Report
on
1-Day Workshop on
"Earthquake Mitigation and Management"

organized

by

Centre for Disaster Risk Reduction,

Department of Civil Engineering,

and

Department of Architecture

Islamic University of Science and Technology,
Awantipora, Kashmir-192122 (J&K)

In collaboration with

Department of Disaster Management, Relief,
Rehabilitation, and Reconstruction,
Govt. of Jammu and Kashmir

VENUE: Lal Ded Auditorium, IUST, Kashmir

17th, September 2025

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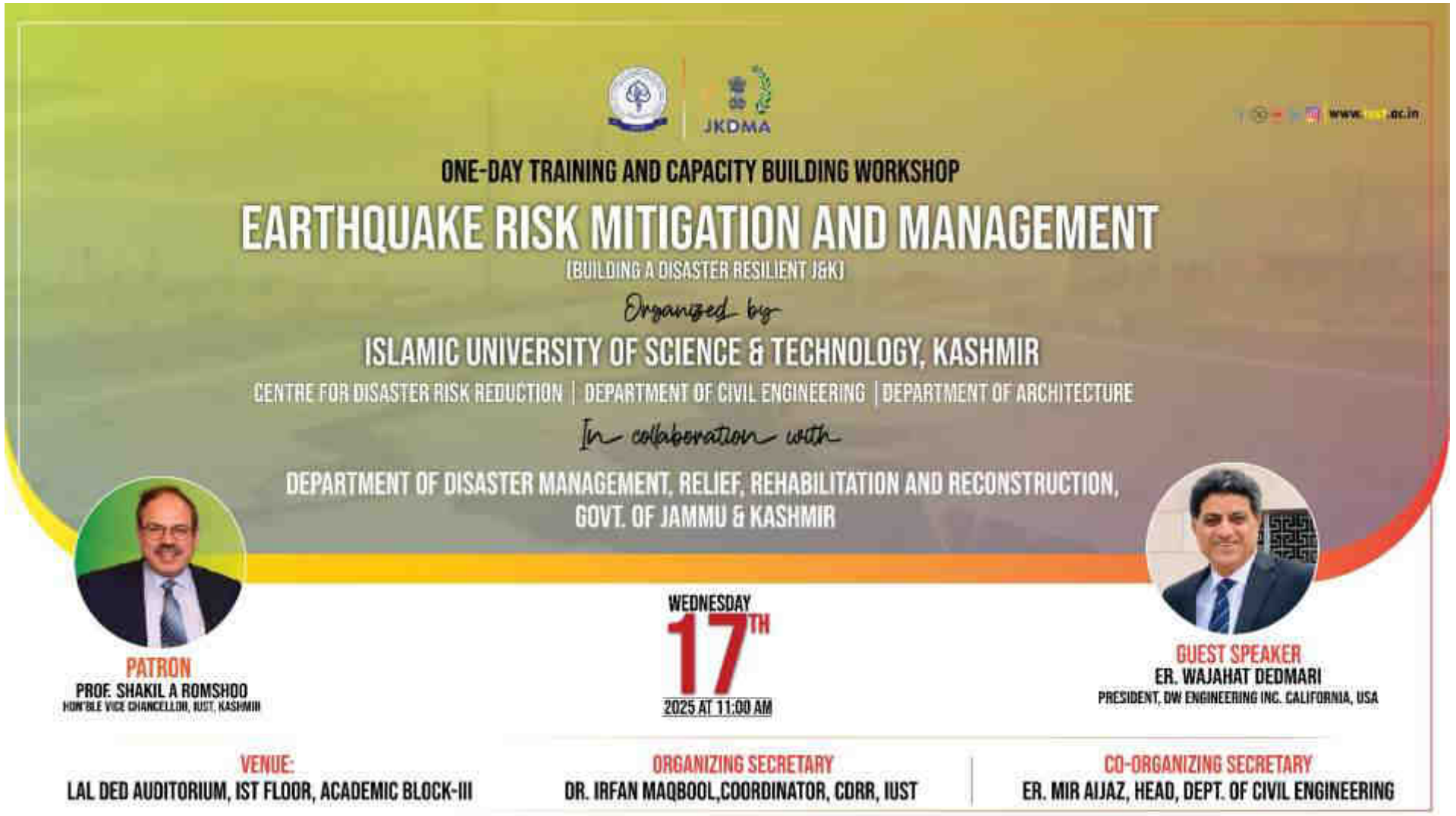

JKDMA
ONE-DAY TRAINING AND CAPACITY BUILDING WORKSHOP
EARTHQUAKE RISK MITIGATION AND MANAGEMENT
(BUILDING A DISASTER RESILIENT J&K)
Organized by
ISLAMIC UNIVERSITY OF SCIENCE & TECHNOLOGY, KASHMIR
CENTRE FOR DISASTER RISK REDUCTION | DEPARTMENT OF CIVIL ENGINEERING | DEPARTMENT OF ARCHITECTURE
In collaboration with
DEPARTMENT OF DISASTER MANAGEMENT, RELIEF, REHABILITATION AND RECONSTRUCTION, GOVT. OF JAMMU & KASHMIR
PATRON
PROF. SHAKIL A ROMSHOO
HON'BLE VICE CHANCELLOR, IUST, KASHMIR
WEDNESDAY
17TH
2025 AT 11:00 AM
GUEST SPEAKER
ER. WAJAHAT DEDMARI
PRESIDENT, DW ENGINEERING INC. CALIFORNIA, USA
VENUE:
LAL DED AUDITORIUM, IST FLOOR, ACADEMIC BLOCK-III
ORGANIZING SECRETARY
DR. IRFAN MAQBOOL,COORDINATOR, CDRR, IUST
CO-ORGANIZING SECRETARY
ER. MIR AIJAZ, HEAD, DEPT. OF CIVIL ENGINEERING

