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FROM THE EDITOR-IN-CHIEF'S DESK

Welcome to the latest edition of the Mechanical Engineering Association's newsletter for the Jan-June 2025 session!

The department witnessed a dynamic blend of learning and engagement through industrial visits, group discussions, and Vocational Training. Students explored real world applications during industrial visits, gaining practical insights into manufacturing and operations. Group discussions fostered critical thinking, communication skills, and collaborative problem-solving.

Various co-curricular events added vibrance, encouraging innovation, teamwork, and leadership among students. These experiences collectively bridged the gap between theory and practice, shaping well rounded engineers ready to face industry challenges.

Get ready, it's time to relive the experience!

- Ankit Mishra

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VOCATIONAL TRAINING 2025

Date Of Event : 03rd July, 2025

Vocational Training at Godawari Power & Ispat

Mechanical engineering students gained hands-on industrial exposure during their vocational training at Godawari Power & Ispat. They observed key processes such as steel manufacturing, rolling operations, and maintenance practices. The training provided insights into real-time machinery, safety protocols, and workflow management.

Students also understood the importance of precision, teamwork, and efficiency in large-scale industries. This experience strengthened their practical knowledge, complementing classroom learning and preparing them for future engineering roles.

INDUSTRY VISITS, 2025

4th & 6th Semester

Visit to IEI Bhilai

Mechanical engineering students of 4th and 6th semester visited the Institution of Engineers (India), Bhilai, for an insightful industrial academic exposure. The visit introduced students to professional engineering practices, technical resources, and the role of IEI in promoting engineering knowledge.

Students interacted with experts, explored technical facilities, and learned about career opportunities, certifications, and continuous professional development. The visit enriched their understanding of the engineering profession beyond textbooks, inspiring them to actively engage in lifelong learning and innovation.

EV Technology & Battery Innovation

Electric vehicles (EVs) are transforming the automotive landscape, powered by rapid advancements in battery technology and intelligent systems. At the heart of every EV lies its battery, typically lithium-ion, which determines range, performance, and efficiency. Continuous innovation is pushing the boundaries with higher energy density, faster charging, and improved safety.

One of the most promising developments is the emergence of solid state batteries. Unlike conventional liquid electrolyte batteries, they offer greater stability, reduced risk of overheating, and significantly higher energy storage capacity. This could lead to EVs with longer ranges and shorter charging times, addressing two major consumer concerns.

Battery management systems (BMS) play a crucial role in optimizing performance by monitoring temperature, voltage, and state of charge. Advanced thermal management ensures batteries operate efficiently under varying conditions, enhancing lifespan and reliability.

Moreover, innovations in fast charging infrastructure are making EVs more practical for everyday use. Technologies aiming at ultrafast charging can reduce charging time from hours to minutes, bringing convenience closer to that of traditional fuel vehicles.

Sustainability is also a key focus, with research directed towards recycling batteries and developing alternative materials to reduce environmental impact. As EV technology continues to evolve, it not only supports cleaner transportation but also opens new avenues for mechanical engineers in design, manufacturing, and energy systems, shaping a smarter and greener future

-Ankit Mishra
IV Sem

Waste Heat Recovery Systems

In many industries, a significant portion of energy is lost as heat through exhaust gases, hot surfaces, and cooling systems. Waste Heat Recovery Systems (WHRS) aim to capture and reuse this otherwise wasted energy, improving overall efficiency and reducing fuel consumption.

These systems work by extracting heat from industrial processes and converting it into useful forms such as steam, electricity, or preheated air. Common technologies include heat exchangers, recuperators, regenerators, and waste heat boilers. In power plants and manufacturing units, recovered heat is often used to generate additional power or support auxiliary processes.

One advanced application is the Organic Rankine Cycle (ORC), which uses low-temperature waste heat to produce electricity. This is especially useful in industries like cement, steel, and automotive, where large amounts of heat are continuously generated.

For mechanical engineers, WHRS involve designing efficient thermal systems, selecting suitable materials, and optimizing heat transfer processes. Proper integration of these systems not only enhances plant performance but also reduces greenhouse gas emissions.

With rising energy costs and increasing focus on sustainability, waste heat recovery is becoming an essential part of modern industrial design. It transforms energy losses into valuable resources, contributing to both economic savings and environmental protection.

-Mohit Rijhwani
IV SEM.

Carbon Capture in Industries

As industries continue to expand, so do their carbon emissions, making carbon capture a critical solution in the fight against climate change. Carbon Capture, Utilization, and Storage (CCUS) technologies are designed to trap carbon dioxide (CO_2) directly from industrial sources such as power plants, cement, and steel manufacturing units before it enters the atmosphere.

The process typically involves capturing CO_2 from flue gases using chemical solvents, membranes, or adsorption techniques. Once captured, the carbon can either be stored underground in geological formations or reused in applications like enhanced oil recovery, fuel production, or even building materials.

For mechanical engineers, carbon capture systems present exciting challenges in designing efficient heat exchangers, compressors, and separation units. Optimizing energy consumption during the capture process is crucial, as it directly impacts feasibility and cost.

Recent innovations focus on reducing energy penalties and improving capture efficiency. Advanced materials and hybrid systems are being developed to make the process more economical and scalable. Industries are also integrating carbon capture with renewable energy systems to further minimize their carbon footprint.

While challenges such as high initial costs and infrastructure requirements remain, carbon capture offers a practical pathway toward sustainable industrial growth. It acts as a bridge between current fossil-fuel-dependent systems and a cleaner, low-carbon future, where engineering innovation plays a vital role in protecting the planet.

-Abhinav Chandravanshi
IV SEM.