

Faculty Development Programme

# Low Frequency NVH & Automotive Applications using Abaqus & NVH Learning Lab

**October 6–10, 2025**

*in collaboration with*



Department of Mechanical Engineering  
Thapar Institute of Engineering & Technology

## FDP Purpose: Building NVH Expertise

Step into the world of Noise, Vibration, and Harshness (NVH) with an immersive five-day learning experience. Hosted by Thapar Institute Patiala, the nodal center, this program is designed for educators, researchers, and industry professionals eager to explore NVH fundamentals, cutting-edge tools, and real-world applications.

## What You'll Gain

### Deep Expertise

*Master advanced NVH concepts and analysis techniques.*

### Hands-on Experience

*Work with Abaqus software and real experiments in the NVH Learning Lab.*

### Industry Insight

*Engage with leaders from Aimil Ltd. and Vibracoustic India Pvt. Ltd.*

### Professional Network

*Connect with peers and experts driving innovation in NVH.*

## Core Focus Areas

Real-world NVH applications

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Fundamentals of noise and vibration

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FEA for normal modes, harmonic & transient analysis

Damping and dynamic loading

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Experimental NVH techniques

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6TH OCTOBER 2025

### 6TH OCTOBER 2025 | SEGMENT ONE

**FDP inauguration function**

**Classroom session:**

- Real world case studies - dampers, vibration isolation, and multiphysics problems
- Vibration fundamentals
- Unbalance: Static, coupled, and dynamic unbalance; and SDOF system

### 6TH OCTOBER 2025 | SEGMENT TWO

**Finite element formulation for eigenvalue problems for a Multi-degree of Freedom (MDoF) system**

- Hamilton's principle and Lagrange equations
- Eigenvalue problem formulation for a multidegree of freedom system
- Closed form solution for an eigenvalue problem of a half car model

7TH OCTOBER 2025

### 7TH OCTOBER 2025 | SEGMENT ONE

**Classroom session**

**Consistent & lumped mass matrix formulation for various elements**

- Derivation of stiffness and mass matrices for various elements
- Generalized stiffness/mass/force for MDoF

**Abaqus hands-on-session**

SDOF and 2-DOF

### 7TH OCTOBER 2025 | SEGMENT TWO

**NVH Learning Lab (Live session with Flora Education Society, Pune)**

- Quarter car, half car, shaker table, and beat phenomenon test rigs

**NVH expert from M/s Amil Ltd. will make a presentation on DAO, sensors, and applications**

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8TH OCTOBER 2025

## 8TH OCTOBER 2025 | SEGMENT ONE

### Classroom session

#### FEA formulation for the frequency and time domain for a MDoF system

- Eigenvector properties / Raleigh quotient
- Modal participation factor / effective mass
- MDoF : FEA formulation for modal and direct approaches for harmonic analysis
- MDoF : FEA formulation for modal and direct approaches for transient dynamic analysis
- Force representation for harmonic and transient analysis in Abaqus

## 8TH OCTOBER 2025 | SEGMENT TWO

### Abaqus hands-on-session

Transient dynamic analysis

9TH OCTOBER 2025

## 9TH OCTOBER 2025 | SEGMENT ONE

### Classroom room session

- Type of damping
- Abaqus interface for various types of damping

### Fundamentals of acoustics

- Anatomy of ear      - A/B/C/D scales
- Octave bands      - Subjective and objective noise levels
- Sones and phones

## 9TH OCTOBER 2025 | SEGMENT TWO

### TIET NVH Lab Session

- Live experiments for NVH measurements using DAQ systems and signal processing
- Electrodynamic shaker and applications
- Wind tunnel testing and applications

## Experiential Learning Highlights

### LAB SESSIONS

#### Hands-on Simulation Training

Perform vibration analysis using **Abaqus software**.

#### Live NVH Experiments

Experience real-world NVH testing at the **NVH Learning Lab**, hosted by Flora Education Society, Pune.

### INDUSTRY CONNECT SESSIONS

#### Expert Insights from Industry Leaders:

Aimil Ltd.  
Vibracoustic India Pvt. Ltd.



10TH OCTOBER 2025

## 10TH OCTOBER 2025 | SEGMENT ONE

### Invited NVH industry expert

NVH Industry expert presentation from M/s Vibracoustics India Pvt. Ltd., Mohali

## 10TH OCTOBER 2025 | SEGMENT TWO

### Industrials applications in NVH

- Harmonic and transient forces definition in Abaqus software
- Modal alignment charts
- Order analysis
- Operating Deflection Shape
- Point mobility analysis
- Transfer function analysis

**NVH projects proposed by Tata Motors Ltd. with applications to ICE vehicles and EVs**

### Feedback session

Mr. Huzefa Salim, Director, Dassault Systemes Foundation will interact with the FDP participants

**Valedictory function**

## Meet the Expert

Dr. Mohan Godse earned his Ph.D. in Mechanical Engineering from the University of Iowa, USA, in 1991. He brings over 30 years of experience in the automotive industry, including 7 years at Ford Motor Company, USA, where he contributed to developing advanced body structure technologies aimed at reducing Noise, Vibration, and Harshness (NVH) and achieving weight optimization.

Dr. Godse has played a key role in establishing engineering centers for Tata Johnson Controls, Caparo India, and Endurance Technologies Ltd. in India. His expertise spans product and process engineering, aluminum alloy wheel and chassis component development, and material characterization and failure analysis. He has successfully developed automotive components for leading brands such as Yamaha, Honda, BMW, and Bajaj, among others. Currently, Dr. Godse serves as a senior consultant and trainer in the NVH domain. He has published extensively in international journals and conferences both in India and abroad.



**Dr. Mohan Godse**

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## Ideal Participants for NVH 2025

Faculty & Research Scholars from  
AICTE/UGC-affiliated or central institutions

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Industry Professionals with experience in FEA  
and Vibration Analysis

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Students keen to strengthen their NVH  
expertise

## Registration Essential: Secure your spot

**Programme Fee:** 100% Free Registration

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**Limited Seats:** Only 30 participants

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**Registration Deadline:** September 19, 2025

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**Selection Notification:** By September 23, 2025

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**Accommodation:** Available on request  
(chargeable)

## Connect with us Your Queries Answered

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## La Fondation Dassault Systèmes

La Fondation Dassault Systèmes' mission is to help schools, universities, research centers, museums and nonprofit organizations to push the limits of knowledge as well as to inspire young people with a passion for engineering, science and digital technology to create a better and more collaborative society. As part of this mission, it actively contributes to inventing new ways of sharing know-how and transforming learning practices that make it possible to detect new talents and help them achieve their dreams.



## Department of Mechanical Engineering, TIET

### Thapar Institute of Engineering and Technology

Established in 1956, the Thapar Institute of Engineering and Technology (TIET) is one of India's most prestigious institutions, holding NAAC A++ accreditation. Located on a 250-acre campus in Patiala, TIET is renowned for excellence in engineering education, research, and innovation. The institute fosters a vibrant community of visionary minds dedicated to developing groundbreaking solutions and transformative discoveries for a sustainable future, both nationally and globally.

Offering UG, PG, and doctoral programs in Mechanical, Mechatronics, Robotics & AI Engineering, the department focuses on research-led teaching, with 42+ funded projects worth ₹11.65 crore and active industry collaborations.

[www.med.thapar.edu](http://www.med.thapar.edu)

## PATRON

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## CO-PATRON

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## ORGANIZING COMMITTEE

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