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A Report on the
4th International 5-Day Faculty Development Programme on
"Sustainability and Research in Modern Mechanical Engineering"
Organized by
Department of Mechanical Engineering
from 09.03.2026 to 13.03.2026.

Report Submitted by: Dr. Gejendhiran S., Assistant Professor, Department of Mechanical Engineering
Mode of Conduct: Offline
Report Received on 25.03.2026.

The Department of Mechanical Engineering at Madanapalle Institute of Technology & Science (MITS) successfully organized the **4th International Faculty Development Programme (FDP)** on *"Sustainability and Research in Modern Mechanical Engineering"* from **March 09 to March 13, 2026** in online mode. The programme aimed to enrich faculty members, research scholars, and students with knowledge of emerging trends in mechanical engineering with a focus on sustainability and advanced research practices.
The FDP was coordinated by **Dr. Gejendhiran S., Assistant Professor**, with support from **Co-coordinators Dr. R. Prithivirajan, Associate Professor, and Dr. Anantha Raman L., Assistant Professor**, from the Department of Mechanical Engineering. Their dedicated efforts and systematic planning ensured the smooth conduct of the programme and active participation from attendees

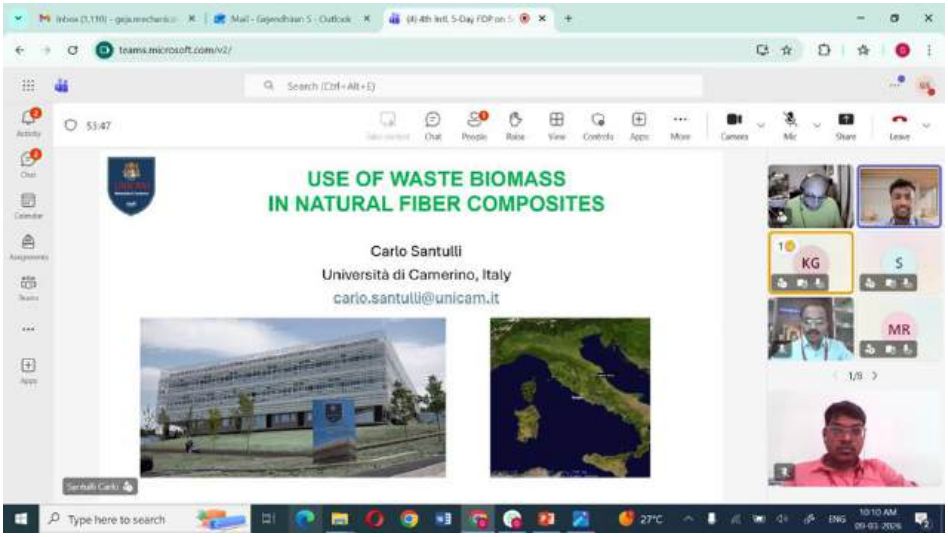
Inauguration Ceremony

The inaugural session was held on **March 09, 2026**, through an online platform. The programme was anchored by **Dr. Gejendhiran S., Assistant Professor**, who served as the Master of Ceremonies.The session commenced with a **welcome address by Dr. R. Prithivirajan, Associate Professor**, who warmly welcomed all the dignitaries, resource persons, and participants. This was followed by an **address by Dr. S. Baskaran, Head of the Department of Mechanical Engineering**, who emphasized the importance of sustainability in engineering research, interdisciplinary collaboration, and continuous learning to meet global challenges. A total of **172 participants were registered and actively participated** in the program. The inauguration concluded with a vote of thanks, acknowledging the management, organizing committee, and participants from various institutions worldwide. The inauguration concluded with an encouraging note to participants to actively engage and benefit from the technical sessions scheduled over the five days.