1. About IUST

The Islamic University of Science and Technology (IUST), located in Awantipora, Kashmir, is a premier higher education institution established with the aim of advancing knowledge and fostering innovation in science, technology, and other academic disciplines. Founded in 2005, the university has become a hub for academic excellence, research, and professional development in the region, playing a pivotal role in addressing local and global challenges. IUST offers a wide range of undergraduate, postgraduate, and doctoral programs across various disciplines, including engineering, technology, social sciences, business, humanities, and architecture. The university emphasizes a multidisciplinary approach to education, integrating modern research and teaching methodologies to enhance students' knowledge and skill sets. The university is deeply committed to promoting research and innovation. It has established several research centers and initiatives to tackle emerging issues, including the Centre for Disaster Risk Reduction (CDRR), which focuses on disaster preparedness, mitigation, and resilience-building—an increasingly vital area of study for the region. IUST prioritizes student engagement and development, offering numerous co-curricular activities, workshops, and seminars to enhance students' leadership skills, critical thinking, and professional growth. The university fosters a dynamic campus culture, encouraging students to participate in debates, sports, and other extracurricular activities. IUST maintains strong collaborations with national and international universities, research institutions, and industries. These partnerships aim to foster academic exchange, joint research projects, and knowledge-sharing in sustainable development, climate change, disaster risk reduction, and technological advancements. IUST envisions becoming a leader in higher education and research, not just within Jammu & Kashmir but also on the global stage. It is committed to empowering students to meet the needs of the modern world, with a strong emphasis on innovation, sustainability, and community service. The university's growing reputation as a center of learning is reflected in its expanding academic programs, world-class faculty, and cutting-edge research facilities, all contributing to its goal of shaping the future of education and development in the region.

2. About JKDMRRR

The Jammu & Kashmir Department of Disaster Management, Relief, Rehabilitation & Reconstruction (JKDMRRR) came into effect on 30 December 2016 vide Cabinet Decision of the J&K govt. The mission of the Department of DMRRR is to ensure the safety of communities by promoting a community-based approach to Disaster Risk Reduction (DRR). This involves reducing vulnerabilities and enhancing effective disaster response through awareness programs and capacity-building initiatives. The department is dedicated to implementing appropriate measures to prevent danger and mitigate risks, ensuring that both natural and man-made disasters are addressed comprehensively. In times of disaster, the DMRRR provides timely assistance to those in distress, helping them recover and rebuild. Additionally, the department plays a key role in resolving issues related to displaced communities, including Kashmiri/Jammu migrants, those displaced in 1947, Chhamb displaced persons (1965/1971), and West Pakistani refugees. It aims to bridge the gap in identifying sufferers of natural calamities, ensuring that all affected individuals receive the support they need. The DMRRR envisions a future where Disaster Risk Reduction (DRR) is fully integrated into all developmental initiatives, ensuring the sustainability of investments and creating a disaster-resilient Jammu & Kashmir. By enhancing the capacity of all stakeholders—governments, communities, and institutions—the department seeks to respond to disasters in a planned and effective manner, minimizing the loss of lives, livelihoods, and critical infrastructure. This includes protecting essential services like healthcare, education, and social and cultural assets from the impacts of disasters. Moreover, the department is committed to providing rapid and appropriate assistance to disaster victims, facilitating their recovery process efficiently. Alongside disaster management efforts, DMRRR continues to support Kashmiri/Jammu migrants, displaced persons of 1947, Chhamb displaced persons (1965/1971), and West Pakistani refugees, ensuring their issues are addressed and their rehabilitation needs met. The overarching goal is to make Jammu & Kashmir a safer, more resilient region, prepared to face any disaster.

3. Programme Schedule

PROGRAMME SCHEDULE
One-Day Training and Capacity Building Workshop
on
"Earthquake Risk Mitigation and Management"
Jointly Organised by
Centre for Disaster Risk Reduction,
Department of Civil Engineering, &
Department of Architecture
Islamic University of Science and Technology, Kashmir
in collaboration with
Department of Disaster Management, Relief, Rehabilitation and Reconstruction,
Govt. of Jammu & Kashmir

Wednesday, 17th September, 2025

Venue: Lal Ded Auditorium, 1st Floor, Academic Block-III, IUST

Activity	Dignitaries	Time (IST)
Welcome Address	**Er. Mir Aijaz Ahmad** Head Dept. of Civil Engineering	11:00 am–11:10 am
Presidential Address	**Dr. Kaisar Javeed** Dean School of Engineering and Technology	11:10 am–11:20 am
Felicitation of the Guest		11:20 am–11:22 am
Lecture by Guest Speaker	**Er. Wajahat Dedmari** President, DW Engineering Inc. California, USA	11:22 am–12:25 pm
Question and Answer	All Participants	12:25 pm–12:55 pm
Vote of Thanks	**Mr. Qazi Qamar Iqbal Qari** Dean School of Architecture, Planning & Geomatics	12:55 pm–01:00 pm
Lunch Break		01:00 pm–02:00 pm
Site Visit with Students	Er. Wajahat Dedmari	02:00 pm–03:30 pm
End of Workshop		

Organizing Secretary
Dr. Irfan Maqbool Bhat
Coordinator, CDRR, IUST

Co-Organizing Secretary
Er. Mir Aijaz Ahmad
Head, Dept. of Civil Engineering, IUST

4. Summary of the workshop

4.1. Introduction

The One-Day Training and Capacity Building Workshop on *"Earthquake Risk Mitigation and Management"* was organised with the objective of enhancing awareness, technical understanding, and practical capacity among students, faculty, and professionals regarding seismic risks and earthquake-resilient construction, particularly in the context of Kashmir Valley. Given that Jammu & Kashmir falls in Seismic Zone V, the highest risk zone in India, the workshop was highly relevant and timely.

