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| Seminar Title | : Study on Micro Grooved Water Lubricated Bearings through Numerical Simulations and Experiments |
| Speaker | : Sumit Kumar Ohdar (Rollno : 522me1004) |
| Supervisor | : Prof. Suraj Kumar Behera |
| Venue | : ME-001, Seminar Room |
| Date and Time | : 23 Oct 2024 (4:00 PM) |
| Abstract | <p>: The current study focuses on the design and numerical optimization of a water-lubricated herringbone grooved journal bearing (HGJB) for use in underwater vehicle rotors and machinery, operating at speeds of up to 3000 rpm under radial loading conditions. A numerical model was developed by solving the non-linear incompressible Reynolds equation, using the central finite difference method (CFDM) to comprehend the bearing's static characteristics of the HGJB surface. The study explores how the eccentricity ratio, speed, and groove parameters such as groove angle, depth, and number of grooves affect the bearing's performance.</p> <p>The findings show that the designed water-lubricated HGJB performs effectively under the specified operating condition, providing sufficient load capacity. Film thickness, pressure profiles, and 3750 data points were collected for various static parameters. These data were used to train an artificial neural network (ANN), successfully predicting the HGJB performance. The investigation revealed optimal values for speed, eccentricity ratio, and groove parameters, such as groove angle, groove depth, and the number of grooves, depending on the static performance requirements of the bearing. Additionally, ANFIS (Adaptive Neuro-Fuzzy Inference System) was employed to fine-tune these parameters, enhancing performance prediction and overall optimization.</p> |