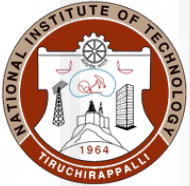


Anusandhan National Research Foundation (ANRF)

Sponsored
Two-Day Workshop
on

Vibration-Based Damage Detection in 3D Printed Composite Structures

24 & 25 April 2026



Organized by
Department of Mechanical Engineering
National Institute of Technology,
Tiruchirappalli – 620 015

Sponsored under SSR Activity – CRG -ANRF
Project

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About ANRF

Anusandhan National Research Foundation (ANRF) – established through an Act of Parliament: ANRF Act, 2023, to provide high-level strategic directions for research, innovation, and entrepreneurship in the fields of natural sciences, including mathematical sciences, engineering and technology, environmental and earth sciences, health and agriculture, and scientific and technological interfaces of humanities and social sciences. Anusandhan National Research Foundation (ANRF) has been established to promote research and development and foster a culture of research and innovation throughout India's Universities, Colleges, Research Institutions, and R&D laboratories. ANRF acts as an apex body to provide high-level strategic direction of scientific research in the country as per recommendations of the National Education Policy. ANRF forges collaborations among the industry, academia, research institutions and government departments.

About NIT Trichy

The National Institute of Technology Tiruchirappalli (NIT-T), formerly known as Regional Engineering College, was established in 1964 as a joint initiative of the Government of India and the Government of Tamil Nadu to meet the country's growing demand for skilled professionals in technology. Located in the heart of Tamil Nadu along the banks of the Cauvery River, the institute offers undergraduate programs in ten branches and postgraduate programs across twenty-six disciplines in Science, Engineering, Technology, Management, and Architecture. Additionally, it provides M.S. (by Research) and Ph.D. programs in all departments. NIT Tiruchirappalli retained its No. 1 position among all NITs in the NIRF ranking. NITT has a sprawling campus of over 800 acres and is equipped with state-of-the-art infrastructure cutting-edge laboratories, modern learning facilities, and industry partnerships to address global challenges. The Institute has signed MoUs with various Industries and Institutions both in India and abroad to promote collaborative research and consultancy.

About the Department

The Mechanical Engineering Department of NITT is one of the first departments established in NITT. It has had the reputation of being the finest in the country and is dedicated towards the advancement of technology and science. The Department of Mechanical Engineering offers a program in Mechanical Engineering at the B.Tech. level and offers Thermal Power Engineering & Industrial Safety Engineering at the M.Tech level. The Department is recognized for excellence in research, teaching, and service to the profession. The department has an excellent industrial interaction and contributes to the industry by offering consultancy services and sponsored research projects. The Mechanical Engineering Department of NITT has the credit to have the subject ranking in the Mechanical Engineering stream in the QS World University ranking in the place of 401-450. We have received the Institute BEST DEPARTMENT AWARD during 2019 and 2022 in recognition of our contribution to the growth of the institute through Teaching-Learning Resources, Research Professional practice, Graduation Outcome and Outreach Inclusivity in the Engineering discipline.

About the Programme

The Workshop on "Vibration-Based Damage Detection in 3D Printed Composite Structures" aims to introduce the fundamentals of vibration analysis and damage detection techniques for additively manufactured composite structures. The program will cover key topics such as additive manufacturing processes, fabrication of composite structures using 3D printing, experimental modal analysis, and vibration measurement techniques using accelerometers and impact hammers. The workshop will include both theoretical lectures and hands-on sessions to help participants understand the concepts as well as the practical implementation of vibration-based structural health monitoring techniques. It will provide participants with fundamental knowledge and practical exposure to modern techniques used for vibration-based damage identification in additively manufactured structures. The workshop is designed to strengthen participants' understanding of advanced vibration analysis and structural health monitoring methods, enabling them to integrate these concepts into teaching, research, and the development of innovative lightweight structures aligned with national research priorities under the ANRF initiative. **Certificates will be issued to all registered participants upon successful completion of the workshop.**

Programme Objectives

- To introduce the basics of additive manufacturing and 3D printing.
- To explain the fundamentals of vibration analysis and modal testing.
- To demonstrate vibration measurement using accelerometers and impact hammers.
- To provide hands-on training in vibration testing and analysis.
- To encourage research in structural health monitoring of 3D printed structures.

Key Highlights

- Overview of additive manufacturing and 3D printing technologies.
- Introduction to vibration analysis and experimental modal analysis.
- Demonstration of vibration measurement using accelerometers, impact hammers, and DAQ systems.
- Hands-on sessions on vibration testing and data acquisition.
- Hands-on sessions with 3D printed composite structures.
- Introduction to vibration-based damage detection techniques.
- Exposure to numerical and experimental methods for structural health monitoring.
- Interaction with experts and researchers in additive manufacturing and vibration analysis.

Topics Covered

- Introduction to Additive Manufacturing and 3D Printing
- 3D Printing of Composite and Lightweight Structures
- Fundamentals of Structural Vibrations
- Experimental Modal Analysis
- Vibration Measurement Techniques (Accelerometers, Impact Hammer, DAQ)
- Signal Processing for Vibration Data
- Vibration-Based Damage Detection Methods
- Structural Health Monitoring of Engineered Structures
- Case Studies on 3D Printed Structures

Expected Outcomes

- Participants will understand 3D printing of composite structures.
- Participants will learn the basics of vibration and modal analysis.
- Participants will gain experience in vibration measurement techniques.
- Participants will understand damage detection using vibration data.
- Participants will gain awareness of advanced structural health monitoring methods

How to reach NIT Trichy

- **BUS**
NIT Trichy 30 km from Panjapur bus stand (KKBT) via NH67
- **TRAIN**
NITT is located in Thuvakudi on the Trichy-Tanjore national highway, 17 km from Trichy Railway Junction.
- **AIR**
NIT Trichy is located approximately 18-22 km from TRICHY International Airport (TRZ) on the Trichy Thanjavur Highway (NH67)
- <https://maps.app.goo.gl/YgNUopKJcciRrfxs9>



Who Can Participate?

- Faculty members, Research Scholars and PG students from Mechanical, Manufacturing, Production, Aeronautical, Aerospace, Automobile disciplines from various institutions.
- The number of participants is limited to 30.

How to Register?

- Interested candidates should submit a duly filled registration form in the prescribed format should be submitted to the PI through Google Form:
- URL for submitting the registration form:
<https://forms.gle/GRDFM9mN4GAXse7R6>



- **Registration:** No registration fee but Registration mandatory.
- **Allowances:** Please note that no TA/DA and accommodation will be provided on payment basis. However, refreshments and a working lunch will be arranged for all participants during the workshop.
- Selected candidates will be notified via email
- **Last date for registration is 15.04.2026, 5 pm.**

