



Machinery Fault Diagnosis and Signal Processing

Mechanical Engineering

Instructor Name: Prof. A. R. Mohanty

Institute: IIT Kharagpur

Department: Mechanical Engineering

About Instructor: Professor A. R. Mohanty is a Professor and the Shyamal Ghosh and Sunanda Ghosh Chair Professor at the Mechanical Engineering Department of the Indian Institute of Technology Kharagpur with 30 years of experience in areas of noise control and machinery condition monitoring. He holds a PhD degree from the University of Kentucky, USA. He is a recipient of several awards, fellow of the Acoustical Society of India and the International Society of Engineering Asset Management. He has conducted around 100 sponsored research and industrial consultancy projects.

Pre Requisites: : BE/B. Tech in Mechanical Engineering

Core/Elective: : Elective

UG/PG: : PG

Industry Support : PSUs like SAIL, ONGC, BHEL, NALCO, EIL, RINL, BARC Private Industries like TATA STEEL, M N Dastur, Reliance

Course Intro: : The subject of machinery condition monitoring has been recently receiving considerable attention in India owing to concerns related to equipment reliability and safety. This increasing interest is primarily due to the significant impact of economic changes and strong competition in the global market. This course will provide students/engineers/managers with the state of the art techniques in machinery condition monitoring along with the recent developments in the field of signal processing, thermography, ultrasonics apart from the traditional noise and vibration monitoring. There will be demonstration of realtime machinery health monitoring by various condition monitoring aspects.

COURSE PLAN

SL.NO	Week	Module Name
1	1	Maintenance Principles, FMECA, Fault Prognosis
2	2	Vibration Analysis, Experimental Modal Analysis, Rotor Dynamics
3	3	Time domain Signal analysis, Data Acquisition, Filtering
4	4	Fourier Series, FFT, Modulation and Sidebands
5	5	Order Analysis, Orbits
6	6	Instrumentation, Data Recording
7	7	Vibration and Noise Monitoring
8	8	Rotating Machines, Bearings and Gears
9	9	Fans, Blowers, Pumps, IC Engines
10	10	Motor Current Signature Analysis, Wear Debris and Oil Analysis
11	11	NDT, Ultrasonics, EddyCurrent
12	12	Case Studies, Failure Analysis