National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Design and Development of Dual-mode (electric and solar-supported) All-in-one Turmeric (Curcuma longa L.) Processing Machine
Speaker	: Kishan Kishor Gupta (Rollno : 524fp6010)
Supervisor	: Madhuresh Dwivedi
Venue	: CH-113 Department of Food Process Engineering
Date and Time	: 19 Sep 2025 (05.00 PM)
Abstract	: Turmeric (Curcuma longa L.) is a rhizomatous herbaceous perennial of the Zingiberaceae family. It is rich in bioactive phytochemicals, particularly curcuminoids, including curcumin, demethoxycurcumin, and bisdemethoxycurcumin, and volatile oils, which provide numerous health benefits and exhibit antioxidant, anti-inflammatory, anticancer, and antibacterial activities. Despite high market demand, turmeric post-harvest handling and processing remain constrained by traditional, fragmented, and labor-intensive practices. Conventional methods require multiple independent machines and manual transfer between units, increasing labor, processing time, and spatial requirements, while causing losses from improper drying, microbial contamination, and volatile degradation. Drying, the most critical stage, is still largely dependent on sun drying, which is slow, weather-dependent, and results in substantial curcumin and oil losses. Modern microwave, infrared, and hybrid methods, though promising, are typically limited to batch operations without integration. The development of a compact, dual-mode (electric and solar-supported) all-in-one turmeric processing machine with conveyor-based hybrid dryer ensuring continuous, high-quality powder production could be a potential solution to these challenges. Furthermore, the study explores the development of turmeric-based value-added products, broadening market opportunities and consumer health benefits. By combining engineering innovation with product diversification, it aims to enhance processing efficiency, farmer income, and sustainability while strengthening India&rsquos global spice competitiveness in line with the UN Sustainable Development Goals.