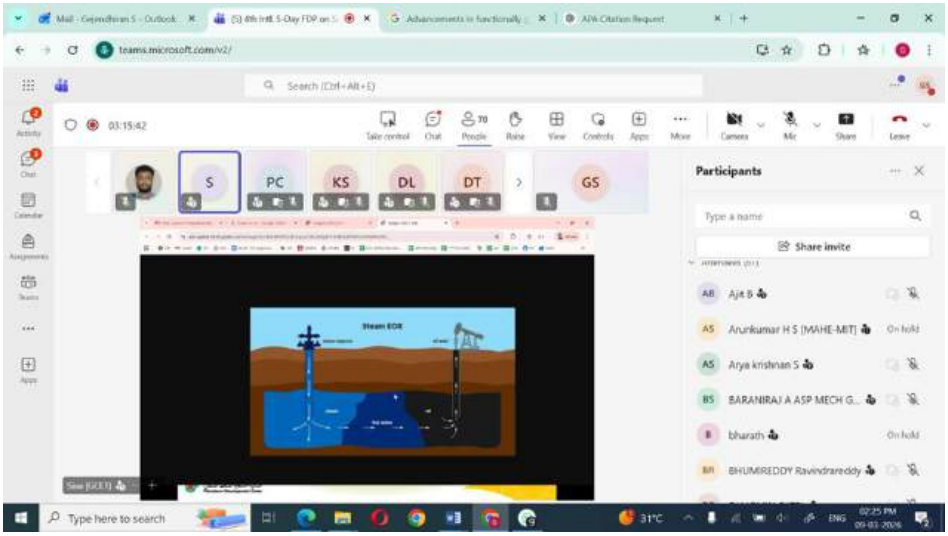
Sessions Overview

Day 1: 09.03.2026
Session I: Prof. Carlo Santulli – Università degli Studi di Camerino, Italy

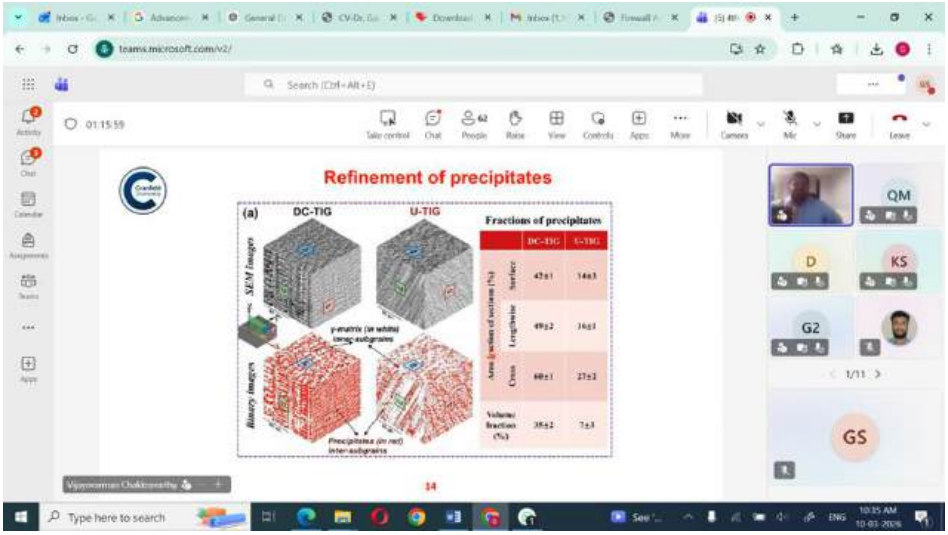
Prof. Santulli delivered a lecture on *"Use of Waste Biomass in Natural Fiber Composites."* He explained the importance of utilizing waste biomass as a sustainable reinforcement material in composite applications. The session highlighted the environmental benefits and cost-effectiveness of natural fiber composites. Various processing techniques and material properties were discussed in detail. The talk provided valuable insights into eco-friendly material development and sustainable engineering practices.



Session II: Dr. Sivasakthivel Thangavel – Global College of Engineering and Technology, Oman
Dr. Thangavel presented on *"Integration of Solar Energy Technologies into Sustainable Oil Production Operations."* He discussed the role of renewable energy in improving sustainability in the oil and gas sector. The session covered solar integration techniques and their impact on reducing carbon emissions. Real-world industrial case studies were shared for better understanding. The lecture emphasized the importance of transitioning towards cleaner energy solutions in conventional industries.

