



Koneru Lakshmaiah Education Foundation

(Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

❖ Recognised as Category 1 University by UGC ❖ Approved by AICTE ❖ ISO 21001:2018 Certified

Campus: Green Fields, Vaddeswaram - 522 302, Guntur District, Andhra Pradesh, INDIA.

Phone No. +91 8645 - 350 200; www.kluniversity.in

Admin Off: 29-36-38, Museum Road, Governorpet, Vijayawada - 520 002. Ph: +91 - 866 - 3500122, 2577715, 2576129

Department of Mechanical Engineering

A.Y 2025-2026, Odd Semester

Webinar Report

In view of department activities, Department of Mechanical Engineering conducted a Webinar with Dr. N. Nethaji, Head of the Department, Enpaneled Acessor, Tamil Nadu State Skill Development Corporation, Mechanical Engineering T&D, Government Polytechnic College, Palacode, Dharmapuri District, Tamil Nadu **on 26-09-2025**. He gave continuous lecture from 10:00 A.M to 11:00 A.M on the topic **“HVAC and Environmental Protection”** conducted by Energy and CFD Cohort. In on-line mode, he given presentation in Webex platform in which 89 participants (79 students and 10 faculty) of ME department were participated in blended mode in rooms M121 and M126.

Webex Link:

<https://kluniversity.webex.com/kluniversity/j.php?MTID=m9b3546db072cd90d821d9af8d0260df8>

During his interactive lecture, he discussed on:

Webinar on *HVAC and Environmental Protection*, which highlighted the importance of Heating, Ventilation, and Air Conditioning systems in modern life and their growing impact on the environment. While HVAC ensures comfort, indoor air quality, and temperature control, it also contributes significantly to global environmental challenges. Studies reveal that HVAC systems account for 40–60% of a building’s total energy consumption, and since most energy is generated from fossil fuels, this leads to high greenhouse gas emissions. The use of refrigerants further complicates the issue—CFCs and HCFCs were responsible for severe ozone depletion, while HFCs, though safer for the ozone layer, contribute heavily to global warming. Refrigerant leaks magnify these effects, making HVAC systems one of the major contributors to climate change.



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The session also traced the history and evolution of refrigeration technology. Ancient civilizations like the Egyptians, Romans, and Chinese relied on natural ice and salt mixtures to preserve food and provide cooling. The 18th century marked the development of artificial refrigeration, followed by the 19th-century invention of the vapor-compression system. By the 20th century, refrigeration and air conditioning became widely used in households, industries, and vehicles, significantly improving human comfort and lifestyles. However, the rapid adoption of synthetic refrigerants such as CFCs came at a high environmental cost. With growing awareness, today's research and industrial practices emphasize eco-friendly natural refrigerants such as carbon dioxide, ammonia, and hydrocarbons, as well as low-GWP alternatives that balance performance with sustainability.

