

A Short Term Course (Under NEP-2020)
On
“Applications of Vibration and Heat Transfer in Mechanical Engineering”

October 27–31, 2021



ORGANIZING TEAM

Patron

Professor (Dr.) Goutam Sutradhar
Director, National Institute of Technology, Manipur

Chairman

Professor (Dr.) Rajesh Kumar Bhushan
Dean (A/A) & Professor, Department of Mechanical Engineering
National Institute of Technology, Manipur

Secretary

Dr. Huirem Neeranjana Singh
Head & Assistant Professor, Department of Mechanical Engineering
National Institute of Technology, Manipur

Convener

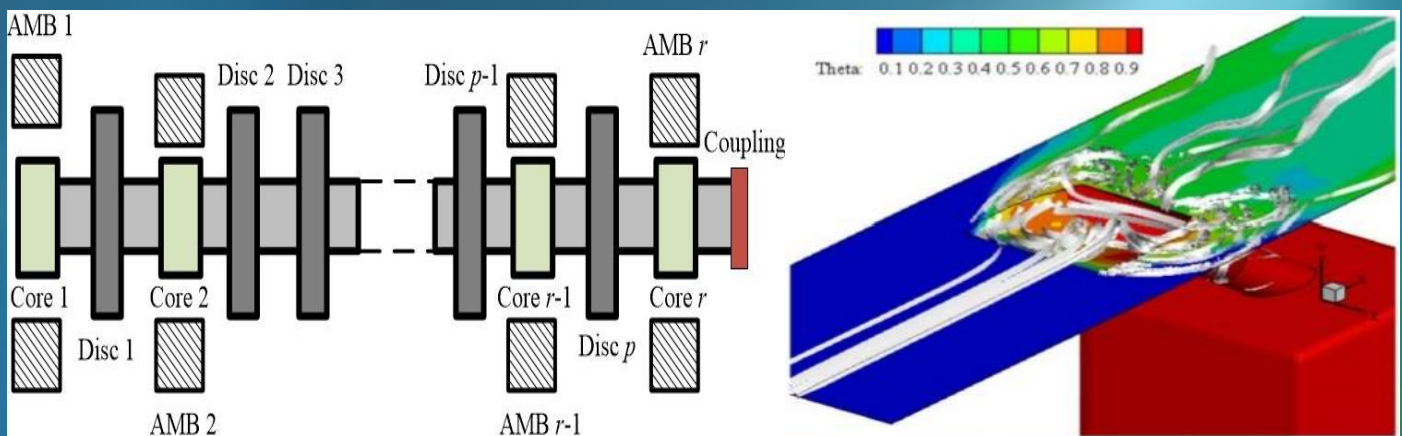
Dr. Dushyant Singh
Assistant Professor, Department of Mechanical Engineering
National Institute of Technology, Manipur

Coordinator

Dr. Prabhat Kumar
Trainee Teacher, Department of Mechanical Engineering
National Institute of Technology, Manipur

Coordinator

Mr. Ashutosh Kumar Singh
Trainee Teacher, Department of Mechanical Engineering
National Institute of Technology, Manipur



**Department of Mechanical Engineering
National Institute of Technology Manipur
Imphal West, Manipur, India- 795004**

Applications of Vibration and Heat Transfer in Mechanical Engineering

ABOUT NIT, MANIPUR

National Institute of Technology Manipur, a centrally funded institution is set up to impart quality technical education at various levels of higher learning. It is one of the ten new NITs established and developed as “**Institute of National Importance**” by an act of Parliament in 2007. NIT Manipur started its first session with the three branches of Engineering-Electrical & Electronics Engineering, Electronics & Communication Engineering and Computer Science Engineering. The functioning of the institute was started at its temporary campus at Takyelpat, Imphal under the mentorship of NIT Agartala. As one of the National Institutes of Technology (NIT), the Institute has the responsibility of providing high quality education in Engineering, Technology and Sciences to produce competent technical and scientific manpower for the country. The Institute offers B Tech, M Tech, M Sc, and PhD programmers in several disciplines of Engineering, Technology and Sciences.

ABOUT THE COURSE

Vibration and Heat Transfer concepts provide unique opportunities to study vibration principles, fluid flow, etc. in a way that goes beyond the textbook to provide real-world applications. It imparts procedures to augment to your practical knowledge of machines and plays an important role in many aspects of fundamental research and engineering applications, for example, mechanism of turbulent flow, vibration analysis of beams, optimization of processes, and online control of manufacturing. This course would explore the fundamental vibration principles and laws of heat transfer and to explore the implications of these principles for system behavior; to develop the problem-solving skills essential to good engineering practice of vibration and heat transfer in industrial applications.