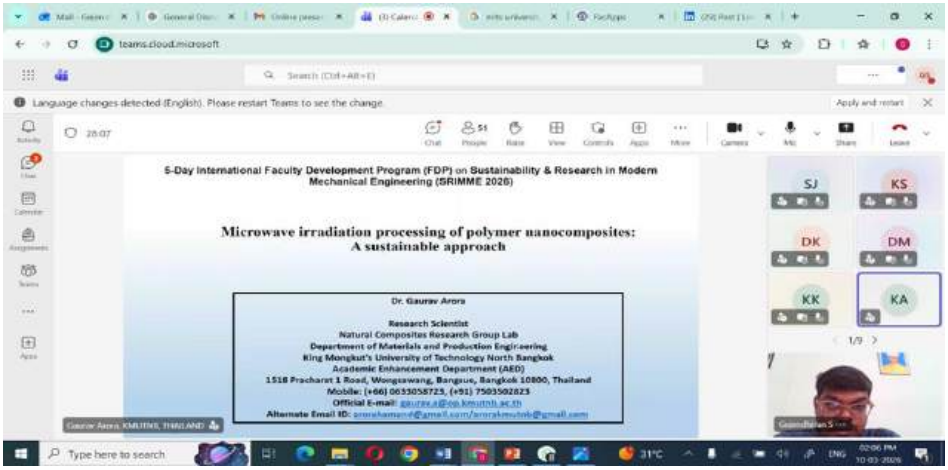


Day 2: 10.03.2026
Session I: Dr. Vijayavarman Chakkravarthy – Cranfield University, UK

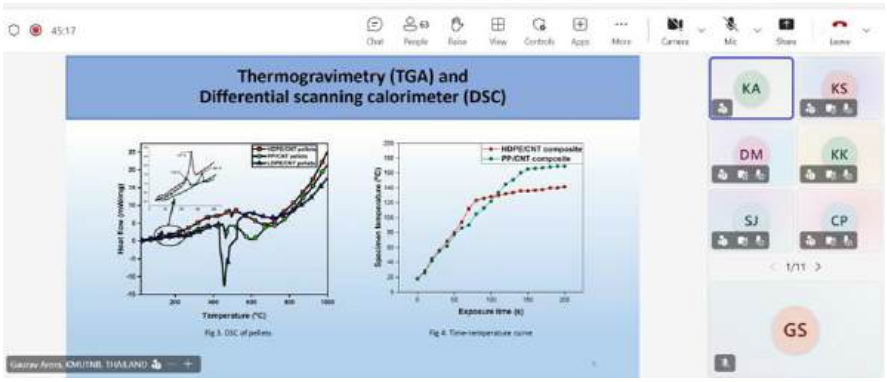


Dr. Chakkravarthy delivered a session on *"Recent Advancements in Welding of Nickel-Based Superalloys."* He explained the challenges involved in welding high-temperature materials like superalloys. The lecture covered modern welding techniques and process optimization methods. Microstructural evolution and defect control strategies were also discussed. The session provided deep insights into advanced welding technologies used in aerospace and energy sectors.

Session II: Dr. Gaurav Arora – KMUTNB, Thailand

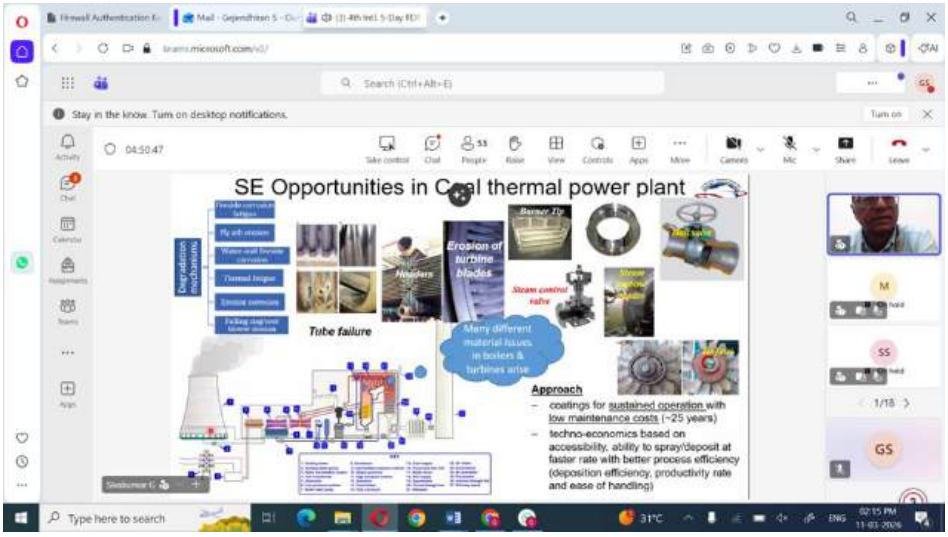


Dr. Arora presented on *"Microwave Irradiation Processing of Polymer Nanocomposites."* He explained how microwave processing enhances material properties and reduces processing time. The session focused on sustainable approaches for developing advanced polymer composites. Various applications in engineering and industry were highlighted. The talk provided a clear understanding of modern material processing techniques.

