National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Implementing an Innovative Dynamic Stiffness Method for Free Vibration Analysis of Levy Plates Under Diverse Boundary Conditions
Speaker	: Rashmita Parida (521me7001)
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Venue	: Conference Room (ME- 215)
Date and Time	: 04 Jun 2024 (10:30 AM)
Abstract	: The development of the dynamic stiffness matrix for plates is meticulously used in the present work for conducting precise free vibration analysis of Levy plates based on classical plate theory. By applying Hamiltonian mechanics, a systematic approach is used in formulating this matrix. Detailed expressions for the matrix elements are derived, and the process of assembling the matrix and applying boundary conditions is explained. The Wittrick-Williams algorithm is utilized to calculate natural frequencies, ensuring convergence to any number of frequencies with the desired accuracy. The results are validated against published data, particularly for uniform plates under various boundary conditions. Mode shapes are presented to demonstrate the accuracy and efficiency of the method. The study also examines how changes in plate parameters affect the accuracy of classical plate theory. This research not only advances the development of dynamic stiffness matrices for isotropic plates using Hamiltonian mechanics and symbolic algebra but also enhances the understanding of plate dynamics.