ROHINI
COLLEGE OF ENGINEERING & TECHNOLOGY
AN AUTONOMOUS INSTITUTION - AFFILIATED TO ANNA UNIVERSITY, CHENNAI

DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2025-2026 **YEAR/ SEM:** II / 04

SUBJECT CODE & NAME: 24ME403 & METROLOGY & MEASUREMENTS

Jigsaw Learning Process

The Jigsaw learning process is a cooperative teaching strategy where students work in small, interdependent groups to become "experts" on a specific topic and then teach it to their peers. This structured approach transforms learners from passive recipients into active facilitators of knowledge, fostering deep engagement with the material. This method promotes positive interdependence and individual accountability, ensuring that every student's contribution is essential to the group's overall success. It also enhances communication and social skills, as students must listen, discuss, and explain concepts clearly to their classmates.

The Jigsaw learning process begins by dividing students into diverse "home groups" and assigning each member a unique segment of the topic to master. Students then break away to form temporary "expert groups" with peers from other home groups who have the same segment, allowing them to deeply study, discuss, and become authorities on their assigned material. After mastering their segment, the experts return to their original home groups, where they take turns teaching their component to the rest of the team. The process concludes with synthesis and assessment, ensuring that all students have learned the complete topic through this structured peer-to-peer collaboration.

Fig. Photograph captured during Jigsaw learning process

Study materials were neatly prepared and provided to the students in advance through the online platform. During the session, students were encouraged to explore additional learning beyond the provided contents for their allotted specific topics. The students participated enthusiastically in this process. Since it is an active learning technique, the degree of students' attention toward the learning process was higher than expected. Few images captured during the Jigsaw learning process are presented in the above-figure.

ROHINI
COLLEGE OF ENGINEERING & TECHNOLOGY
AN AUTONOMOUS INSTITUTION - AFFILIATED TO ANNA UNIVERSITY, CHENNAI

DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2025-2026 **YEAR/ SEM:** II / 04

SUBJECT CODE & NAME: 24ME403 & METROLOGY & MEASUREMENTS

Flipped Classroom Activity

To actively engage students in the learning process and shift their role from passive listeners to active participants, the flipped classroom model was implemented for students from diverse engineering disciplines. This activity was conducted for Mechanical Engineering students in the course Metrology & Measurements. In this approach, the traditional lecture structure was inverted: students were provided with the study materials and topics in advance through the institution's online learning platform. They were instructed to explore the content independently before coming to class. During the next session, each student was required to deliver a seminar presentation using PowerPoint slides, summarizing their understanding of the allocated topic based on information gathered from various online resources and reference materials.

Fig. Students' presentation session during a Flipped classroom activity

The students demonstrated remarkable enthusiasm and active participation, taking ownership of their learning by preparing detailed presentations and presenting them with confidence. This method not only reinforced their understanding of the technical concepts but also enhanced their communication, presentation, and digital research skills. Photographs capturing the students' engagement during these seminar sessions are presented in the figure.

ROHINI
COLLEGE OF ENGINEERING & TECHNOLOGY
AN AUTONOMOUS INSTITUTION - AFFILIATED TO ANNA UNIVERSITY, CHENNAI

DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2025-2026 **YEAR/ SEM:** II / 04

SUBJECT CODE & NAME: 24ME403 & METROLOGY & MEASUREMENTS

Effective utilization of Smart Board for the Teaching-Learning Process

The smart classroom, equipped with touch screen facilities, serves as a powerful catalyst for enhancing student engagement and comprehension in engineering education. The interactive nature of the touch screen allows educators to move beyond static chalkboard lectures, fostering a dynamic learning environment where students feel more involved and participatory. This technology enables the seamless integration of rich multimedia content, such as animation videos that elucidate complex machine workings, step-by-step procedural demonstrations for manufacturing processes, and detailed images of intricate microstructures. By transforming abstract theoretical concepts into vivid, visual experiences, the smart classroom significantly improves knowledge retention and makes learning more intuitive and accessible for students.

