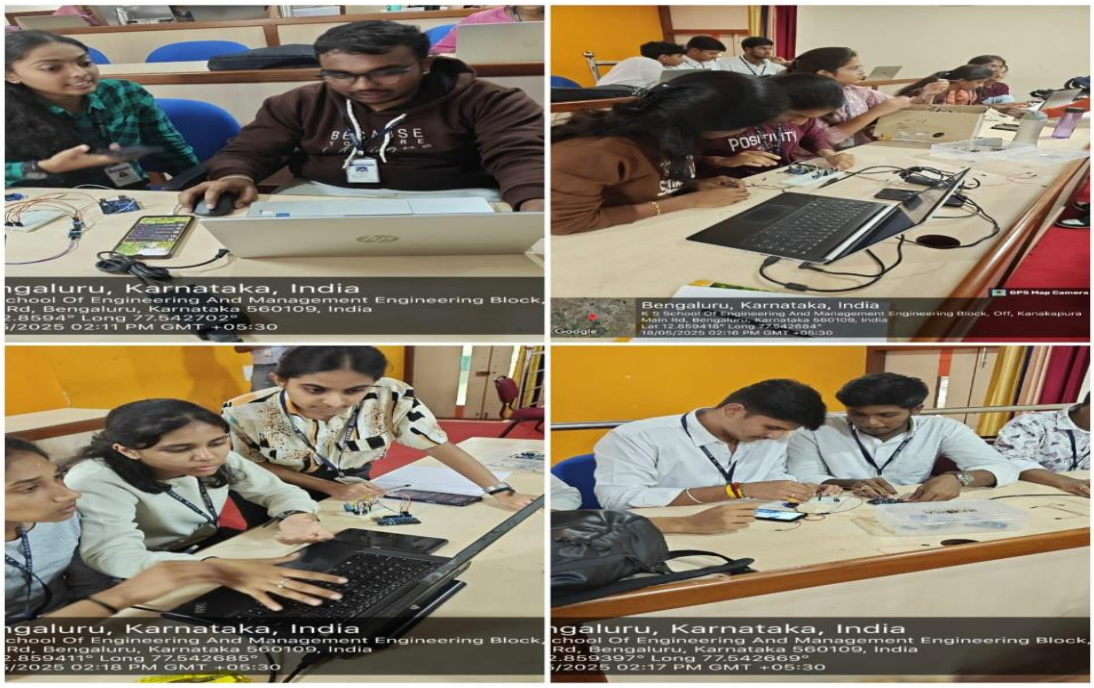

Fig. No. 1: Students program execution Screenshot.

Teaching Sessions

- The workshop began with instructor-led sessions where each sensor's working principle, circuit connections, and typical applications were explained.
- Two teachers and two student instructors led the teaching sessions, ensuring personalized attention and clarity.
- After each topic, groups engaged in hands-on practice with the provided sensor kits, applying the theoretical knowledge to practical experimentation.

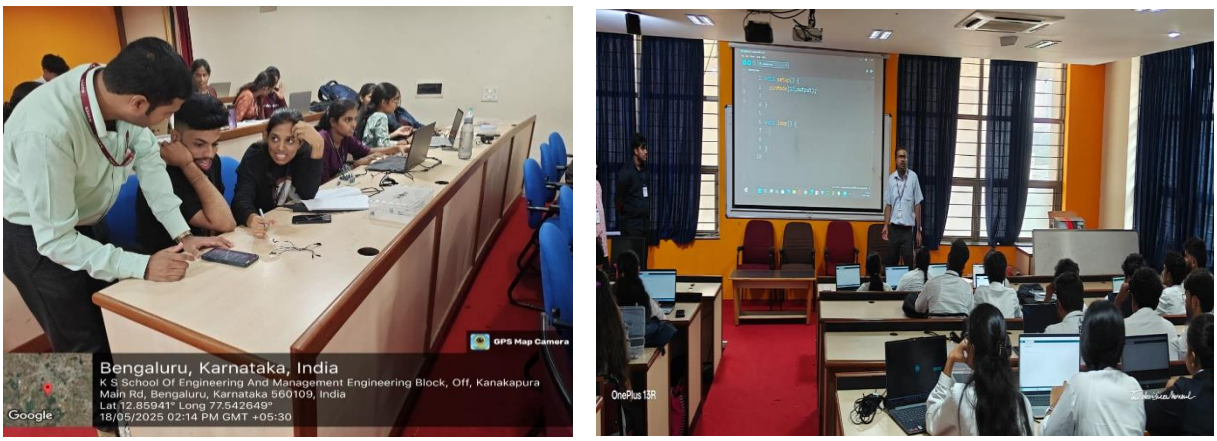

Fig. No. 2: Students interactive session with trainer.