The programme brought together academicians, administrators, engineers, architects, students, and disaster management professionals, and featured a highly technical and experience-based lecture by Er. Wajahat Dedmari, President, DW Engineering Inc., California, USA—an internationally experienced structural engineer with over 27 years of practice in seismic design and retrofitting.

4.2. Inaugural Session

The workshop commenced with a Welcome Address by Er. Mir Aijaz Ahmad, Head, Department of Civil Engineering, who highlighted the vulnerability of Kashmir to earthquakes and stressed the need for capacity building among young engineers and architects. He underscored the role of academic institutions in promoting disaster-resilient infrastructure.

This was followed by the Presidential Address by Dr. Kaisar Javeed, Dean, School of Engineering and Technology, who emphasised the importance of integrating disaster risk reduction into technical education and encouraged students to take earthquake engineering and resilience studies seriously as a professional responsibility.

The guest speaker, Er. Wajahat Dedmari, was then formally felicitated, acknowledging his international expertise and contribution to the field of seismic engineering.

4.3. Keynote Lecture by Er. Wajahat Dedmari

The main technical session was delivered by Er. Wajahat Dedmari, President of DW Engineering Inc., California, USA, who structured his lecture around three major pillars:

1. **Why Kashmir is a Seismic Zone V Region – Historical and Geological Evidence**
2. **Current Construction Practices in Kashmir and Their Seismic Vulnerability**
3. **Principles of Earthquake-Resistant Design and Code Compliance**

Er. Wajahat Dedmari, delivered an in-depth, technically rich, and experience-based lecture that provided a comprehensive understanding of earthquake risk, seismic vulnerability, and structural safety, particularly in the context of Kashmir. He began by firmly establishing that Kashmir's classification as a Seismic Zone V region is not a theoretical label but a scientifically proven reality supported by geological structures, active fault systems, and extensive historical records. Referring to a major study conducted by the Department of Earth Sciences, University of Kashmir, and funded by the Department of Science and Technology, Government of India, he explained that nearly 1,000 years of documented history reveal at least 17 major earthquakes that have affected the Kashmir region. Several of these earthquakes had epicentres within the valley itself, resulting in large-scale destruction. He particularly highlighted the devastating earthquake of 1555, which altered the course of the Veshu Nallah and permanently changed the landscape and settlement patterns, as well as the 1828 earthquake that submerged the then capital near Wular Lake, destroyed more than 1,200 houses in Srinagar, caused nearly 1,000 deaths, and produced aftershocks for several months. He further referred to the 2005 Muzaffarabad earthquake of magnitude 7.6, stating that although its epicentre was outside the Kashmir Valley, the scale of destruction clearly demonstrated the extreme vulnerability of construction practices that are still being followed in Kashmir today.

Elaborating on the geological context, Er. Dedmari explained the significance of the Jhelum Fault System, which runs from South Kashmir through Srinagar, Baramulla, and into Muzaffarabad, closely following the course of the river Jhelum. He pointed out that this fault system, along with several major and minor faults, has historically been responsible for repeated seismic activity in the region. He also mentioned recent findings suggesting the presence of additional active faults in the Gulmarg area and possibly within Srinagar city, further increasing the seismic risk. He strongly emphasised that earthquakes in Kashmir are inevitable and that it is not a question of "if" but "when," making preparedness, correct planning, and seismic-compliant construction absolutely essential.

A major portion of his lecture was devoted to a critical examination of current construction practices in Kashmir, which he described as extremely alarming and dangerously incompatible with the seismic risk of the region. He explained that the majority of residential buildings in Kashmir are unreinforced masonry structures, constructed using brick or concrete blocks without any reinforcement and supporting RCC slabs or wooden floors. Technically, these are classified as unreinforced masonry buildings, which possess negligible tensile strength and almost no ductility. He explained that during earthquakes, such walls are subjected to in-plane shear forces that lead to

diagonal cracking and sliding failures, as well as out-of-plane bending forces that cause walls to topple and collapse. He also highlighted the weak connection between walls and floors or roofs, which often results in separation and total structural failure. Drawing from international experience, he pointed out that unreinforced masonry construction was banned in seismic zones 4 and 5 in California as early as 1936, yet the same typology continues to be widely used in Kashmir. Using photographic evidence from the Muzaffarabad and Christchurch earthquakes, he demonstrated how entire walls fell outward, buildings split vertically, and roofs collapsed due to lack of anchorage, leading to heavy loss of life. He warned that continuing such practices in Kashmir is effectively an invitation to large-scale casualties.

In addition to unreinforced masonry, Er. Dedmari expressed serious concern over the widespread use of non-ductile reinforced concrete frame buildings in Kashmir. He explained that most multi-storey buildings in the region are constructed with beam-column frames that lack seismic detailing, such as closely spaced stirrups, seismic hooks, and proper confinement in beam-column joints. These frames are typically designed only for gravity loads and not for the horizontal forces generated during earthquakes. He categorically stated that as per Clause 5.4.2.6 of the National Building Code of India 2016, ordinary moment-resisting frames are not permitted in seismic zones 3, 4, and 5. However, he observed that almost all RCC frame buildings in Kashmir fall into this prohibited category, representing a direct violation of national standards. Using images from the 2005 Muzaffarabad and Islamabad earthquakes, he illustrated how columns sheared off at joints, beam-column connections failed, floors pancaked, and entire buildings collapsed progressively in a domino effect. He explained that earthquake forces are horizontal in nature and concentrate at beam-column joints, and without adequate confinement and ductility, these joints fail suddenly and catastrophically, leading to complete structural collapse.

