

# TECHNO COLLEGE OF ENGINEERING AGARTALA

APPROVED BY AICTE AND AFFILIATED TO TRIPURA UNIVERSITY (A CENTRAL UNIVERSITY)

Volume 3:2024

# INSIGHT

A PERFECT INSIGHT OF WHAT'S GOING INSIDE



## NEWS LETTER OF CIVIL ENGINEERING & CIVIL ENGINEERING WITH COMPUTER APPLICATION



**Campus:** Maheshkhola, Anandanagar, Agartala, West Tripura, 799001



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# Institute Vision & Mission

## Vision Of TCEA

The Techno College of Engineering Agartala strives to develop institutional excellence in technical education and research to graduate talented, skilled and trained engineers, with admirable traditional cultural values to meet the technological and socioeconomic needs of our state, nation and the world at large.

## Mission Of TCEA

- To produce creative and technically strong engineers by providing high-quality technical education with emphasis on technical academic excellence, innovative research and development programmes with core human values.
- To continuously upgrade the faculty in curriculum design, teaching pedagogy, usage of ICT (Information and Communication Technology) and various processes pertaining to academics, research and University administration.
- Techno College of Engineering Agartala is committed to providing an education that combines rigorous academics with joy of discovery.
- The Institute encourages its community to develop a unique culture that instills responsibility and accountability in partnership with various stakeholders such as parents, society, business and education community.

## Vision & Mission of The Department

### Vision

To become a school of excellence that brings out civil engineers with high technical competencies and promotes high-end research to meet the current and future challenges in civil engineering.

### Mission

- To design curriculum, based on changing needs of stakeholders & provide excellence in delivery & assessment to ensure holistic development of civil engineering students.
- To develop professional attitude so that students may develop and sustain their skill as civil Engineers.
- To enhance research & consultancy resulting in solving problems related to civil engineering infrastructure as well as society at large.
- To mentor students for innovative thinking with relevance to entrepreneurship. Produce Engineer with scientific temperament and moral values in the field of civil Engineering.



## Message from Respected Principal Sir



Dear members of our esteemed institution, I am pleased to address you through our department's newsletter, a valuable platform that showcases the excellence and commitment that define our institution. In these dynamic times, it's vital that we reflect on our journey and the milestones we've achieved. Our institution has consistently strived for academic excellence, and I am proud of the dedication and hard work exhibited by our faculty, staff, and students. This newsletter is a testament to our unwavering commitment to knowledge, innovation, and community engagement. It brings to light the exceptional achievements of Civil Engineering Departments, the ground breaking research, and the talented individuals who make our institution stand out. As we look ahead, let us continue our pursuit of excellence in all our endeavors. Together, we shall embrace the challenges and opportunities that come our way, always guided by the principles of quality education, research, and service. Thank you for your dedication and commitment to our shared vision, and I anticipate another year of growth, success, and excellence.

**Dr. Dibakar Deb**  
**Principal Of Techno College Of Engineering Agartala**



## Message From Head Of The Department



"Welcome to the Department of Civil Engineering. Civil Engineers are the essential part of our society facilitating several services like provision of drinking water, transport facilities, and analysing soil stability to provide & establish various infrastructure facilities to live within an ambitious atmosphere. Therefore, the education for our next generation of Civil engineers is grouped into three-Teaching, Research and Services that will render the improved services to the society.

As the Head of the Department, I am proud to lead a team of dedicated and talented faculty and staff who are committed to provide our students with the best possible education and training in the field of civil engineering. Our mission is to produce graduates who are equipped with the strong technical knowledge, skills, industry ready and moral & ethical mindset to design and construct that will improve the quality of life and communities around the world.

Our department offers courses in both undergraduate and graduate programs in CE (CT), CE, & CECA respectively that aligned with the curricula designed by Tripura University. Our students also have access to state-of-the-art facilities and equipment's in civil engineering labs, which provide real-world experience in solving engineering problems. To learn more about our programs, research, and opportunities please do visit our department, and do not hesitate to contact us.

Thank you for your interest in the Department of Civil Engineering."