Topics to be Covered

The short-term course aims to include following themes with particular emphasis to Mechanical Engineering, Civil Engineering, Chemical Engineering, Aerospace Engineering, Oceanography, Meteorology, Marine and Naval Engineering:

1. Basics of Machinery Vibration, Application of Vibration: Cymatic, Application of Active Magnetic Bearing for Vibration Control.
2. Fundamentals of Thermodynamics and Heat Transfer for Industrial applications.
3. Heat Transfer in Casting Process, Vibration Analysis of Composite Materials.
4. Fundamentals of Industrial Fluid Flow Problems.
5. Solving Vibration Problems using MATLAB.

OBJECTIVES OF THE COURSE

1. The main objective of this workshop is to provide a unique platform to facilitate Class X-XII, UG, PG, PhD students as well as the academicians and professionals and familiarize the fundamentals of Vibration and Heat Transfers for Industrial applications.
2. To help you become familiar with Vibration analysis of Composite materials.
3. To understand the concept of mathematical modelling in solving mechanical vibration problems.

Who can attend this workshop through Online?

Students: (Class X-XII, UG, PG, PhD)

Faculty of Engineering/Sciences: (Any Branch)

Other Professionals: Engineers & Scientists from Industry and R&D organizations

Registration: Kindly register through this link: <https://forms.gle/EBEeJUbL1q1yfjeFA>

Registration fee for attending this workshop.

Participant Fee: Rs 100/- only.

All Participants will be provided Certificates.

Details of the Bank Account:

Name: Director NIT Manipur IRG

Acc. No. 60330100000143

Bank and Branch: Bank of Baroda, NIT Manipur Campus

IFSC code: BARB0NITMAN

Number of participants are limited to 200. Shortlisted candidates will be informed through email.

For any query, you can contact to the course Coordinators

Dr. Prabhat Kumar/ Mr. Ashutosh Kumar Singh (ME)

Email: cfdnitm@gmail.com ; Mb: +91 8340453682, 8789109835

IMPORTANT DATES

Last Date of Registration

October 26, 2021

Resource Persons Biography

Prof. (Dr.) Goutam Sutradhar is presently serving as Director at NIT Manipur. He passed Bachelor in Mechanical Engineering from Jalpaiguri Government Engineering College in 1984 and subsequently he did his Master's Degree in Mechanical Engineering (Specialization in Foundry Technology) from IIT Kharagpur 1986 and PhD in Engineering from Birla Institute of Technology (BIT) Mesra, Ranchi. After Five years of Industrial Experience in Hindustan Motors Limited and Indian Railways he joined as Faculty Member in National Institute of Foundry & Forge Technology, Ranchi in 1991. After that he had served Serampore Textile College and Kalyani Government Engineering College about 10 years and finally he had joined as Professor, Department of Mechanical Engineering of Jadavpur University Kolkata in 2005. He has more than 100 research articles in reputed International Journals and Conference and book chapters. He has supervised more than 20 Doctoral project. He is the member of various professional organizations such as Institution of Engineers, Institute of Indian Foundrymen, etc. He has completed more than 10 sponsored and consultancy projects.



Prof. (Dr.) Rajesh Kumar Bhushan is currently serving as Professor and Dean (A/A) in National Institute of Technology Manipur, India. He has published 40 research papers in reputed international journals, 43 research papers in international conferences and national conferences. He has 24 years of experience in teaching, research and administration. He has completed 01 sponsored research project and 02 sponsored research project are under process. He is member of various international technical committee. He is PhD thesis examiner. He is certified energy manager and auditor by bureau of energy efficiency, ministry of power government of India. He is reviewer of 32 reputed international journals. He has guided 03 PhD and 35 M Tech students so far. He has delivered 20 invited lectures at national/ international conference/workshop. His research interests are Design of Bio-enabled structures, High Performance Computational Modelling of Engineered Systems, Multi-disciplinary Design Optimization, Cybersecurity in design and manufacturing, Additive manufacturing of complex and composite materials.

Dr. Dushyant Singh is currently an Assistant Professor in the Department of Mechanical Engineering at National Institute of Technology Manipur (NIT Manipur). He received his PhD from Indian Institute of Technology Delhi (IIT Delhi) and before joining his NIT Manipur, he was a Post-Doctoral Researcher in joint industrial research work with BHEL industry. His current research is collaborative and directly practical engineering applications in industries. He has 35 research articles in reputed International Journals and Conference and published 2 book chapters. He has supervised more than 02 Doctoral and 10 Masters project. He has research interests in the area of CFD, Experimental and Numerical analysis of Fluid Flow and Heat Transfer Enhancement, Multiphase Flows.