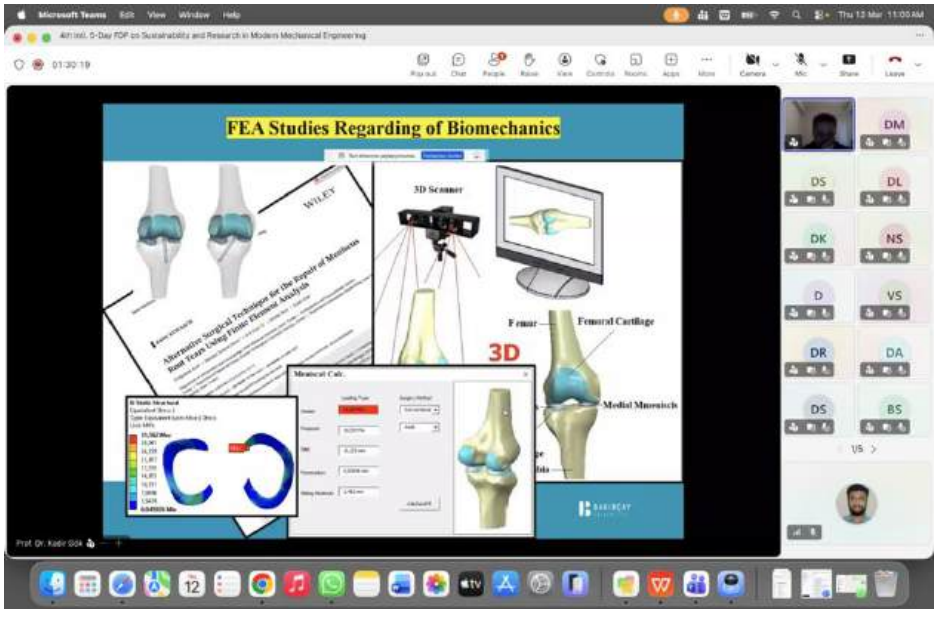


Day 3: 11.03.2026
Session I: Dr. Avinash Ravi Raja – IIITDM Jabalpur, India

Dr. Avinash delivered a lecture on *"Friction-Based Additive Surface Modification."* He explained the mechanism, process parameters, and applications of friction-based surface engineering techniques. The session focused on improving surface properties such as wear resistance and strength. Case studies and practical applications were discussed. The lecture highlighted the importance of surface modification in extending component life.



Session II: Dr. Sivakumar Govindarajan – ARCI, India
Dr. Sivakumar presented on *"Resource Conservation through Surface Engineering."* He discussed how surface engineering techniques help extend the life of components operating in high-temperature environments. The session emphasized reducing material wastage and improving efficiency. Various coating and surface modification methods were explained. The lecture highlighted sustainable approaches in materials engineering.

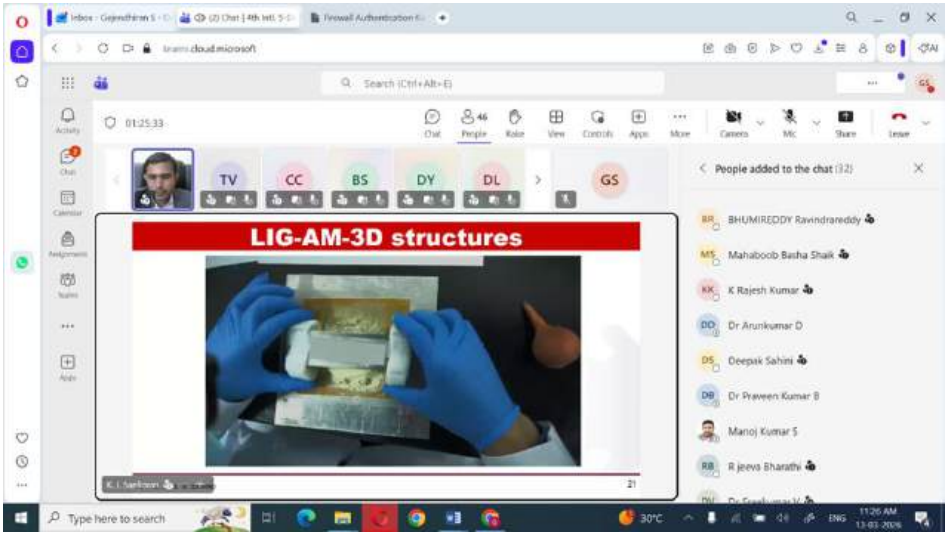


Day 4: 12.03.2026
Session I: Prof. Dr. Kadir Gok – Izmir Bakircay University, Turkey