**Mr. Suman Paul**  
Assistant Professor & HOD, Department of Civil Engineering

## Message From Editorial Team Member



### ADVISIOR

DR. ARPAN LASKAR (ASSO. PROFESSOR OF CIVIL ENGG. DEPT., TCEA)  
MR. SUMAN PAUL (HOD OF CIVIL ENGG. DEPT. TECA)  
MR. DEEP CHAKRABORTY (ASST. PROF. OF CIVIL ENGG. DEPT. TECA)  
MR. PARTHA BHOWMIK (ASST. PROF. OF CIVIL ENGG. DEPT. TECA)

### EDITORIAL TEAM

RAJAT BHOWMIK (C.E.C.A 4TH YEAR)  
SOMNATH MAJUMDER (C.E. 3RD YEAR)  
SAYANIKA DATTA (C.E. 2ND YEAR)

We the student of CE and CECA department are extremely delighted to be a part of this newsletter. we have been able to discover new dimensions of our college and ourselves while curating this newsletter "INSIGHT". and we are looking forward to make this publish a huge success



## About Civil Engineering Department

Civil Engineering is a dynamic and essential field that focuses on designing, constructing, and maintaining the infrastructure that shapes our world. From roads, bridges, and buildings to water supply systems, dams, and transportation networks, civil engineers play a crucial role in improving quality of life and driving economic growth. The field combines creativity, technical knowledge, and problem-solving skills to create sustainable and resilient solutions for modern challenges like urbanization, climate change, and resource management. With diverse specializations such as structural, geotechnical, environmental, and transportation engineering, civil engineering offers rewarding career opportunities to build a better, safer, and more sustainable future.



## About Civil Engineering with Computer Application Department

Civil Engineering with Computer Applications integrates traditional civil engineering principles with advanced computational tools to revolutionize the design, analysis, and management of infrastructure. Using software like AutoCAD, Revit, STAAD.Pro, and BIM (Building Information Modeling), engineers can create precise designs, simulate structural behavior, and optimize construction processes. Computer applications enable efficient project management, cost estimation, and real-time collaboration, enhancing productivity and accuracy. This synergy of civil engineering and technology addresses modern challenges like smart cities, sustainable construction, and disaster-resistant structures. By leveraging data analytics, AI, and IoT, civil engineers can innovate and deliver smarter, safer, and more efficient infrastructure solutions for the future.



## Faculty Details



**Dr. Arpan Laskar**

Associate Professor, IQAC coordinator,  
Department of Civil Engineering.



**Dr. Rupali Roy**

Associate Professor,  
Department of Civil Engineering



**Mr. Avik Paul**

Assistant Professor,  
Department of Civil Engineering.



**Mr. Ranjit Das**

Assistant Professor,  
Department of Civil Engineering.



**Dr. Mithun Ghosh**

Associate Professor,  
Department of Civil Engineering.



**Mr. Suman Paul**

Assistant Professor,  
Department of Civil Engineering



**Mr. Deep Chakraborty**

Assistant Professor,  
Department of Civil Engineering



**Ms. Srila Dey**

Assistant Professor,  
Department of Civil Engineering



**Mr. Ranjit Chakma**

Assistant Professor,  
Department of Civil Engineering



**Mr. Rahul Ghosh**

Assistant Professor,  
Department of Civil Engineering



**Mr. Diptanu Shil**

Lecturer,  
Department of Civil Engineering



**Mr. Partha Bhowmik**

Assistant Professor,  
Department of Civil Engineering

## Best Department Award



Civil Engineering Department has won the Best Department Award in 2024. This achievement is a testament to the hard work, dedication, and teamwork of our incredible students and faculty. A huge thank you to everyone who contributed to this success. Your passion and commitment truly made a difference.

This award acknowledges the department's relentless pursuit of excellence in education, research, and professional development. It reflects the outstanding quality of the programs offered, the dedication of the faculty members, and the hard work of the students. Such recognition reinforces the department's position as a leader in shaping the future of civil engineering. Winning the "Best Department" award is a moment of immense pride and joy, not only for the faculty and staff but also for the students and alumni who have contributed to this milestone. This achievement is a testament to the department's commitment to academic excellence, innovative research, industry engagement, and societal contributions.





