

Report on Five Days of Self Sponsored Online Short-Term Course “Sustainability Advancements in Structural and Transportation Engineering” held from 11 - 15 March 2024 in CED, NITJ

Theme of the STC

The Civil Engineering Department has organized a Five Day Self-Sponsored Online Short-Term Course (STC) on the topic “**Sustainability Advancements in Structural and Transportation Engineering**” held from 11 - 15 March 2024. The course was designed to disseminate the knowledge in the domain of civil engineering in general and role of Civil Engineers with respect to Sustainability Advancements in construction techniques in particular. The main objective of the course was to demonstrate the latest trends, case studies, field challenges and related remedies in different fields of civil engineering.

Scientists, Academicians, Research Scholars and Masters Students from academia of reputed NITs and IITs as well as scientific organizations participated in this online STC. The program was designed in such a way to achieve the set objectives of the course in stipulated period of five days and to make the participants benefitted at the end.

The STC was enlightened by Professors from esteemed universities like as IIT Ghandinagar, IIT Jammu, NIT’s India and IEST Shibpur.

Following themes were covered under this phase:

- Resource consumption
- Maximize resource reuse
- Use renewable or recyclable resources
- Protect the natural environment
- Create a healthy, non-toxic environment
- Low Impact Design
- Carbon Footprint Reduction
- Adaptive Reuse and Retrofitting:

Itinerary of the STC

First day:

On the first day, the Online STC was inaugurated by Dr Udit Jain, **NIT Nagpur**, as its chief guest. The organising team of the STC, Dr Navdeep Singh, Dr Shashi Kant Sharm, Dr Neelam Rani, and Dr Abhishek Sharma, were present. As the Inaugural Speaker, Dr Udit Jain, **NIT Nagpur**, was felicitated by the organising team.

Dr Shashi Kant Sharma briefly introduced the key objectives and themes of this Self-Sponsored One Week Online Short-Term Course. He also briefly introduced the eminent speakers and offered warm welcome to the participants. Dr Neelam Rani also graced the inauguration with

his valuable insights on the need of familiarising the young students, academicians, research scholars with the recent advancements and challenges faced in construction of civil engineering structures.

After the inauguration, Dr. Udit Jain, NIT Nagpur, delivered an expert lecture on the topic “Introducing Sustainability in traffic engineering.” He showcased the traffic engineering aims and objectives and principles adopted for managing traffic. It was elaborated that how traffic engineering could be made more efficient and sustainable. Measures like traffic monitoring, lane use, overbridge and under bridge design, design of alternate routed like bypass etc. were showcased in the talk. Efficiency and future aspect of each such measure was contemplated and proper suggestions and guidelines to improve them was communicated to the listeners.

In the afternoon session, Dr Arpita Saha, NIT Nagpur, India delivered lecture on the topic Road safety in urban area. She covered the topics like Infrastructure Design, Cycling Infrastructure, Pedestrian Safety, Traffic Management:, Public Transportation, Enforcement and Education:, Road User Behavior, Road Maintenance:, and Data Analysis and Monitoring. By addressing these key aspects comprehensively, urban areas can create safer road environments that prioritize the well-being and mobility of all road users

Second day:

In the first session of day two, Dr A.K. Roy, Associate Professor, NIT Hamirpur, India talked on the one of the most trending topics of wind engineering ‘effect of wind load on interference of building’ A lot of participants appreciated and acknowledged the efforts and the knowledge shared by Dr A.K. Roy, Associate Professor, NIT Hamirpur.

Understanding and accounting for the interference effect of wind on buildings is essential for ensuring the structural integrity, safety, and comfort of buildings in urban environments. By considering these factors during the design process, engineers and architects can create buildings that are resilient to the effects of wind and contribute to sustainable and livable urban spaces. He covered the basics of wind engineering along with Wind-Induced Pressures, Vortex Shedding, Corner and Edge Effects, Wind Loading Considerations, Wind-Induced Vibrations, Microclimate Considerations and Architectural Design Response.

In the second session of day two, Prof Udit Bhatiya, Indian Institute of Technology Gadhinar, India talked about the ‘Sustainability parameters for alternate binders. He brilliantly highlighted the concepts of alternate binding materials in cement concrete like fly ash, Silica fume, GGBFS etc. material and its impact on mechanical, micro structure and durability properties of concrete.