Prof. Gok delivered a lecture on *"Finite Element Analysis Applications in Biomechanics."* He explained the use of simulation tools in analyzing biological systems and mechanical behavior. The session included case studies related to medical implants and biomechanics. The importance of FEA in design optimization and failure prediction was highlighted. The lecture provided practical knowledge of simulation techniques in engineering applications.

Session II: Dr. M. Vasudeva Reddy – Yeungnam University, South Korea

Dr. Reddy presented on *"Data Analysis, Research Tools, and Scientific Writing – Hydrogen Technologies."* He explained the importance of data analysis and modern research tools in scientific studies. The session covered best practices in technical writing and publication. He also discussed the role of hydrogen technologies in sustainable energy systems. The lecture helped participants improve their research and communication skills.



Day 5: 13.03.2026
Session I: Dr. K. J. Sankaran – CSIR-IMMT, India

Dr. Sankaran delivered a session on *"Sustainable Materials for Electronic, Energy, and Environmental Applications."* He discussed the development of advanced nanomaterials and thin films for various applications. The session highlighted the importance of sustainable materials in modern technologies. Key research areas such as sensors, coatings, and energy materials were explained. The lecture provided valuable insights into advanced material science research.

Session II: Dr. Mamilla Ravi Sankar – IIT Tirupati, India
Dr. Ravi Sankar presented on *"Sustainability in Additive Manufacturing."* He explained how additive manufacturing contributes to sustainable production and resource efficiency. The session covered material utilization, energy savings, and design optimization. Industrial applications and future trends were also discussed. The lecture emphasized the role of additive manufacturing in sustainable development.

Valedictory Ceremony

The valedictory ceremony of the 4th International FDP on "Sustainability and Research in Modern Mechanical Engineering" was held on March 13, 2026, marking the successful conclusion of the five-day event. The session was presided over by Dr. S. Baskaran, Head of the Department, who summarized the key highlights and knowledge shared throughout the program. Dr. R. Prithivirajan, Dr. Gejendhiran S and Dr. Anandaraman R, Coordinators of the FDP, expressed heartfelt gratitude to all the distinguished speakers, participants, and organizing team for their enthusiastic involvement and cooperation. Several participants shared their feedback and appreciation for the quality of sessions and international exposure they received. The event concluded with closing remarks, followed by the distribution of digital certificates to all registered participants.

Participation and Outcome

The programme witnessed enthusiastic participation from faculty members, research scholars, and students from various institutions. The sessions were interactive and encouraged active discussions, enhancing participants' understanding of advanced engineering concepts.

The FDP successfully:

- Strengthened participants' research knowledge and technical skills
- Promoted sustainable engineering practices
- Encouraged innovation and interdisciplinary research

SDG Mapping of the Programme

The **4th International 5-Day Faculty Development Programme (SRMME 2026)** was well aligned with the **United Nations Sustainable Development Goals (SDGs)**. The sessions and discussions contributed to promoting sustainability, innovation, and responsible engineering practices.

SDG 4 – Quality Education
The FDP provided high-quality learning opportunities for faculty members, research scholars, and students by delivering expert lectures from international and national speakers. It enhanced knowledge in advanced research areas and modern engineering practices.

SDG 7 – Affordable and Clean Energy
Sessions on **solar energy integration and hydrogen technologies** highlighted the importance of renewable energy sources and sustainable energy systems. The programme encouraged the adoption of clean and efficient energy solutions.

SDG 9 – Industry, Innovation, and Infrastructure
Topics such as **additive manufacturing, welding of superalloys, and advanced material processing** promoted innovation and technological advancement in engineering. The FDP supported the development of modern industrial practices.

SDG 12 – Responsible Consumption and Production
The programme emphasized the use of **waste biomass in composites, resource conservation through surface engineering, and efficient manufacturing processes**, encouraging sustainable use of materials and reduction of waste.

SDG 13 – Climate Action
By focusing on sustainable materials, renewable energy, and eco-friendly manufacturing techniques, the FDP contributed to raising awareness about climate change mitigation and sustainable engineering solutions.