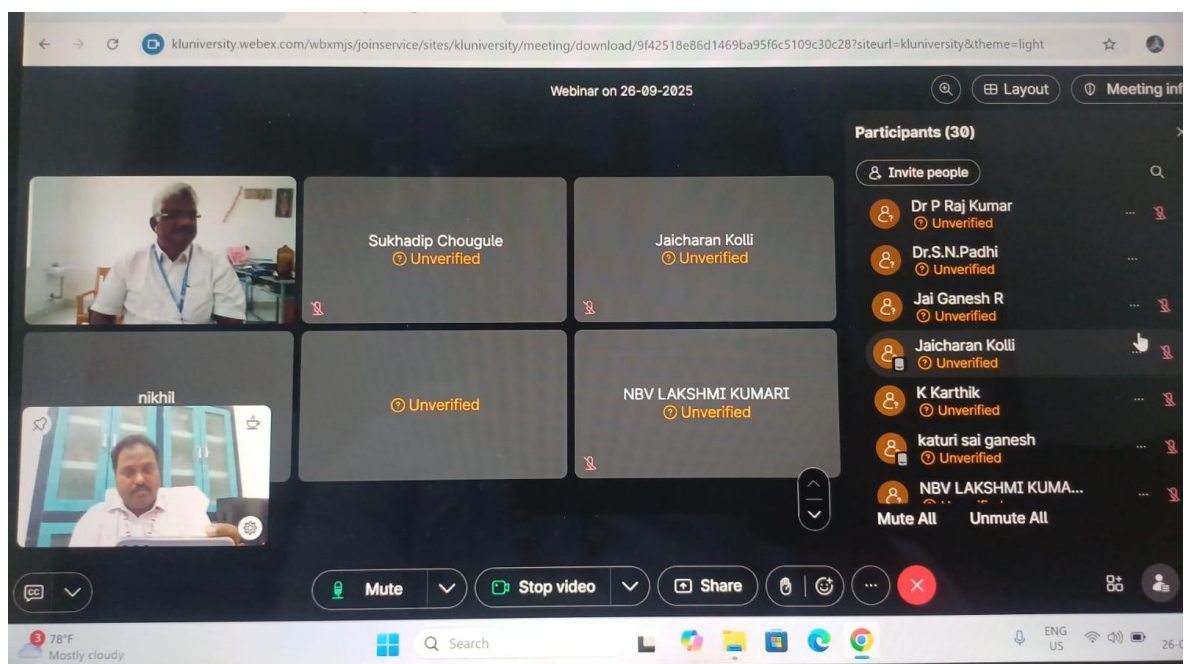
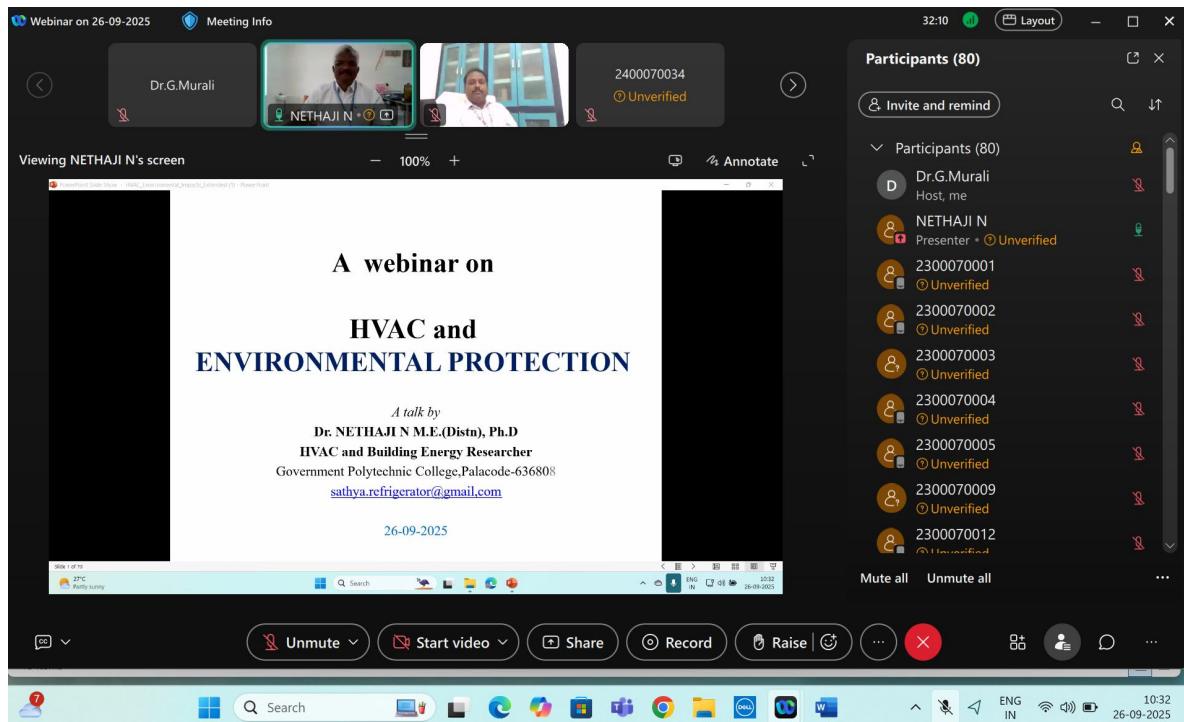
Energy efficiency emerged as a key theme in the webinar. Participants were reminded that even small lifestyle changes—such as using star-rated appliances, installing insulation, adopting smart thermostats, and setting air conditioners at 24–26°C instead of extreme low temperatures—can significantly cut energy usage. Regular maintenance, proper installation, and cleaning of HVAC systems not only reduce power consumption but also extend system life. Smart HVAC technologies powered by IoT were highlighted as future-ready solutions capable of predictive maintenance, energy monitoring, and waste reduction. Indoor air quality was also discussed in detail, as poorly maintained HVAC systems can spread mold, bacteria, and allergens that threaten health and productivity. In addition, the dangers of carbon monoxide leakage from car air conditioners were explained, stressing the importance of proper ventilation and vehicle maintenance.