Er. Dedmari then focused on the fundamental concept of ductility, describing it as the soul of earthquake-resistant design. He explained the difference between brittle and ductile behaviour, stating that brittle failure occurs suddenly and without warning, often resulting in catastrophic collapse, whereas ductile behaviour allows structures to deform gradually, showing visible cracking and deformation that provides occupants time to evacuate. He emphasised that in seismic design, beams should yield before columns, plastic hinges should form away from joints, and joint failure must be avoided at all costs. He explained that brittle failure often leads to progressive collapse, while ductile design ensures life safety even if the building is damaged. He repeatedly reinforced that buildings should be designed to bend and dissipate energy rather than break.

In explaining how ductility is achieved, he traced the evolution of reinforcement detailing

from open stirrups used in the early 20th century, to closed stirrups with 90-degree hooks, and finally to modern seismic detailing using 135-degree seismic hooks and closely spaced confinement ties. He explained that confinement reinforcement holds the concrete together, prevents buckling of longitudinal bars, increases shear strength, and significantly enhances energy dissipation during seismic shaking. He pointed out that typical columns in Kashmir have widely spaced stirrups and no confinement in critical zones, making them highly vulnerable to failure. He stressed that without proper confinement, concrete behaves like weak stone and cannot withstand earthquake forces, making seismic detailing non-negotiable.

Another major concern raised by Er. Dedmari was the increasing trend of soft storey buildings in Kashmir, where the ground floor is left open for parking and residential units are constructed above. He explained that such configurations create stiffness irregularities, and during earthquakes, the soft storey attracts maximum deformation, leading to column failure and total building collapse. Drawing from his experience in Los Angeles, he mentioned that over 30,000 soft storey buildings were identified and mandated for retrofitting due to their extreme vulnerability. He warned that Kashmir is unknowingly repeating this dangerous mistake, which could have devastating consequences in a future earthquake.

Er. Dedmari also made a strong appeal for local research and fault mapping, particularly by students and faculty of IUST. He urged them to identify and map active and blind faults, lineaments, ground rupture zones, near-fault effects, and areas prone to site amplification within the Kashmir Valley. He explained that design criteria change significantly when construction is close to a fault and that blind design without understanding local geology is highly risky. He described such research as “Sadqa-e-Jaria,” knowledge that would save lives for generations, and encouraged the university to take a leadership role in building a local seismic database for Kashmir.

On the academic front, he strongly advocated for the integration of earthquake engineering and disaster risk reduction into the curriculum. He welcomed the Vice-Chancellor’s vision of introducing a minor or specialisation in earthquake engineering at IUST and stressed that producing engineers and architects in Seismic Zone V without adequate training in seismic design is a systemic failure. He reminded students that degrees alone are not sufficient and that continuous learning is essential. He emphasised that in Kashmir, earthquake engineering is not optional but a professional and moral responsibility.

He also discussed the urgent need for retrofitting existing buildings, explaining that most of the current building stock in Kashmir is structurally deficient. He outlined various retrofitting

strategies such as column jacketing, addition of shear walls, creation of core walls, and steel bracing systems. He stressed that although demolishing unsafe buildings is unrealistic, retrofitting is technically possible, economically feasible, and socially necessary, and remains the only practical option for improving safety.

Throughout his lecture, Er. Dedmari repeatedly reinforced the message that earthquakes do not kill people, bad buildings do. He made it clear that the technology, codes, and knowledge required to build safely already exist, both nationally and internationally. What is lacking, according to him, is awareness, strict enforcement of regulations, and professional ethics. His lecture served as a powerful wake-up call to students, professionals, and authorities alike, urging immediate action to improve construction practices and to prioritise life safety in all future development in Kashmir.