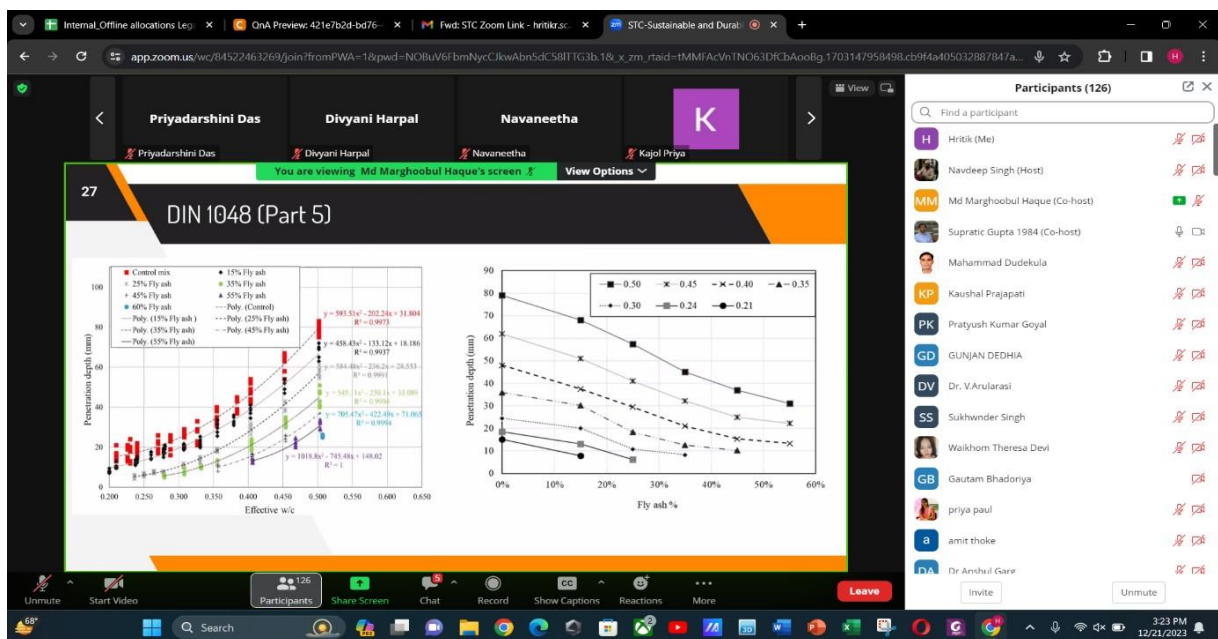
Third day:

In first session of day three was honoured by Prof Ankit Kathuria, **Indian Institute of Technology Jammu**, India who talked about the “Transportation Sustainability by integrating pedestrian flow and mass transport means”. Prof Ankit Kathuria explained the importance of integrating mass traffic movements with transportation means so as to introduce sustainability

in transportation. It was emphasized during the talk that how pedestrian movements could be encouraged by refurbishing the mass transportation means so that the use of individual traffic movements could be discouraged. The techniques of analysing traffic flow and providing alternatives to the flow in order to channelize it and regulate it in a sustainable manner was the gist of the talk.

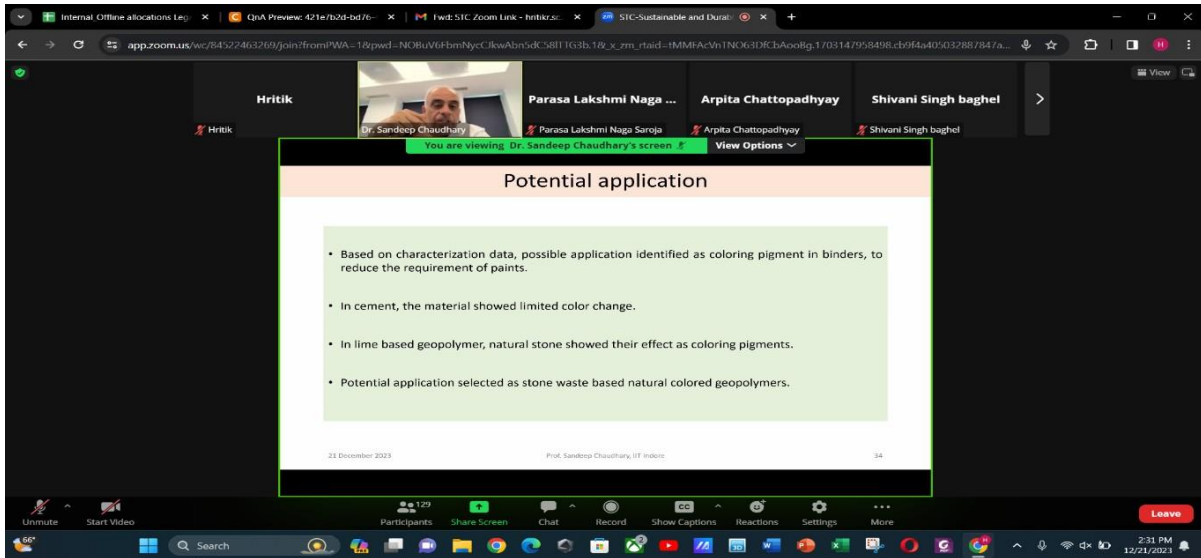
The second session was illuminated by the presence of an eminent speaker, Dr. Vimal Kumar, Assistant Professor NIT Hamirpur. Dr. Vimal Kumar delivered lecture on impact resistance and the resultant energy absorption capacity of prestressed concrete plates. Dr. Vimal Kumar covered flexure and tensile (splitting) dominant cracks, and shear cracks.

