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Departmental Seminar

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Seminar Title	: Return Seminar: Toward sustainable packaging: Gelatin and Chitosan-lactate-based biopolymeric films enhanced with Curcuma extract
Speaker	: Rahul Thakur
Supervisor	: Rahul Thakur
Venue	: CH-306
Date and Time	: 02 Jan 2025 (4.30PM)
Abstract	: Traditional packaging materials, derived from non-renewable sources, pose environmental challenges and often fall short in preserving food quality. Biopolymer-based films, particularly those utilizing animal byproducts like gelatin and chitosan, offer sustainable alternatives. This study focuses on developing a biopolymer film composed of gelatin, chitosan-lactate, and curcuma ethanolic extract, aiming to enhance mechanical, physical, and barrier properties for food packaging applications. The films were prepared using a solution casting method with optimized concentrations of gelatin, chitosan-lactate, and curcuma extract. Comprehensive characterization assessed rheological, mechanical, morphological, optical, barrier, antioxidant, and antimicrobial properties. Rheological analysis revealed improved elasticity and tensile strength with chitosan-lactate and curcuma extract, respectively. Morphological studies showed smooth surfaces in pure gelatin films, while chitosan-lactate incorporation caused phase separation and rougher textures. The inclusion of curcuma extract enhanced optical and water vapor barrier properties by reducing light penetration and moisture transfer. Crystallinity analysis indicated lower crystallinity in gelatin/chitosan-lactate films compared to pure gelatin, while curcuma extract increased crystallinity and altered the microstructure. Additionally, curcuma extract imparted antioxidant and antimicrobial properties, protecting against oxidative and microbial food spoilage. Gelatin/chitosan-lactate/curcuma ethanolic extract films exhibit improved mechanical strength, barrier performance, and bioactive functions, making them a sustainable alternative to conventional packaging. These films show potential for extending food shelf life while addressing the environmental impact of packaging waste, aligning with the growing demand for eco-friendly solutions.