# **Technical Write-up From Faculty Members**

# AI in Civil Engineering: Revolutionizing Infrastructure

**Mrs. Srila Dey**  
Assistant Professor,  
Department of Civil Engineering

Artificial Intelligence (AI) is reshaping civil engineering, making construction smarter, safer, and more efficient. AI-powered Building Information Modeling (BIM) enhances design precision, reducing waste and costs. Machine learning algorithms predict structural failures, enabling proactive maintenance of bridges and buildings. Drones and autonomous robots streamline construction, improving accuracy and safety. AI-driven project management tools optimize scheduling, budgeting, and resource allocation. Furthermore, AI fosters sustainable infrastructure, minimizing environmental impact. As AI continues to evolve, it is paving the way for a more resilient and intelligent built environment.



# Innovative Directions in Civil Engineering

**Mr. Rahul Ghosh**

Assistant Professor,  
Department of Civil Engineering

Civil engineering continues to evolve, integrating cutting-edge research and digital advancements. Below are several innovative areas driving the field forward:

## 1. 3D Printing in Construction

Rapid advancements in additive manufacturing have led to 3D-printed houses and infrastructure components. This technology offers quicker construction times, reduced material wastage, and design flexibility.

## 2. Self-Healing Materials

Self-healing concrete and asphalt contain microcapsules or bacteria that seal cracks automatically. This innovation improves structural longevity and lowers maintenance costs.

## 3. Smart Infrastructure and IoT

Sensors and Internet of Things (IoT) devices embedded in roads, bridges, and buildings provide real-time performance data. Such monitoring aids in proactive maintenance and enhances public safety.

## 4. Carbon-Negative Concrete

Researchers are exploring carbon-capturing cement, which absorbs more CO<sub>2</sub> during its lifecycle than it emits. This approach addresses the environmental impact of traditional cement production.

## 5. Geopolymer Binders

An alternative to conventional Portland cement, geopolymers rely on industrial by-products like fly ash or slag. They significantly reduce carbon emissions while maintaining excellent mechanical properties.

## 6. Digital Twins and BIM

Virtual replicas, or "digital twins," of infrastructure projects coupled with Building Information Modeling (BIM) enable predictive maintenance. They also streamline design, resource allocation, and lifecycle management.

## 7. AI and Machine Learning

Advanced analytics assist in predicting structural behavior, optimizing designs, and identifying potential failures early. AI-driven risk assessments enhance safety and productivity.

Embracing these innovative solutions will help civil engineers create resilient, sustainable, and intelligent infrastructure for future generations



# Unprecedented Flood in Tripura - Reason Behind It

**Dr. Mithun Ghosh**

Associate Professor  
Department of Civil Engineering

In the recent past, Tripura experienced devastating floods that caused immense destruction, particularly in August 2024. The primary reasons behind these floods can be attributed to a combination of natural and human-induced factors.

A combination of heavy rainfall, human activities and inadequate infrastructure primarily caused the devastating floods in Tripura in the recent past.

- **Heavy Rainfall:** The most immediate cause of the floods was the unusually high and prolonged monsoon rainfall, which overwhelmed the region's rivers, including the Gomti and the Manu. These rivers swelled beyond their banks, leading to widespread flooding in towns and rural areas. The excessive rainfall was far above the typical monsoon levels, triggering the floodwaters to inundate low-lying regions.
- **Climate Change:** One of the underlying factors behind the extreme weather was climate change, which has been altering weather patterns across the world. In the case of Tripura, this has manifested in more intense and erratic rainfall. The increase in rainfall intensity, linked to rising global temperatures, has exacerbated the flood risk.
- **Deforestation and Soil Erosion:** Tripura has seen significant deforestation over the years. Forests, especially in the hilly areas, play a crucial role in absorbing rainfall and stabilizing the soil. Without this natural barrier, the land became more prone to soil erosion and landslides, further worsening the impact of the floods.
- **Urbanization and Poor Drainage Systems:** Unplanned urban growth, especially in flood-prone areas, has led to encroachment on floodplains. In addition, inadequate drainage systems in both urban and rural areas made it difficult for water to flow out efficiently, leading to waterlogging and prolonged flooding.



# Transforming Civil Engineering Through AI

**Dr. Arpan Laskar**

Associate Professor,

Department of Civil Engineering

Artificial Intelligence (AI) is altering the civil engineering field by improving efficiency, precision, and sustainability. AI-driven solutions are changing the industry across all phases, from planning and design to construction and maintenance.

A significant use of AI in civil engineering is in structural health monitoring, where machine learning techniques evaluate data from sensors to forecast failures in bridges, dams, and buildings, ensuring that maintenance is performed on time. AI-enhanced geotechnical analysis improves soil testing and site selection, lowering risks associated with construction.

