National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Condition monitoring of rotating machines based on vibration energy harvesting and artificial intelligence
Speaker	: Jitendra Kumar Dixit (Rollno : 922me5002)
Supervisor	: Dr. Balaji P.S.
Venue	: Mechanical Seminar Hall
Date and Time	: 23 Sep 2024 (10.30 am)
Abstract	: Condition monitoring of rotating machinery is crucial for ensuring reliability and availability in industrial processes. As rotating machines operate at high speeds and loads, efficient condition monitoring becomes essential to extend their effective lifespan. Ineffective monitoring can lead to catastrophic failures, which in turn result in serious consequences such as production downtime, safety risks, loss of manpower, and sudden spikes in repair costs. Fault diagnosis is a key element in any condition monitoring process. It aims to detect whether a machine is in a faulty condition or operating normally, as well as to identify specific fault modes. However, traditional fault diagnosis methods face a significant limitation: they rely on an external electric supply to power the sensors. Recently, the development of triboelectric nanogenerators has offered a promising solution to this issue. These devices can convert mechanical energy into electrical energy, making them capable of transforming machine vibrations into electrical signals. The generated signals can then be analyzed to extract fault information and identify potential issues. This can be achieved through a combination of signal processing techniques and artificial intelligence (AI) algorithms. Therefore, the aim of this thesis is to develop fault diagnosis techniques for rotating machinery using triboelectric nanogenerators and AI models.