National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: A Hybrid MCDM-Machine Learning Approach for Assessing Sustainable Supply Chain Readiness of Indian Manufacturing Industries
Speaker	: Prof. S.S.Mahapatra
Supervisor	: Prof. Saurav Datta (2524), PIC Departmental Seminar
Venue	: ME Seminar Hall (ME-001)
Date and Time	: 26 Sep 2025 (04:30 PM)
Abstract	: Manufacturing industries are leaning towards improving operational efficiency for long-term sustainability. In this context, the readiness of Indian manufacturing industries for sustainable supply chain management (SSCM) is investigated by considering key drivers and barriers. A hybrid approach integrating inter-valued intuitionistic fuzzy decision-making trial and evaluation laboratory (DEMATEL) combined with Random Forest Regression and Shapley Additive Explanation (SHAP) is used to determine the feature importance of the factors and their industry-wise sustainability readiness. Data have been collected from experts from seven manufacturing industries from various parts of the country. The results reveal that the most critical barriers were the limited monetary investment and the expectation of technology failure. In contrast, the drivers, environmental management certifications, and green manufacturing emerged as highly significant. The findings can guide policymakers and managers to prioritize high-impact drivers and mitigate key barriers to accelerate sustainable supply chain transitions in the Indian manufacturing sector.