In the realm of transportation engineering, AI-enabled traffic management systems optimize roadway networks by assessing real-time data, thereby enhancing mobility and decreasing congestion. Likewise, AI improves construction management by automating tasks such as scheduling, cost estimation, and quality assurance using predictive analytics and robotic automation.

The combination of Generative Design and AI empowers engineers to create optimized structures by examining numerous design alternatives with respect to material efficiency, load-bearing capacity, and environmental considerations. AI-driven Building Information Modeling (BIM) also simplifies project planning and collaboration, reducing mistakes and enhancing sustainability.

Moreover, AI is essential in disaster management, as it forecasts earthquakes, floods, and landslides, facilitating proactive planning and risk reduction. The incorporation of AI in civil engineering not only enhances productivity but also encourages environmentally friendly solutions, making infrastructure development more intelligent and resilient.

As advancements continue, AI will persist in reshaping civil engineering, making it increasingly innovative, cost-efficient, and prepared for the future.



# An Overview of Transportation Engineering

**Dr. Rupali Roy**  
Associate Professor  
Department of Civil Engineering

Transportation engineering is the application of modern technology and scientific principles to the design, development and maintenance of transportation systems. The field of transportation engineering uses the latest developments in transportation, such as autonomous vehicles and transportation management systems, and uses them to create the most efficient and effective systems possible for various locales. It is a broad field that can apply to work with roadways, waterways, railways and other projects. Transportation engineers develop faster, safer and more efficient means of transport system.

The Latin word *transportare* means carry across. A facility consisting of the means and equipment necessary for the movement of passengers or goods. At its most basic, the term "transportation system" is used to refer to the equipment and logistics of transporting passengers and goods. It covers movement by all forms of transport, from cars and buses to boats, aircraft and even space travel. Transportation systems are employed in troop movement logistics and planning, as well as in running the local school bus service.

Transportation engineering deals with the application of technology and scientific principles to transportation systems. It discusses the tasks of transportation engineers which include planning, designing, constructing, maintaining, and operating transportation facilities to provide for the safe, rapid, comfortable, convenient, economical, and environmentally safe movement of people and goods. Transportation contributes to the economic, industrial, social and cultural development of any country. It is the vital for the economic development of any region since every commodity produced whether it is food, polythene, industrial products or medicine needs transport at all stages from production to distribution.



# Technical Issue in Designing & Planing

**Mr. Diptanu Shil**

Lecturer,  
Department of Civil Engineering

I am Diptanu Shil, a civil engineering enthusiast with a passion for designing and planning buildings. In my journey of civil engineering, I have encountered several technical issues that I believe are important to share with you.

When it comes to designing and planning a building, there are several key technical issues that must be addressed. Ensuring structural integrity, optimizing space, incorporating sustainability principles, and complying with regulations are just a few of the challenges that civil engineers face.

In addition, civil engineering drawing and planning require a high level of accuracy, precision, scalability, clarity, and collaboration. These key points are essential in ensuring that the design is translated correctly into reality and that all stakeholders are working towards the same goal.

By prioritizing these factors in civil engineering drawing and planning, we can create buildings that are not only safe and functional but also sustainable and efficient. I hope that by sharing these insights, we can all work towards creating a better built environment for future generations.

Thank you for taking the time to read this write-up. If you have any questions or would like to discuss these topics further, please feel free to reach out to me.



# Prospect of Implementing Intelligent Transportation System (ITS) in Different Road Networks of Agartala City

Mr. Deep Chakraborty

Assistant Professor

Department of Civil Engineering

An Intelligent Transportation System (ITS) is an advanced application designed to improve transport services and traffic management. It enhances user awareness, ensuring safer, more efficient, and smarter use of transport networks.

## Need for ITS in Agartala

- As the capital of Tripura, Agartala is rapidly transforming into a smart city with several road development projects underway.
- With increasing traffic volume and limited road networks, the fixed signaling system has become a major cause of congestion.
- The complexity of road networks and diverse vehicle classes necessitate a sustainable system that ensures both safety and efficiency.