Prof Satyajit Mondal, Assistant Professor, NIT Patna delivered lecture on 'Recycled aggregate concrete composites. Prof Satyajit Mondal covered use of recycled aggregate in concrete and mortar various types of treatment for recycled aggregate composites for increasing the performance of recycled aggregate in concrete and mortar.

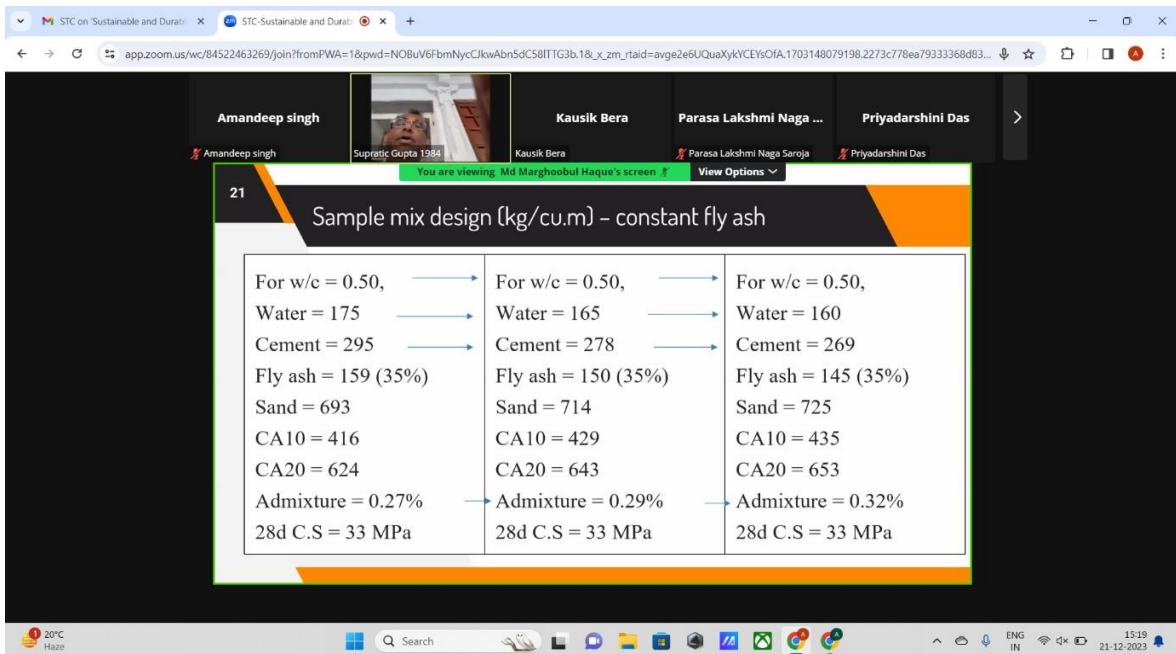


Fourth day:

In the first session of fourth day, Dr Kirti Mahajna, Assistant Professor, NIT Hamirpur delivered an expert talk on the topic "Long term measures for improving mass transportation means". It was highlighted during the talk that mass transportation engineering is the future of traffic engineering. Various mass transportation means were showcased, and their efficiencies and limitations were discussed. The capacity and future expansion capability of these means were also discussed. It was made aware of what measures could be adopted to make such means more sustainable with the increase in the population and traffic.



The second session marked the lecture on ‘Sustainability in concrete utilization and issue in mix design’ by Prof Supratic Gupta, Indian Institute of Technology Delhi, India. Prof Supratic Gupta delivered lecture on critical realm of sustainability within concrete utilization, with a specific focus on mix design. One of the primary concerns highlighted was the environmental impact linked to traditional cement production, notably its significant contribution to carbon dioxide emissions. To address this pressing issue, we explored various avenues, such as the integration of alternative materials like fly ash, slag, and silica fume, aiming to partially substitute cement and reduce its ecological footprints.



