

WORKSHOP ON  
'Dynamics, Vibration, Acoustics and Control *in Industrial Applications*'  
AT IIT(ISM)/DHANBAD

## BACKGROUND

Dynamics, vibration, acoustics, and control are at the core of any mechanical industry. Most machines have rotors as their primary components. Therefore, analysing the kinematics and gyroscopic effects in rotating systems is crucial and will be discussed and experimentally demonstrated in this course. Furthermore, in the operation of any machine, dynamic loads give rise to non-smooth operations, vibrations, noise emission, reduced machine life, and sometimes sudden breakdowns. To this end, technical manpower should be trained to compute and simulate the structural response due to dynamic loads.

Additionally, the course will focus on determining the sound radiated from machine components, which is important for assessing the machine's health and diagnosing faults. Finally, the course will discuss modern control strategies for achieving smooth operations. To summarize, the course aims to provide an easy-to-understand working knowledge of the dynamics, acoustics, and control aspects prevalent in modern industries.

## WHO SHOULD ATTEND

All application/Design/Manufacturing engineers / supervisors in Mechanical/ Mining/ Electrical/ Electronics/Maintenance Engineering.

Also, R&D/Simulation engineers who wish to build their competence in analyzing the dynamics and control aspects of mechanical systems. Further, this course is also expected to be helpful to students/faculties/researchers from academic institutions.

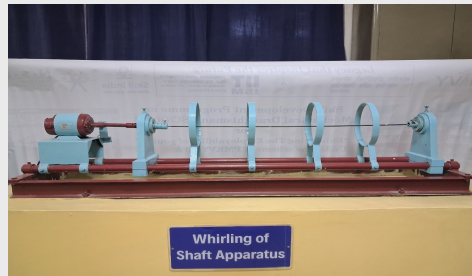
## OBJECTIVE

To provide:

- A hands-on experience of dynamics in rotating machines
- Modeling structural dynamics through symbolic coding
- An introduction to modern control strategies
- Basic insight into the sound radiation from vibrating structures
- Modern tools for measuring vibration levels and noise.

## COURSE CONTENTS

- Gyroscopic effects in rotor systems.
- Coriolis acceleration estimation in rotating systems.
- Modal Analysis of structures using symbolic computation.
- Frequency response of structures using symbolic computation.
- Whirling of Shaft experiments
- Basics of Acoustics
- Sound radiation caused by vibrating structures
- Non-Contact Vibration measurements
- Familiarization with Acoustics measurements
- Control strategies in Two-Tank System
- PID control of twin Rotor MIMO System (TRMS)
- Magnetic Levitation plant (MAGLEV)



## METHODOLOGY

The experienced faculty members of the Department of Mechanical Engg., IIT(ISM), Dhanbad will be delivering lectures in these topics. The experts from industries/Research Lab may also be hired. The practical classes will be built on fundamentals and will be conducted in the respective research laboratories of the Department live. It is recommended to participate in offline mode.

## DURATION

4 days, offline mode, starting from 22<sup>nd</sup> May 2025 to 25<sup>th</sup> May 2025

## COURSE CO-ORDINATORS AND CONTACT DETAILS

All nominations and queries should be addressed to:

### **Prof. AMAN KUMAR (Coordinator)**

Dept. of Mechanical Engg.  
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### **Prof. RABINDRA NATH HOTA (Co-Coordinator)**

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### **Prof. SANJOY K. GHOSHAL (Co- Coordinator)**

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After payment, register using the following link: (PLEASE NOTE the UTR number of the transaction)

<https://forms.gle/1Uk2ypJTJ2ic43fk9>

## COURSE FEE PER PARTICIPANT

Rs. 25,000/- (+18% GST) Industry Professionals

Rs. 15,000/- (+18% GST) Faculties

Rs. 6,000/- (+18% GST) – Students (Outside IIT (ISM))

Rs. 3,500/- (+18% GST) - Students (of IIT (ISM))

The fee includes Course certificate, Course Materials, Fooding and Lodging inside the campus for 04 days\*.

### Note:

1) Industry Professionals and Faculties will be provided accommodation inside the campus Guest House. Students outside IIT (ISM) will be provided accommodation inside the hostels.

2) \*Lodging will be provided till 3 days only as the workshop ends on the 4<sup>th</sup> day after Lunch. On the 4<sup>th</sup> day only breakfast and Lunch will be provided. Participants should plan their return on 25<sup>th</sup> evening.

## REGISTRATION

Candidates should enroll latest by 20<sup>th</sup> April, 2025 by sending the fee through the

\*net banking transaction:

Account Number : 0986101024892

Bank Name : Canara Bank

Branch : Saraidhela, Dhanbad

IFSC Code : CNRB0000986

MICR Code : 826015003

GSTIN : 20AAAAI0686DIZA

PAN : AAAAI0686D

LEGAL NAME : INDIAN SCHOOL OF MINES

SERVICE TAX REG. NO.: AAAAI0686DST001

For \*UPI transaction, kindly use the QR code below:



Note: After the successful transaction please fill in the details and upload the transaction slip in the link <https://forms.gle/1Uk2ypJTJ2ic43fk9>

\*(please note the UTR number of the transaction)

## OTHER DETAILS

IIT(ISM) is an educational institution. It has Executive Development Center (EDC) where following facilities are available:

Double seated A/C furnished room, with television, computer with Internet facilities, indoor and outdoor games.

It has A/C class rooms with LCD projectors for power point presentation

## INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES)

DEPARTMENT OF MECHANICAL ENGINEERING

*Announces*

FOUR DAY WORKSHOP

ON

Dynamics, Vibration, Acoustics, and  
Control in Industrial Applications

(STARTING 22<sup>ND</sup> MAY 2025)

AT

INDIAN INSTITUTE OF TECHNOLOGY  
(INDIAN SCHOOL OF MINES) – DHANBAD



AS A PART OF CENTENARY CELEBRATION