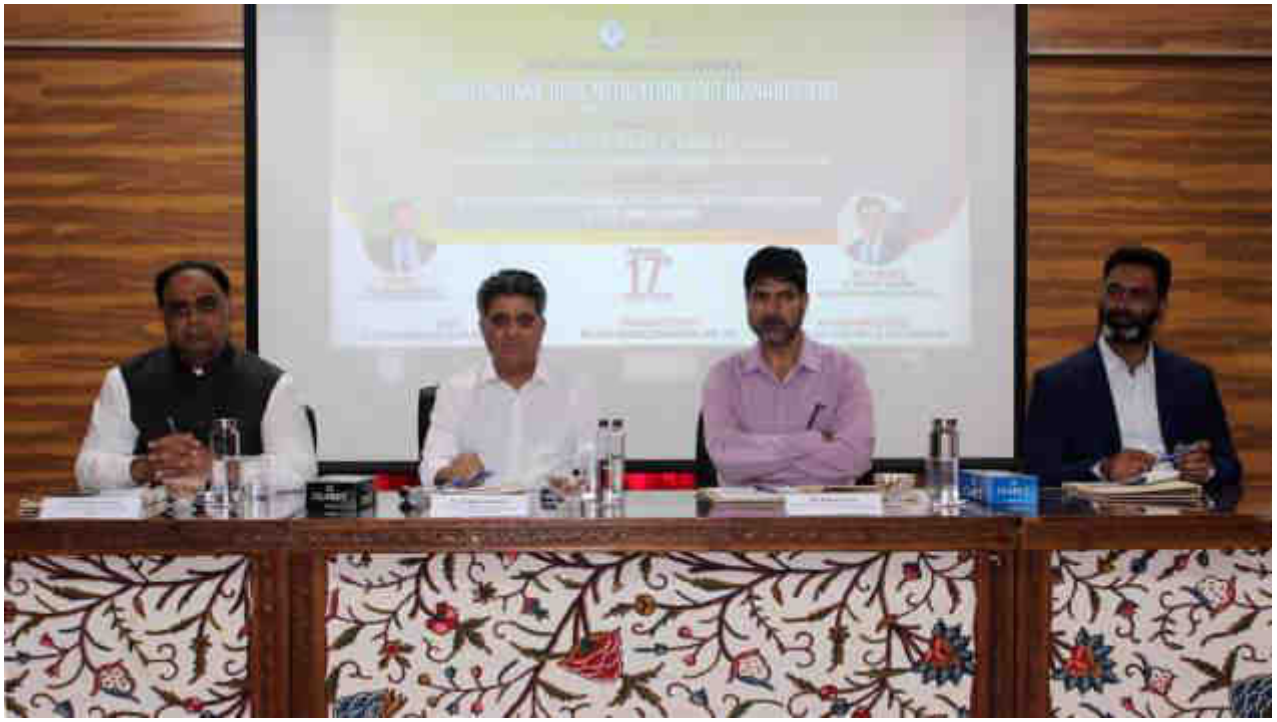
4.4. Key Recommendations

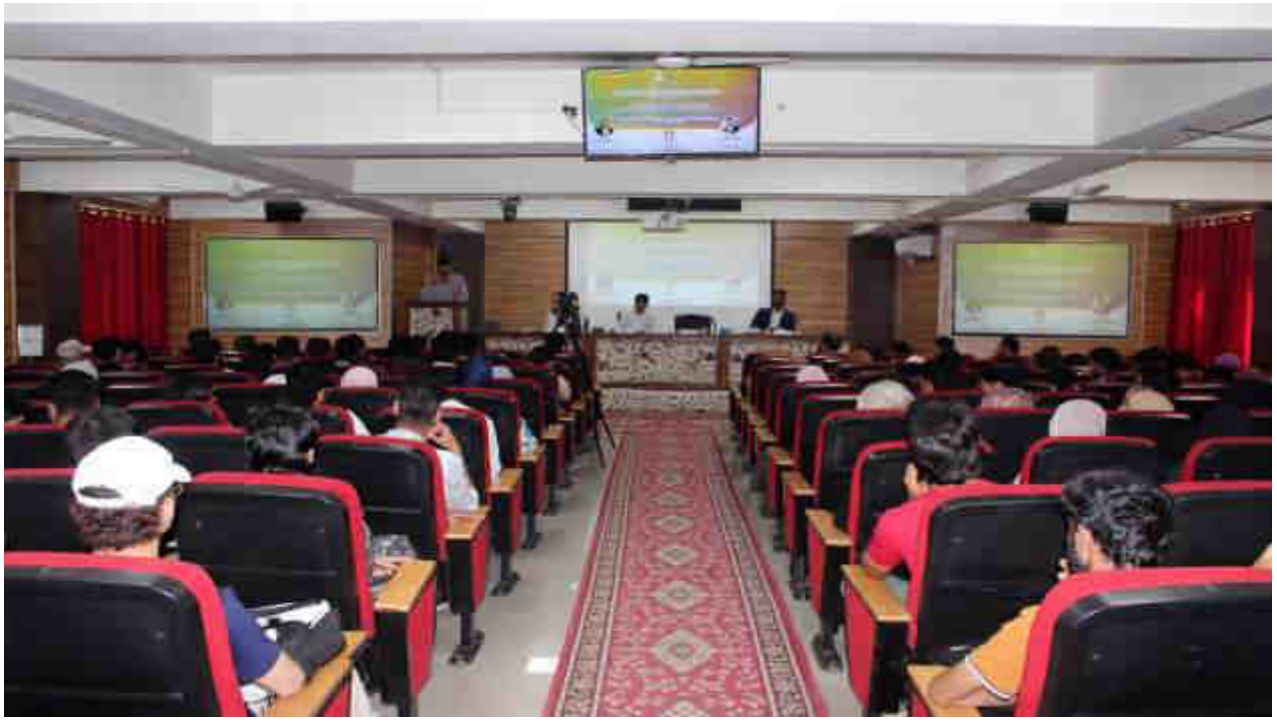
The One-Day Training and Capacity Building Workshop on "Earthquake Risk Mitigation and Management" resulted in several important academic, technical, and policy-oriented outcomes. Key recommendations include:

1. **Stop unsafe construction practices in Kashmir immediately**, especially unreinforced masonry and non-ductile RCC frame buildings, as they are extremely dangerous in Seismic Zone V.
2. **Ensure strict compliance with the National Building Code (NBC 2016)** and all seismic design standards; gravity-load-only designs must not be permitted.
3. **Adopt only ductile, earthquake-resistant structural systems** such as special moment-resisting frames, shear wall systems, or dual systems for all new constructions.
4. **Make proper seismic detailing mandatory**, including confinement reinforcement, closely spaced stirrups, and 135-degree seismic hooks in columns and beam–column joints.
5. **Regulate and control soft storey buildings** (open ground floors for parking) and ensure existing soft storey structures are assessed and retrofitted.
6. **Launch a large-scale retrofitting programme for existing unsafe buildings**, prioritising schools, hospitals, government buildings, and other critical infrastructure.
7. **Initiate systematic fault mapping and local seismic research in Kashmir**, including identification of active and blind faults, near-fault effects, and site amplification zones.
8. **Integrate earthquake engineering as a core component of education** at IUST through minors, specialisations, and strengthened curriculum content.