## Solution: Traffic Actuated Signal System (TASS)

The implementation of Traffic Actuated Signal System (TASS) can significantly minimize congestion. It comprises three main components:

- Detector** – Detects the presence and volume of vehicles on the road.
- Controller Unit** – Processes data from the detector and determines the frequency and duration of signal cycles.
- Signal Heads (Traffic Lights)** – Visually communicate traffic instructions using three colors: **Red – Stop | Yellow – Prepare to stop | Green – Proceed**

## How TASS Works:

- The detector senses vehicle presence and traffic volume.
- The controller processes the data and adjusts signal timing accordingly.
- The signal heads (traffic lights) display appropriate signals based on real-time traffic conditions.

## Expected Benefits

Reduced traffic congestion | Improved road safety

Smarter traffic flow management | Efficient use of road networks

By integrating ITS and TASS, Agartala can move towards a smoother, safer, and more sustainable transportation system, ensuring long-term urban mobility solutions.



# Importance of Seismic Analysis

## Design of Structural & Non-Structural Elements

**Mr. Suman Paul**

Assistant Professor

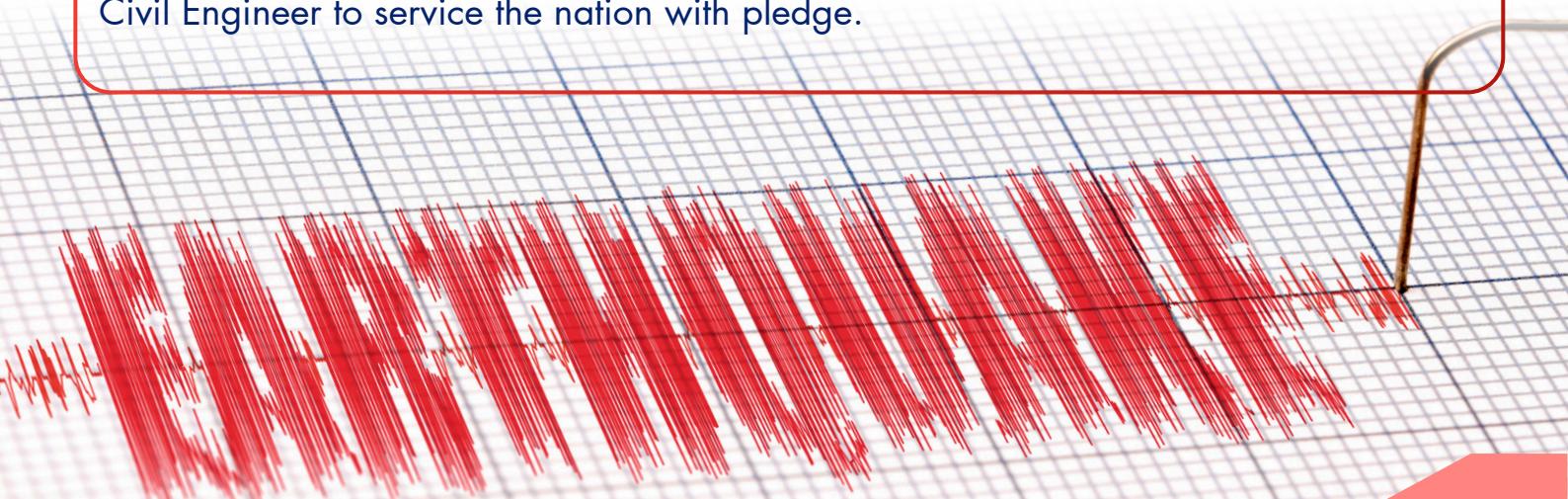
HOD, Civil Engineering Department

At first I want to thank the advisory team and editorial team of our INSIGHT 3.0 for putting such effort to accomplish the newsletter. I also feel privilege to share my thoughts through such scope.

Concrete is the second largest useful material in the world after water which means huge construction is going on around of us. It is very important for us as a Civil Engineer to follow the proper analysis and design process maintaining IS codes and by laws. Almost all the structure resting on the soil that requires a minimum bearing capacity to withstand the structural load. The only soil that looks very simple but full of variability in multiple direction and the plate movements that makes the soil strata vulnerable from seismicity point of view that requires the structure to be designed as earthquake resistance. From some famous quote- "Earthquake don't kill the people, buildings do.", so we must construct the structure that it could service the humanity with durable enough instead of losing the life. Especially for our state of Tripura is under seismic zone V as per the seismic zoning map of India, so it is necessary for all the important structure should go through a definite seismic analysis & design check.