Applications of Vibration and Heat Transfer in Mechanical Engineering



Dr. Saurabh Kango is presently working as an Assistant Professor in the Department of Mechanical Engineering at National Institute of Technology Jalandhar. He received his Bachelor's degree from HPU Shimla (IET Baddi) and Master's in Computational Fluid Dynamics & Heat Transfer and PhD degree in the field of Tribology from NIT Hamirpur. He has 18 research articles in reputed International Journals and 19 international conference publications and published 4 book chapters. His current h-index is 07 and Google citations are 327. He has research interests in the area of CFD analysis of different tribological systems by using the concept of micro surface texturing/grooving & non-Newtonian rheologies of lubricants, Tribological study of treated surfaces and fabrication of hydrophobic & superhydrophobic surfaces. He is the reviewer of 8 reputed international journals. He is supervising 02 PhD and guided 3 M Tech students so far. He is a member of various international technical committees. He has taken various administration responsibilities at NIT Jalandhar.

Dr. Saurav Suman is recently working as a Trainee Teacher in the Department of Mechanical Engineering, National Institute of Technology Mizoram, India. He received his Master's degree in 2016 and PhD in September, 2021 from IIT Guwahati. He has research interests in the area of Design and Manufacturing. He has more than 18 reputed SCI and Scopus journal/conference/book chapter publications. He has also filed 2 Patents. He has guided more than 16 number of B. Tech. students so far and supervising 2 M. Tech. student. He has been Lab-In charge of Strength of Material, Dynamics of Machine and Manufacturing labs and administrative responsibilities such as Faculty In charge of Sports and Warden at NIT Mizoram.



Dr. Prabhat Kumar is recently working as a Trainee Teacher in the Department of Mechanical Engineering, National Institute of Technology Manipur, India. He received his Bachelor's degree in Mechanical Engineering from NIT Jamshedpur and selected by MHRD, NIT-IIT Trainee Teacher Scheme in 2014. Subsequently, he did Master's degree in 2016 and PhD in June, 2021 from IIT Guwahati. He has more than 13 reputed SCI and Scopus journal/conference/book chapter publications. He has research interests in the area of Vibration, Rotor Dynamics, Faults identification and Applications of Active Magnetic Bearings in Rotor System. He has guided more than 15 number of B. Tech. students so far and supervising 1 M. Tech. student. He has been B. Tech project coordinator and Lab In charge of various labs. He has also served as Assistant Warden at NIT Manipur.

Mr. Ashutosh Kumar Singh is currently working as a Trainee Teacher in the Department of Mechanical Engineering, National Institute of Technology Manipur, India. He received his Bachelor's degree in Mechanical Engineering with Gold Medal from GZS PTU Campus Bathinda Punjab and selected by MHRD, NIT-IIT Trainee Teacher Scheme in 2016. Subsequently, he did Master's degree from IIT Guwahati in 2018 and presently pursuing PhD from IIT Guwahati. He has more than 5 reputed journal/conference/book chapter publications. He has research interests in the area of CFD, Experimental and Numerical study of Film Cooling and Turbulent Flows. He has guided more than 3 number of B. Tech. students so far and 6 M. Tech. students. He has been M. Tech project coordinator and Lab In charge of various labs.



Session Plan

A Short Term Course (Under NEP-2020)

on

“Applications of Vibration and Heat Transfer in Mechanical Engineering (AVHTME-2021)”

October 27–31, 2021

Organizing by: Department of Mechanical Engineering, NIT Manipur

Date-Day	Forenoon Session (10:30 AM-12:00 AM)	Afternoon Session (2:30 PM-4:00 PM)
27/10/2021 Wednesday	Session 1 Inaugural Session	Session 2 Heat Transfer in Casting and Material Processing Prof. (Dr.) Goutam Sutradhar Director, NIT Manipur
28/10/2021 Thursday	Session 3 Vibration Analysis of Composite Materials Prof. (Dr.) Rajesh Kumar Bhushan NIT Manipur	Session 4 Basic Concepts of Thermodynamics and Heat Transfer for Industrial Applications Dr. Dushyant Singh NIT Manipur
29/10/2021 Friday	Session 5 Design and Applications of Active Magnetic Bearings for Vibration Control Dr. Prabhat Kumar NIT Manipur	Session 6 Fundamentals of Machinery Vibrations Dr. Saurav Suman NIT Mizoram
30/10/2021 Saturday	Session 7 Application of Vibration: Cymatic Dr. Saurabh Kango NIT Jalandhar	Session 8 Fundamentals of Industrial Fluid Flow Problems Mr. Ashutosh Kumar Singh NIT Manipur
31/10/2021 Sunday	Session 9 Solving Vibration Problems using MATLAB Dr. Prabhat Kumar NIT Manipur	Session 10 Vibration and Heat Transfer Applications based Question-Answer Session/Valedictory