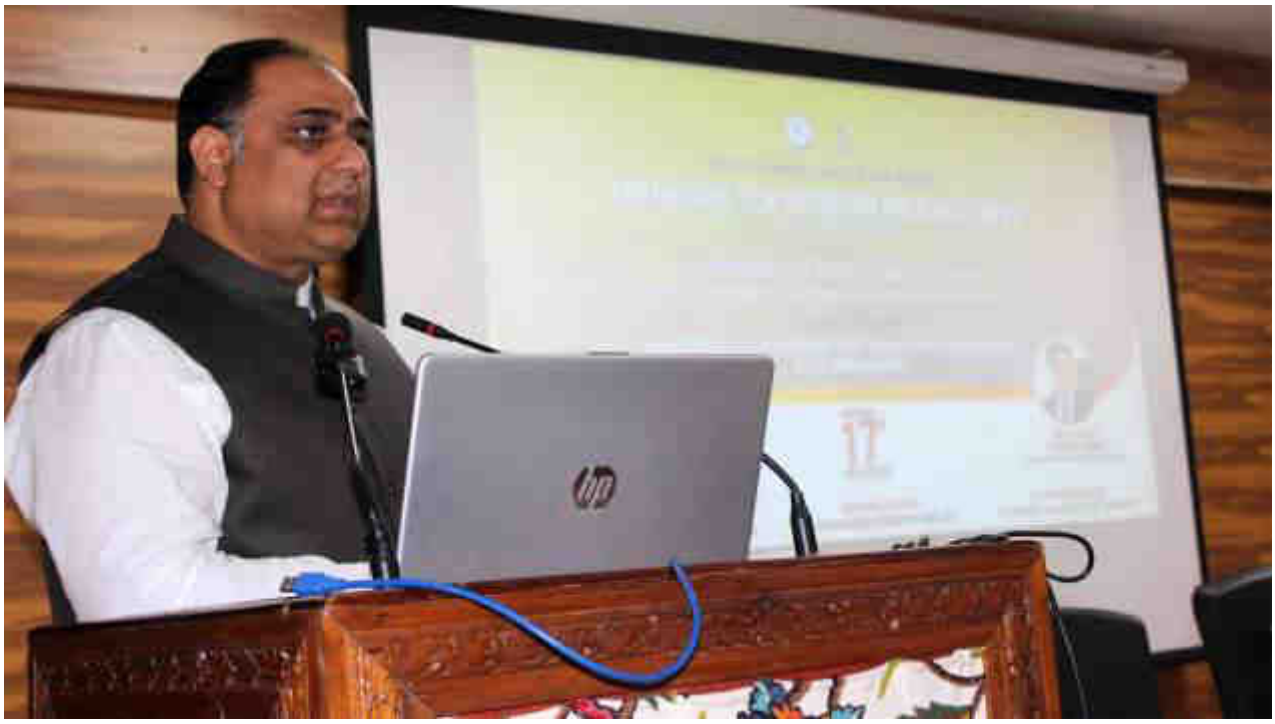
9. **Build capacity of engineers, architects, contractors, and masons** through regular training on earthquake-resistant construction and seismic detailing.
10. **Promote strong professional ethics among engineers and architects**, rejecting shortcuts and cost-cutting that compromise life safety.
11. **Create widespread public awareness about earthquake risk and safe construction practices**, so that communities demand safer buildings.
12. **Strengthen coordination between universities, government departments, and local authorities** for unified action on seismic safety.
13. **Treat earthquake risk as a development priority, not just a disaster issue**, and plan all infrastructure assuming a major earthquake will occur.
14. **Always follow the core principle: "Earthquakes do not kill people. Bad buildings kill people."**