At an individual level, society must embrace the 4Rs Refuse, Reduce, and Recycle while also promoting the use of public transport and eco-conscious practices at home. Industries need to adopt renewable energy sources, improve efficiency, and design long-lasting, eco-friendly products, while governments must enforce strict regulations, impose penalties for violations, and encourage sustainable development with incentives. On a global scale, agreements like the Montreal Protocol stand as successful examples of reducing ozone-depleting substances and promoting clean technologies. Looking ahead, the future of HVAC lies in carbon-neutral refrigerants, renewable energy integration, and AI-driven energy optimization. Innovations such as solar-powered cooling, absorption



refrigeration, and magnetic refrigeration are expected to redefine the industry, ensuring HVAC continues to deliver comfort while supporting global climate protection goals.

Geotagged photos of event





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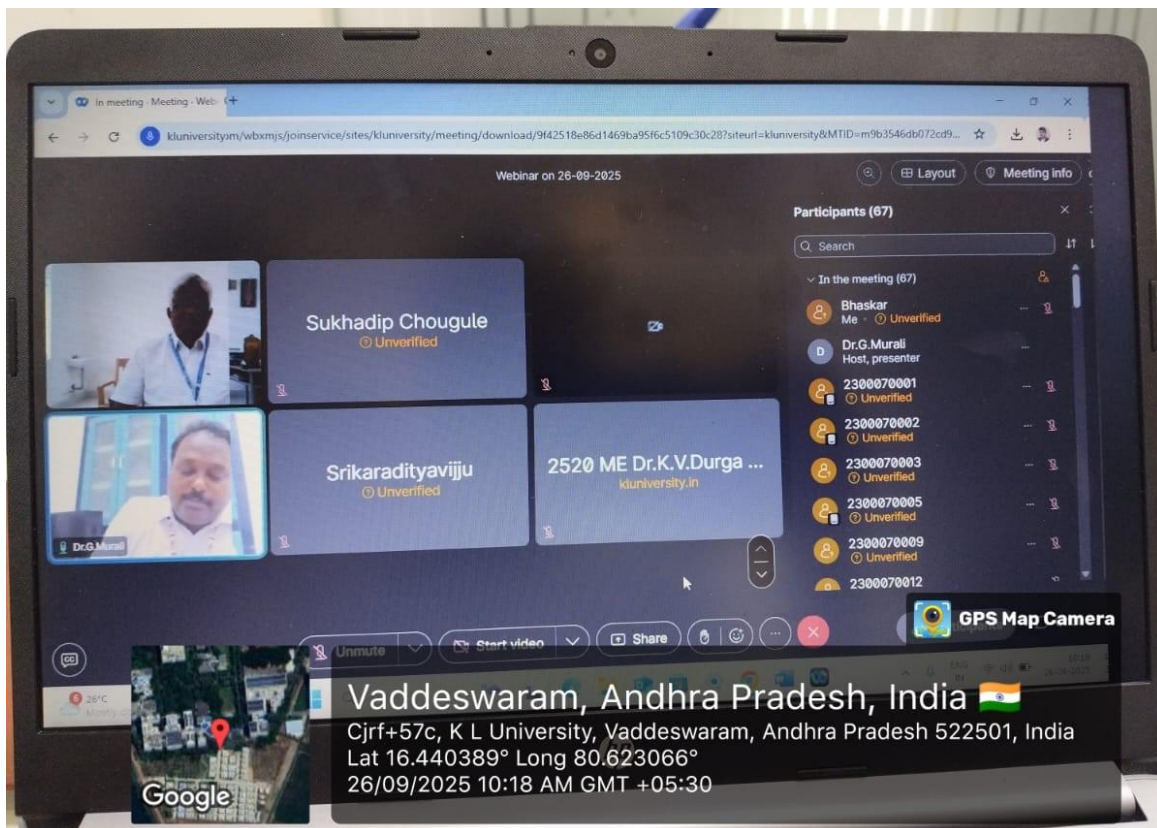
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HOD