Unlike structural elements, Non-structural elements of a building are not a part of the main load-resisting system. Therefore, these are often neglected from the structural design point of view. Performance in the past earthquake clearly pointed out that in view of the absence or inadequacy of design provisions for non-structural elements and their attachments it has resulted in poor performance of several life line buildings. In India too, non-structural damages are often observed in the earthquakes but are overlooked owing to the obvious attention to the huge loss of human lives and structural damage. Moreover, provisions relating to non-structural element in Indian seismic codes (IS 1893) are inadequate or practically non-existent that needs immediate attention to formulate the criteria for this.

At the end I want to congratulate all my beloved students to become a responsible Civil Engineer to service the nation with pledge.



# Cob as a Sustainable Building Material

Mr. Ranjit Das  
Assistant Professor  
Department of Civil Engineering

## The Significance of Soil in Construction

**Ancient Construction Material:** Soil has been a fundamental construction material since ancient times, with historical records from Indus Valley, China, Mesopotamia, and the Tigris-Euphrates regions showcasing its usage.

**Iconic Earth Structures:** Examples include the Great Wall of China, Basgo Fort (India), Alhambra Fortress (Spain), and Horyuji Temple (Japan).

## Types of Earthen Construction

1. Rammed Earth – Earth is compacted in layers to form strong walls.
2. Cob Construction – Earth mixed with fibers is shaped into solid walls.
3. Adobe – Sun-dried bricks made from earth and straw.
4. Compressed Earth Blocks – Earth blocks are mechanically pressed for strength.

## Cob Construction: A Timeless Technique

- **Method:** Dampened earth balls mixed with fibers are stacked to create a durable wall structure.
- **Advantages:** Simple to construct | Flexible in design  
Cost-effective & sustainable | Excellent thermal insulation

## Seismic Vulnerability & Strengthening

- Challenges: Earthen structures, including cob construction, are prone to seismic and lateral forces due to their low shear and tensile strength.
- Seismic Damage: Past studies indicate shrinkage cracks and failure planes that make cob structures vulnerable to out-of-plane damage during earthquakes.
- Flexural Strength:
  - Cob has lower flexural strength than concrete or steel.
  - However, its natural flexibility distributes stress, reducing the risk of cracks and deformation.
  - Reinforcement with bamboo or timber enhances earthquake resistance.

## Conclusion

Despite certain limitations, cob construction remains a sustainable, cost-effective, and aesthetically appealing building method. With modern reinforcements and research-driven improvements, cob structures can be made more resilient against seismic activities, ensuring safe and eco-friendly construction for the future.



# Advantages of Conventional Design Methods Over AI-Powered Design Methods

Mr. Partha Bhowmik

Assistant Professor

Department of Civil Engineering

While AI-powered design methods are revolutionizing the field of civil engineering, conventional design methods still hold significant advantages in certain aspects. Here's a detailed look at why traditional approaches remain relevant:

## 1. Simplicity and Transparency

Conventional design methods rely on well-established principles, formulas, and manual calculations that are easy to understand and verify. Engineers can clearly trace each step of the design process, ensuring transparency and accountability. In contrast, AI-powered methods often operate as "black boxes," making it difficult to interpret how decisions are made.

## 2. Cost-Effectiveness for Small Projects

For smaller-scale projects, conventional methods are often more cost-effective. They do not require expensive software licenses, high computational power, or specialized training, which are typically needed for AI-based tools. This makes traditional methods more accessible for small firms or projects with limited budgets.

## 3. Flexibility and Adaptability

Conventional methods allow engineers to adapt designs on the fly based on site conditions, client requirements, or unforeseen challenges. This hands-on approach provides greater flexibility compared to AI systems, which may require extensive reprogramming or retraining to accommodate changes.

## 4. Human Intuition and Creativity

Civil engineering often requires creative problem-solving and intuitive decision-making, especially in unique or complex projects. Conventional methods rely on the experience and judgment of engineers, enabling innovative solutions that AI may not yet replicate effectively.