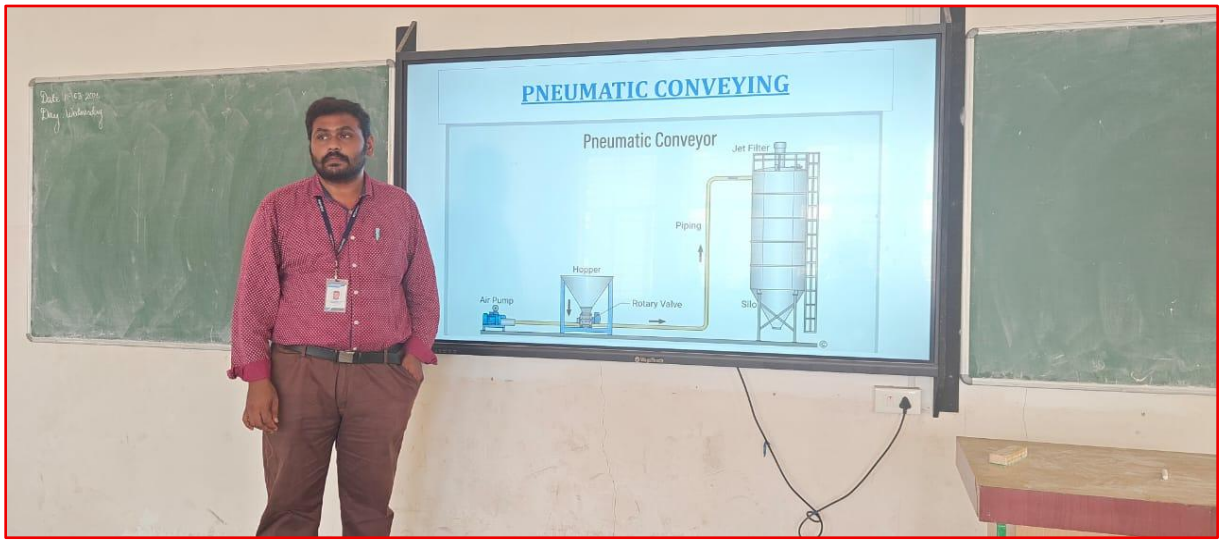

Fig. Effective utilization of the Smart Board for the teaching-learning process

Furthermore, the smart classroom extends the boundaries of traditional teaching by facilitating a wide array of advanced pedagogical activities. It provides an ideal platform for conducting virtual laboratory sessions, where students can simulate experiments and interact with digital models, thereby overcoming limitations of physical lab infrastructure. The connectivity of the smart classroom also allows for the efficient integration of online resources and the organization of online guest lectures from industry experts, exposing students to real-world perspectives. Additionally, modern assessment processes, such as instant quizzes and polls, can be practiced effectively, and students can deliver seminar presentations using the same interactive tools, thereby honing their communication and technical skills in a technologically rich setting. The image captured during a lecture hour is as presented in the above-mentioned figure.

ROHINI
COLLEGE OF ENGINEERING & TECHNOLOGY
AN AUTONOMOUS INSTITUTION - AFFILIATED TO ANNA UNIVERSITY, CHENNAI

DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2025-2026 **YEAR/ SEM:** II / 04

SUBJECT CODE & NAME: 24ME403 & METROLOGY & MEASUREMENTS

Teaching-Learning Process using YouTube Lecture Videos

To enhance the teaching-learning process, self-prepared YouTube lecture videos are being developed for both theory-oriented and problem-oriented courses. These videos are crafted in a most understandable way, featuring detailed explanations of fundamental concepts and complex topics using simple, accessible language. For problem-oriented courses, the videos adopt a step-by-step approach, guiding students through working procedures and solution methodologies in a clear, logical sequence. This structured presentation ensures that students can easily follow along and grasp the necessary analytical skills, making the learning material adaptable to different learning paces and styles.