Hands-on Sessions

- Hands-on practice was emphasized on, throughout the workshop to reinforce theoretical concepts.
- Students tested sensor responses, calibrated sensors, interfaced sensors with microcontrollers, and observed real-time data.
- The approach helped students develop confidence in sensor interfacing and debugging.

Project-Based Learning

- In the final half-day, students worked on mini-projects of their choice.
- Each project required integrating at least two different sensors to form a prototype, with a practical application in mind.
- Students designed, implemented, and demonstrated their projects, applying the knowledge gained from previous sessions.
- Projects were evaluated by facilitators based on creativity, technical correctness, and usefulness.

Support and Troubleshooting

A dedicated team of five students was available throughout the workshop to assist participants with technical difficulties, sensor malfunctions, or conceptual doubts.

- This support system ensured smooth progress and minimized delays during hands-on sessions.

- Troubleshooting guidance helped students understand common challenges in sensor interfacing, improving their practical problem-solving skills.

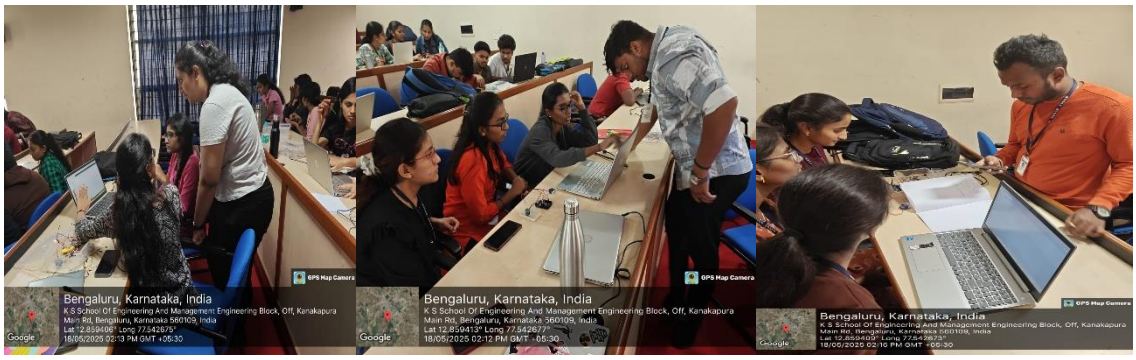

Fig. No. 3: Demonstration of student Mini Projects.

Challenges Faced

- Some students initially found it challenging to understand the wiring and interfacing of sensors with microcontrollers.
- Sensor calibration required patience and careful observation, which was new for many participants.
- Limited time for project development posed a constraint, but effective time management and facilitator support helped mitigate this issue.

Feedback from Participants

- Students appreciated the balanced mix of theory and practice.
- Hands-on sessions were highlighted as the most beneficial aspect, providing clarity and practical experience.
- The opportunity to choose their own project topics motivated creativity and deeper engagement.
- Requests were made for more time in future workshops to allow detailed project development and advanced sensor topics.

Outcomes and Impact

- Students acquired foundational knowledge regarding various sensors and their practical usage.
- The hands-on approach enhanced students' skills in sensor interfacing, troubleshooting, and project implementation.
- Collaborative group work improved communication, teamwork, and peer learning.
- The project presentations demonstrated students' ability to integrate sensors innovatively and apply their knowledge to solve real-world problems.
- Overall, the workshop successfully bridged the gap between theoretical concepts and practical application.

Conclusion and Recommendations

The two-day "Introduction to Sensors" workshop was a valuable learning experience for Electronics and Communication students. The combination of instructor-led teaching, hands-on practice, and project work ensured comprehensive learning and skill development.

For future workshops, it is recommended to:

- Extend the duration to allow deeper exploration of sensor technologies and more time for project work.
- Include sessions on sensor signal processing and integration with advanced microcontrollers or IoT platforms.
- Provide follow-up sessions or advanced workshops for interested students to further enhance their skills.

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