PHOTO GALLERY

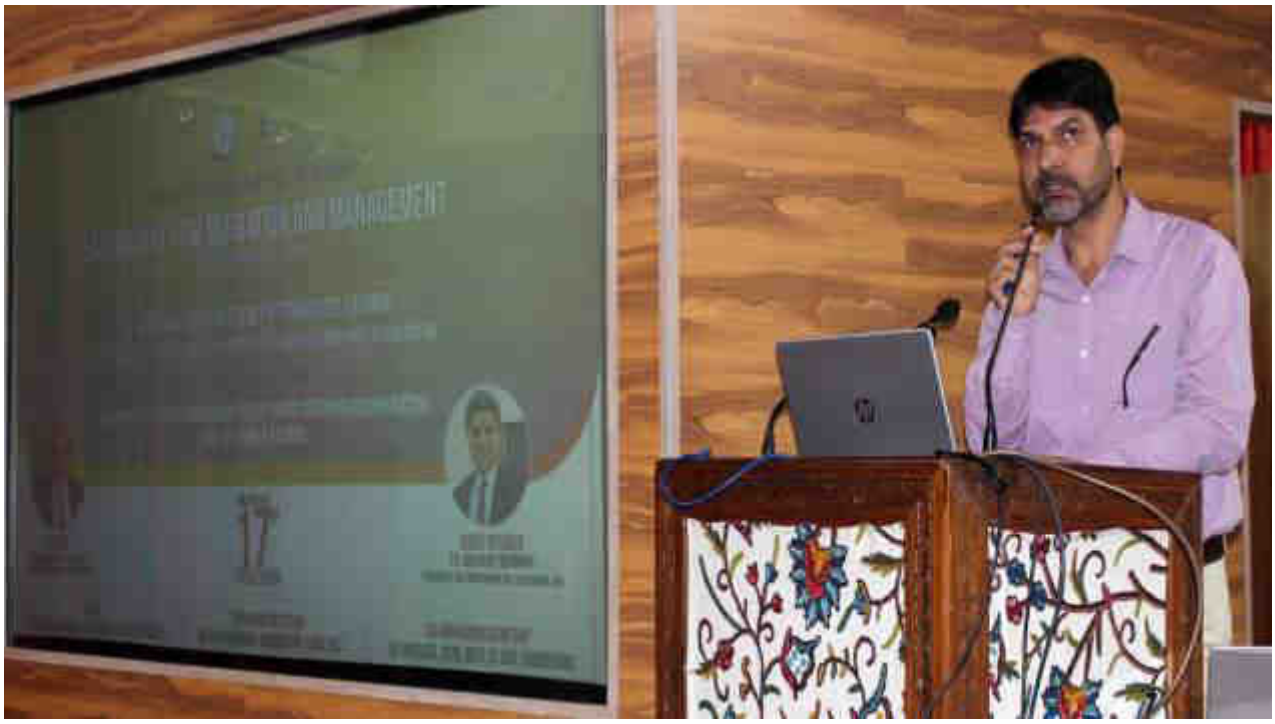




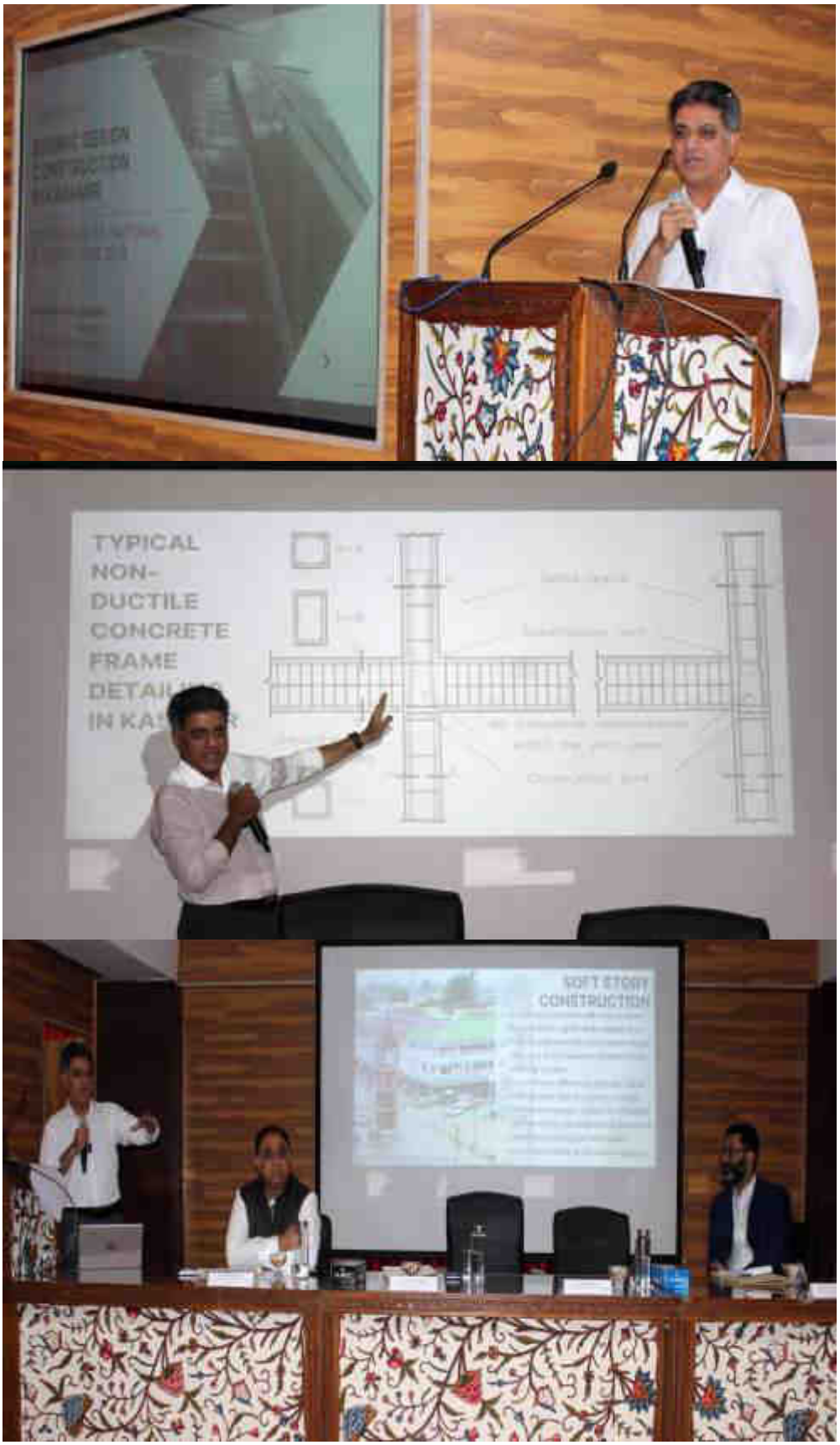
Inaugural Session at Lal Ded Auditorium, IUST



