INFRASTRUCTURAL HEALTH MONITORING LABORATORY

The Infrastructure Health Monitoring Laboratory at Mahindra University is dedicated to equipping students with advanced knowledge and hands-on experience in evaluating the structural integrity and durability of infrastructure systems. The laboratory focuses on sustainable solutions to evaluate, monitor, and enhance the performance and longevity of civil infrastructure. The laboratory is equipped with state-of-the-art instruments to train students in conducting experiments involving non-destructive testing, vibration analysis, piezoelectric sensing, and advanced diagnostic methods for assessing the structural integrity of materials and systems.

The services offered by the laboratory are:

- **Academic:** Provide training to postgraduate and doctoral students as part of their curriculum and support project works in the field of structural health monitoring.
- **Research:** Focus on advanced topics such as real-time monitoring of infrastructure using non-destructive testing (NDT) methods, durability assessment of materials, development of low-cost non-destructive monitoring techniques, and evaluating the performance of innovative structural materials.
- **Consultancy:** Offer expertise in damage assessment, corrosion monitoring, long-term performance evaluation of infrastructure, and advanced numerical modeling for predictive maintenance.

Research expertise available with the laboratory:

- **Prof. Visalakshi Talakokula; (**Visalakshi Talakokula)
- **Dr. Sri Kalyana Rama Jyosyula;** (Sri Kalyana Rama Jyosyula)

On-going research projects:

- Life cycle monitoring of blended concrete systems using embedded piezoelectric sensor

Completed project works:

List of Course Projects: MTech

IHM-2022

Student name	Project title
Amrutha	To determine the natural frequency of a simply supported steel beam
Asrith	Determine the exact natural frequency of a structure
Dheeraj	A comparative study of SHM and NDT for various concrete system
Kishan	Identifying damage in concrete cube specimen using piezo sensor
Meghana	Natural frequency of steel frame using piezoelectric sensors
Naveen	Identifying incipient to severe damage in steel beam
Sai Sri Vathsa	Wall crack detection based on machine learning algorithm
Kaushik	Identification of damage in the bamboo structure using piezo sensor
Surendra	Detection of damages & damage intensities in plates with bolted connection using PZT sensors under ideal & realistic conditions
Surya Sai Teja	Corrosion diagnosis of rebars and coated rebars using piezo sensors

Swetha	Identifying the damage in steel frame
Krishna Vardhan	Identifying damage in steel using different piezo configurations
Sai Nikhitha	Damage location of bridge using SHM
Samskruthi	Energy harvesting by foot steps using piezo electric sensors
Mandar	Strength gain for different concrete systems using piezo sensors

IHM-2023

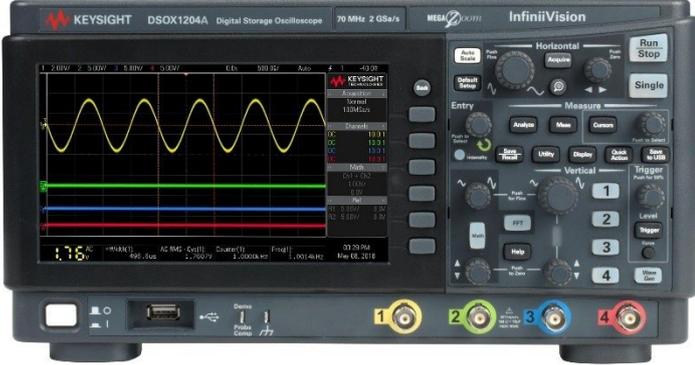| Student name	Project title
Vigneswar Shankar	Development of smart washer for monitoring the bolted joints steel structures
Tariq S	Corrosion monitoring of plain, TMT and epoxy coated rebar using piezo sensors
Venkata Ramana	Monitoring carbonation effect of concrete beam

IHM-2024

Student name	Project title
Aqib Shabir	Monitoring the directionality effect of 3d printed concrete cubes
Sarat Chandra	
Purna	Damage identification of pre-stressed concrete panel using EMI technique
Vinod	
Yashwanth	Assessment of self-healing concrete using piezoelectric sensors
Sharat Chandra	
Hemantha Rao	Monitoring and damage detection of fabricated scaled cable bridge
Mahesh	
Mukesh Panda	
Sreemanth Reddy	
Gajula Nehan	Monitoring the moisture absorption and damage in bamboo using piezo sensor
Srihari	Damage identification of fiber infused epoxy bamboo composite using piezo sensor
Srinivas	
Kavya	Monitoring of damage in steel plate using local and global SHM techniques
Swathi	
Mounika	Identification of slip failure of fiber reinforced concrete using PZT sensor
Sathwika	

B.Tech-2024

Student name	Project title
Naga Pranav, Jatin, Saketh Kumar, Nithin Reddy, Vijay Vardhan, Naveen Chowdary	AI based prediction of infrastructure deterioration based on the sensor data

Equipment available in the laboratory:

The Infrastructure Health Monitoring Laboratory is equipped with advanced instruments, including a Keysight High-Precision LCR Meter for inductance, capacitance, and resistance measurement, a Keysight Digital Storage Oscilloscope for signal visualization, a Keysight Waveform Generator for electrical waveform generation, a Keithley Digital Multimeter for precise electrical parameter measurement, a Dytran Impulsive Hammer for dynamic material testing, and a Dytran Uni-Axial Accelerometer for vibration and acceleration analysis, along with specialized software tools for data analysis and simulation to support academic, research, and consultancy activities.

S.No.	Name of the instrument	Photo
1	Keysight high precision LCR meter	
2	Keysight Digital Storage Oscilloscope	
3	Keysight Waveform Generator	
4	Keithley Digital Multi Meter	

5	Dytran Impulsive Hammer	
6	Dytran Uni-axial Accelerometer	
7	Electrical strain gauge	