ENGINEERING STAFF COLLEGE OF INDIA

Autonomous Organ of The Institution of Engineers (India)
(IMS [ISO 9001:2015, ISO 14001:2015, ISO 50001:2018, ISO 45001:2018],
ISO/IEC 17025:2017 Certified, AICTE & CEA Recognized Institution)
Old Bombay Road, Gachibowli, Hyderabad – 500 032. Telangana, India

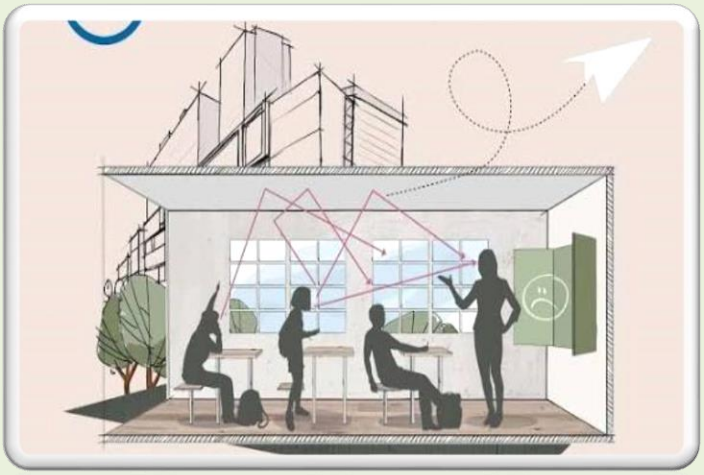
Management and Technology Division

Hybrid (Offline & Online) Continuing Professional Development Programme on

Structure-Borne and Air-Borne Noise: Fundamentals, Measurement & Control

Dates: 10 – 13 August 2026

at ESCI Campus, Hyderabad



INTRODUCTION

Noise and vibration significantly influence the performance, reliability, safety, and user comfort of modern engineering systems. In Defence, Public Sector Undertakings (PSUs), and Private Industries, effective control of structure-borne and air-borne noise is essential for meeting operational, quality, and regulatory requirements. As engineering systems become more advanced, professionals require a strong understanding of noise generation, transmission, measurement, and control.

The 4-Day Training Programme on "Structure-Borne and Air-Borne Noise: Fundamentals, Measurement & Control" provides participants with fundamental knowledge of acoustics, vibration, noise measurement techniques, signal analysis, and practical noise control methods. The programme combines theoretical concepts with demonstrations, case studies, and industrial applications to strengthen practical understanding.

Designed for engineers, scientists, researchers, and technical professionals from Defence organizations, PSUs, academia, and private industries, this programme equips participants with the skills to identify noise sources, perform accurate measurements, analyze acoustic data, and implement effective noise control solutions for improved system performance and compliance with engineering standards.

OBJECTIVES

The primary objectives are

- Understand the fundamentals of structure-borne and air-borne noise and their physical mechanisms.
- Learn standard techniques for noise and vibration measurement, instrumentation, and data acquisition.
- Develop skills in analyzing acoustic and vibration signals for source identification and diagnosis.

- Gain practical knowledge of noise control methods including passive and active mitigation techniques.
- Enable application of engineering standards and best practices for noise reduction in Defence, PSU, and industrial systems.

COURSE COVERAGE

The following course content will be detailed during the training programme:

- ✓ **Fundamentals of Acoustics & Vibration**
  - Basic concepts of sound, vibration, frequency, wavelength, and dB scale
  - Types of noise: structure-borne, air-borne, and their characteristics
- ✓ **Noise Generation & Transmission Mechanisms**
  - Sources of noise in mechanical and electromechanical systems
  - Transmission paths: solid structures, fluids, and air coupling
- ✓ **Structure-Borne Noise Analysis**
  - Vibration propagation in structures and machinery
  - Modal behavior and resonance effects in components
- ✓ **Air-Borne Noise Fundamentals**
  - Sound radiation from vibrating surfaces
  - Room acoustics and outdoor sound propagation
- ✓ **Noise Measurement & Instrumentation**
  - Sound level meters, accelerometers, microphones, and data acquisition systems
  - Calibration techniques and measurement standards
- ✓ **Signal Processing & Data Analysis**
  - Time and frequency domain analysis (FFT, spectrum analysis)
  - Filtering techniques and noise signal interpretation
- ✓ **Noise Source Identification Techniques**
  - Operational modal analysis and transfer path analysis
  - Practical approaches for root cause identification
- ✓ **Noise Control Strategies & Applications**
  - Passive control: damping, insulation, and barriers
  - Active noise control and industrial case studies

METHODOLOGY

Methodology of the Programme includes class room Sessions with Lecture/discussion with audio visual aid, benched marked practices if any, video shows, Chalk & Talk sessions, group discussions, case studies, debates, sharing of experiences, etc. All the sessions will be interactive demanding active participation from all the members. Case Method of Instructions will be the main method of knowledge facilitation. Technical Field and Social visits are integral part of the training methodology.

TARGET PARTICIPANTS

Engineers, officers, scientists, and managers from Defense organizations, Public Sector Undertakings (PSUs), and private industries involved in design, development, testing, operation, and maintenance of mechanical, electrical, and acoustic systems.

BENEFITS TO THE PARTICIPANTS

After completion, participants will be able to:

- Gain strong fundamentals in structure-borne and air-borne noise and their engineering significance.
- Develop practical skills in noise and vibration measurement, analysis, and interpretation.
- Learn effective techniques for identifying noise sources and understanding transmission paths.
- Acquire knowledge of proven noise control and mitigation strategies for industrial applications.
- Enhance capability to apply standards and best practices in Defence, PSU, and industrial environments.

EXPERT FACULTY

The faculty consists of experts from industry, research establishments and academia besides that from ESCI.

PROGRAMME DIRECTOR

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PROGRAMME DATES & TIMINGS

Dates: 10 – 13 August 2026

Timings: On the first day Registration will commence at **09:00 Hrs**. On all other days the programme timings will be from **09:45-17:15 Hrs** with breaks in between for tea and lunch.

COURSE FEE: **Rs. 22,000/- (Rupees Twenty Two Thousand only)** per Participant + GST@18% Extra. Fee includes, course material, course kit, twin-sharing/single AC accommodation as per availability, breakfast, lunch, dinner, tea / coffee and snacks during the actual days of training programme.

Online: WebEx platform
Rs. 14,000 /- (Rupees Fourteen Thousand only) per participant + GST@18% Extra.

Programme fee is to be paid in in favor of **"THE INSTITUTION OF ENGINEERS (INDIA) – ENGINEERING STAFF COLLEGE OF INDIA"** in the form of demand draft payable at Hyderabad. Alternatively, the payment may be made by Electronic Fund Transfer (EFT) to ESCI - **SB A/c No.0432104000039631 with The IDBI Bank Ltd., Gachibowli Branch, Plot No. 2-53/2, JNIBF, IIIT Junction, Gachibowli, Hyderabad-500032 by RTG's/ NIFT / IFSC Code No: IBKL0000432.** While using EFT method of payment, please ensure to communicate us your company name, our Invoice reference and programme title.

CERTIFICATION

A Certificate of participation will be awarded to each participant on conclusion of the programme.

GENERAL INSTRUCTIONS

- ESCI encourages participants to present case studies from their respective organizations.
- ESCI provides complimentary accommodation and boarding to the participants one day before commencement (Check-in 1200 h) and one day after conclusion (Check-out 1200 h) of the programme duration. Overstay charges will be applicable as per ESCI rules (subject to availability of accommodation).
- Well-developed Information Centre and Internet facilities are available to the participants free of cost.