Fifth day:

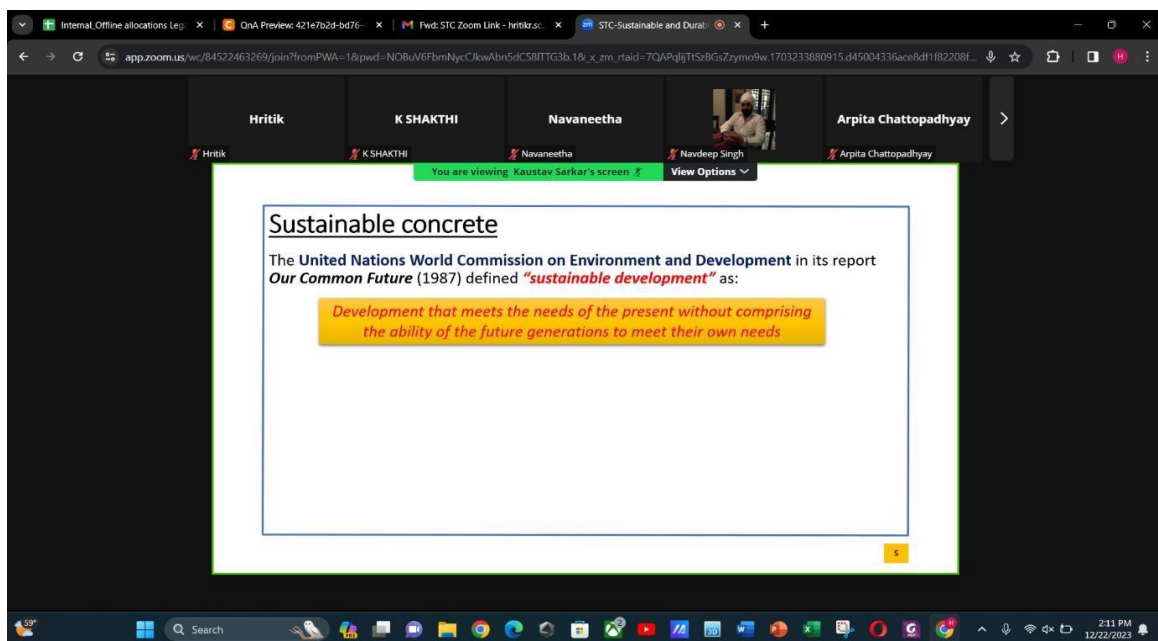
In the first session, Dr Sabyasachi Biswas, **NIT Durgapur**, delivered lecture on ‘Durability design for sustainable concrete structure’. Prof Kaustav Sarkar demonstrated the durable and sustainable concrete structures hinges on a holistic approach that considers material quality,

construction practices, and ongoing maintenance. It begins with selecting high-quality materials and employing precise mix designs to optimize strength while minimizing vulnerability to cracking and degradation. Thoughtful construction practices, including proper curing and reinforcement techniques, further bolster resilience. Protective coatings and sealants shield against environmental elements, enhancing longevity.

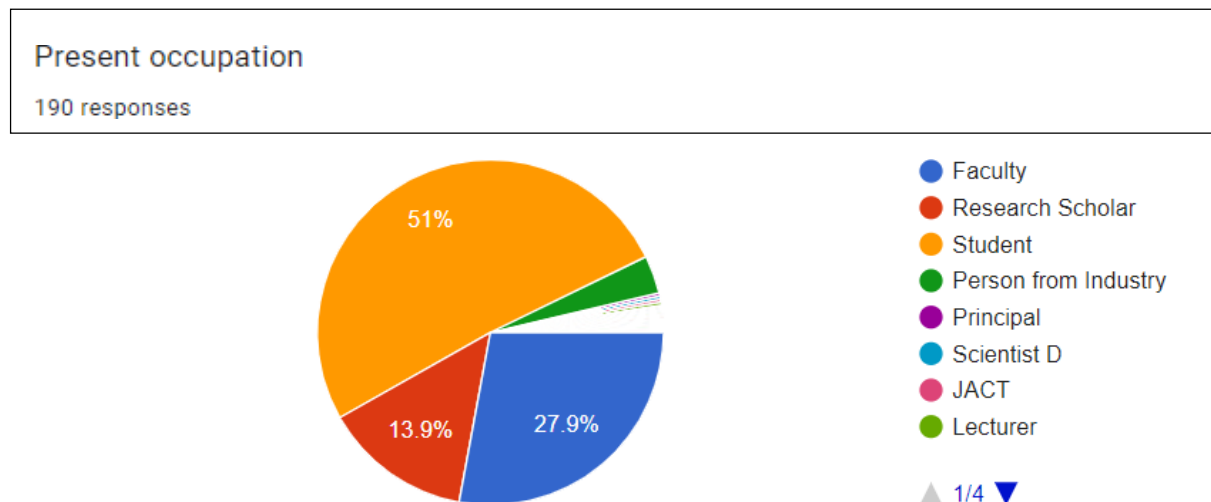
In the closing session Dr Bhaskar De, IEST Shibpur, India, delivered lecture on ‘Impact Of Canyon Design on Thermal Comfort In Warm Humid Cities’.

Participant’s Feedback

a) Background of the Participants



b) Feedback



Overall rating of the course

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190 responses