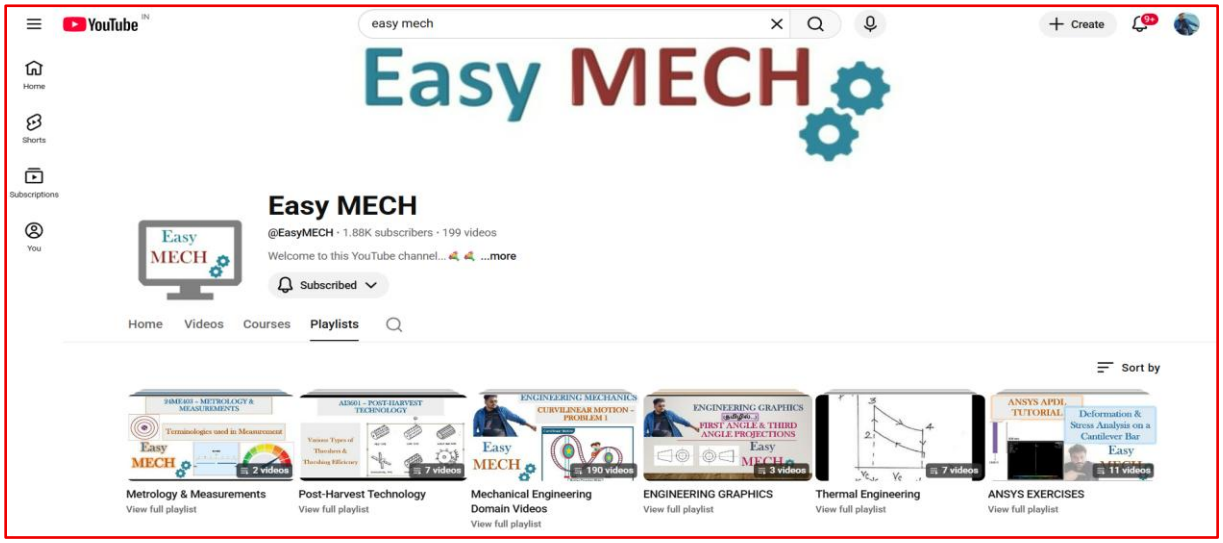

Fig. Screenshot captured on YouTube channel playlist page

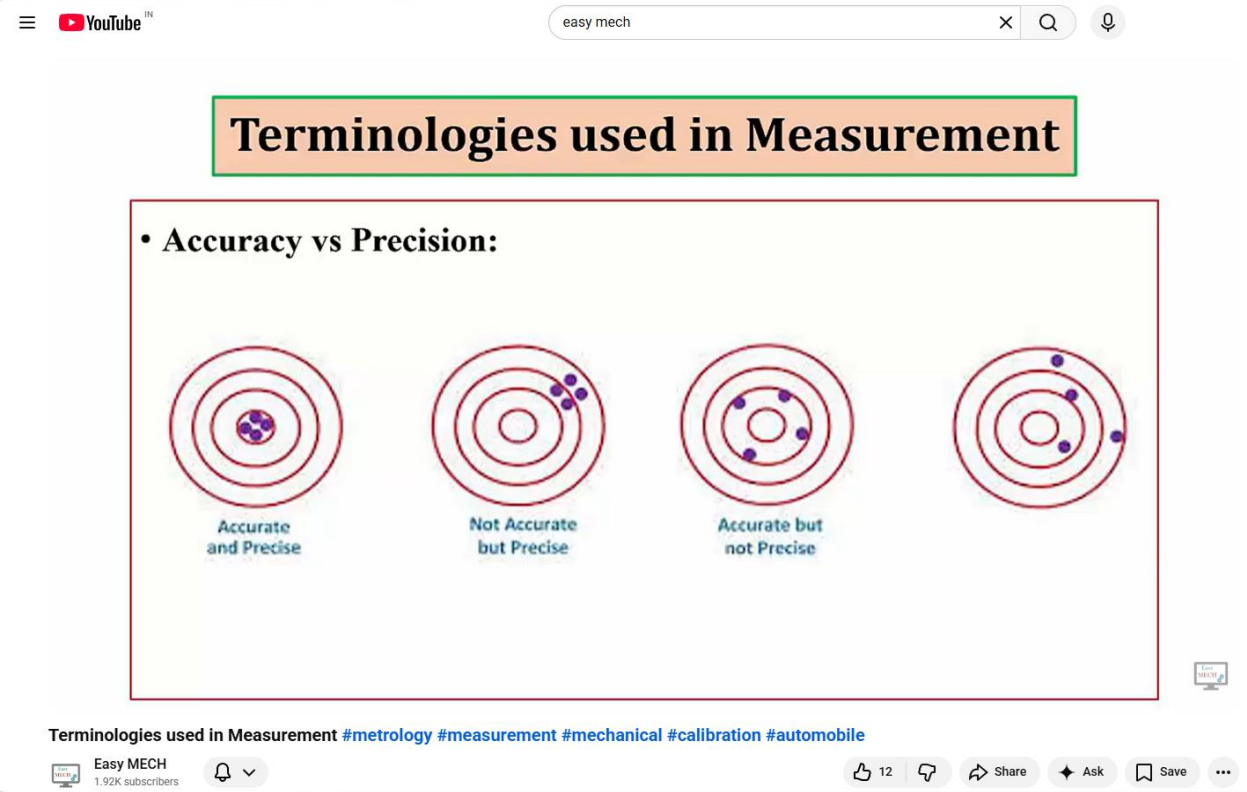

Fig. Screenshot captured while playing a YouTube lecture video

The availability of these YouTube videos has empowered students to take control of their own learning journey. They serve as a valuable resource for revising content after regular classes, preparing for internal assessments, and consolidating knowledge during end-semester examinations. Furthermore, these videos provide crucial academic support for students who are unable to attend a regular class due to unavoidable circumstances, ensuring they do not miss critical instruction. This on-demand access to quality lecture content fosters continuous learning, reduces anxiety during exam periods, and promotes a more resilient and flexible educational environment. Screenshots captured on YouTube channel playlist page and while playing a YouTube lecture video are shown in the above-presented figures for reference.