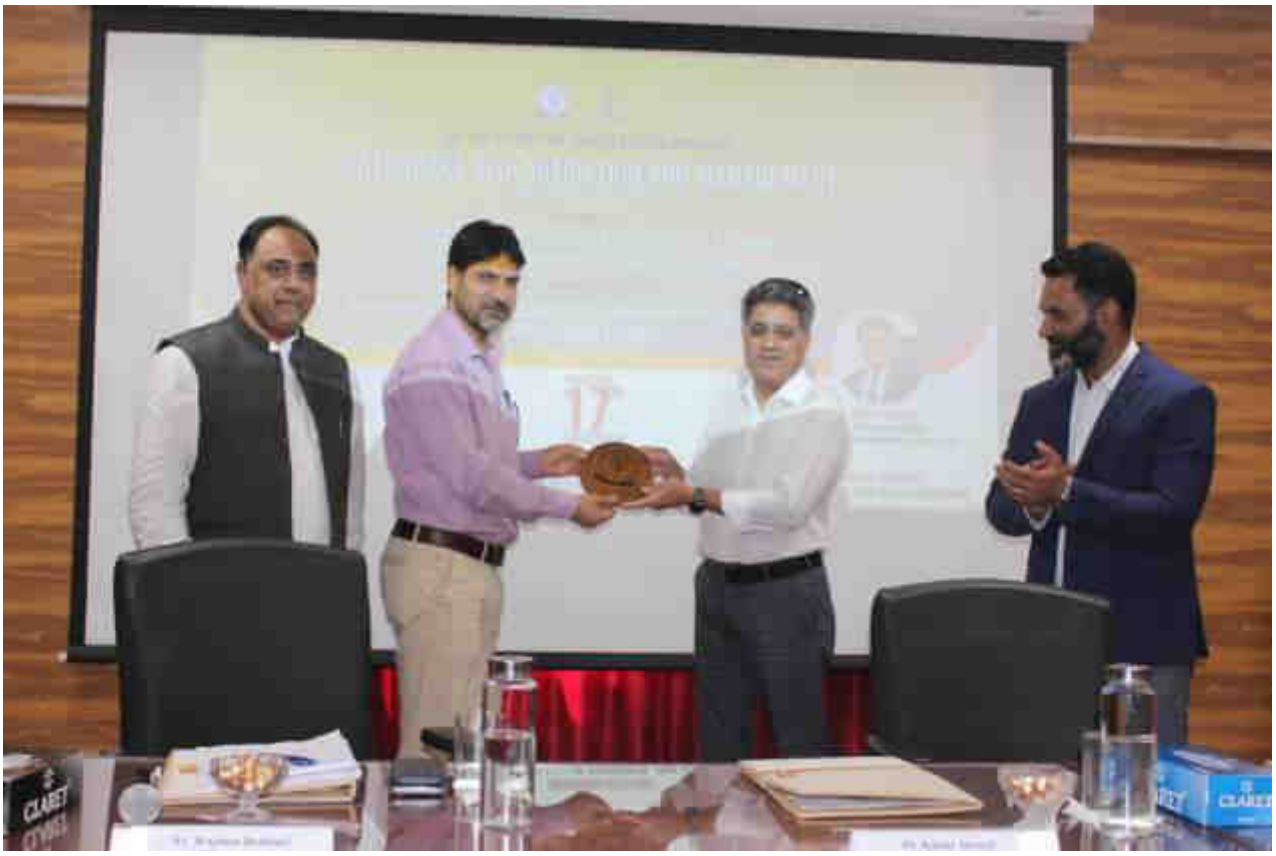
Welcome address by Er. Mir Aijaz Ahmad, HoD, Dept. of Civil Engineering, IUST



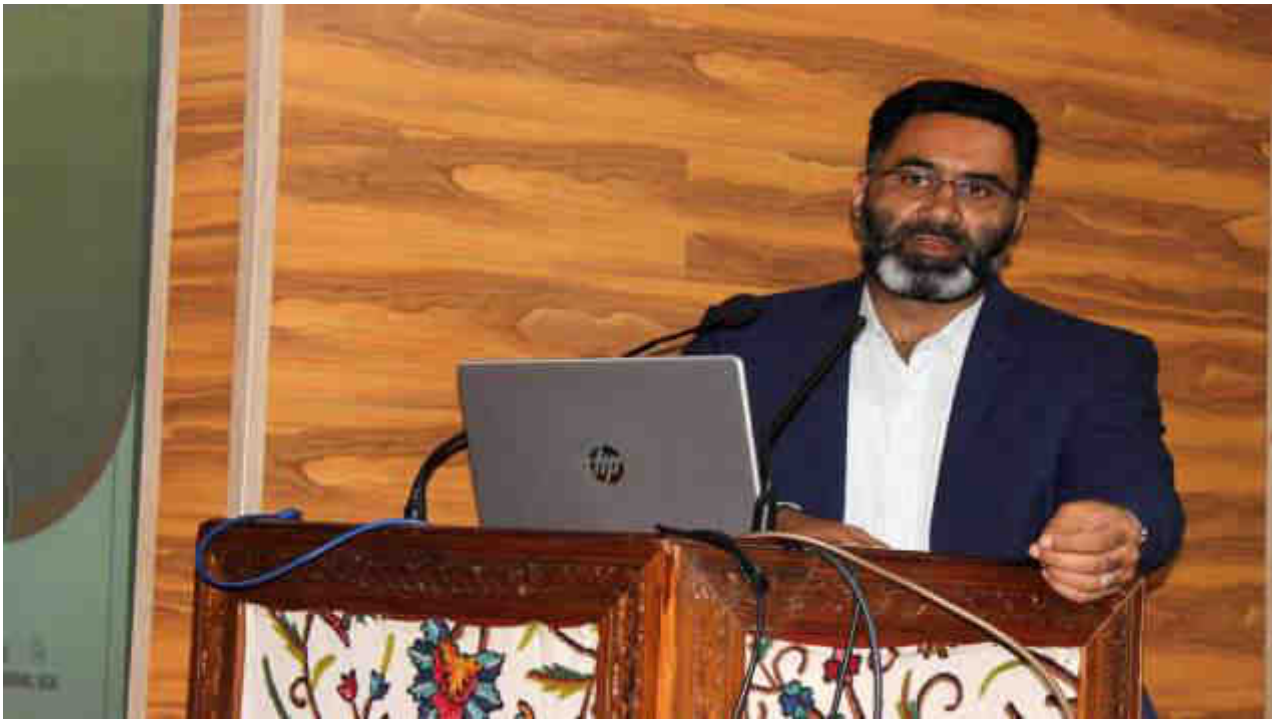
Presidential address by Dr. Kaisar Javeed, Dean, School of Engineering and Technology, IUST



Keynote Address by the Speaker, Er. Wajahat Dedmari, President, DW Engineering Inc., California, USA



Felicitation of the Speaker



Vote of thanks by Mr. Qazi Qamar Iqbal Qari, Dean, School of Architecture, Planning & Geomatics