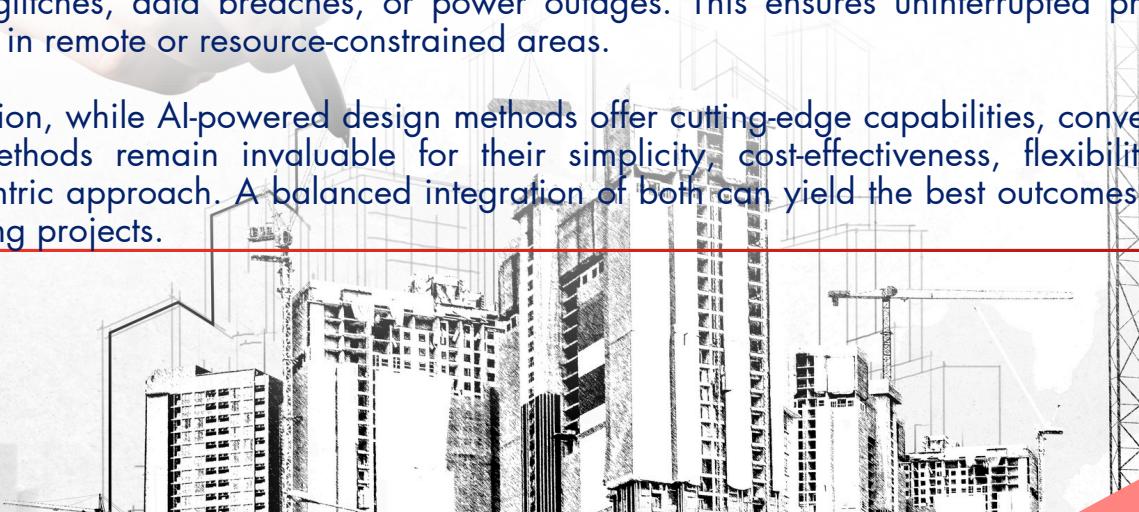
## 5. Reliability and Proven Track Record

Traditional design methods have been tested and refined over decades, providing a reliable framework for engineers. Their proven track record instills confidence in clients and stakeholders, whereas AI-powered methods are still evolving and may lack the same level of trust.

## 6. Reduced Dependency on Technology

Conventional methods do not rely on advanced technology, making them less vulnerable to software glitches, data breaches, or power outages. This ensures uninterrupted progress, especially in remote or resource-constrained areas.

In conclusion, while AI-powered design methods offer cutting-edge capabilities, conventional design methods remain invaluable for their simplicity, cost-effectiveness, flexibility, and human-centric approach. A balanced integration of both can yield the best outcomes in civil engineering projects.



# Research & Activity

## Technical Talk on Disaster Management



A technical seminar was organized by the Department of Civil Engineering & CECA and the Indian Building Congress (IBC), Tripura Centre on "Disaster Management" on February 27, 2024. The program was completed successfully with the gracious presence of dignitaries and experts from different areas, and the speech of the speaker surely enriched the knowledge of our students.

The primary goal of technical talk is to disseminate knowledge, collaboration, and advance the understanding of the subject matter. It often involves sharing and exchanging knowledge, ideas, and information about complex topics, often using technical jargon specific to the particular domain.

Overall, technical talks play a crucial role in the advancement of different industries, encouraging innovation, and promoting continuous learning among professionals. They help professionals stay updated with the latest developments and trends, which is essential in today's rapidly evolving technological landscape.



# Research & Activity

## Technical talk on Full Depth Reclamation

 MoE's  
INNOVATION CELL  
(GOVERNMENT OF INDIA)

 AICTE  
AN AUTONOMOUS  
EDUCATIONAL  
AGENCY

 GOVERNMENT OF  
INDIA

 TECHNO COLLEGE OF ENGINEERING AGARTALA  
An Engineering College Affiliated to Tripura University & Approved by AICTE, MHRD, Govt of India

**Department of Civil Engineering & Civil Engineering with Computer Application**  
In association with  
**IIC TCEA**  
is going to organize a  
**TECHNICAL TALK**  
on  
Full Depth Reclamation Technique: A Sustainable Pavement Rehabilitation & Permeable Pavement: A sustainable solution for pavement

 **SPEAKER**  
Dr. Partha Pratim Sarkar  
Professor, Department of Civil Engineering, NIT Agartala

November 14, 2024      New Seminar Hall, TCEA



The Department of Civil Engineering and CECA, TCEA in collaboration with Institution's Innovation Council TCEA recently hosted an insightful technical talk, which was an incredible opportunity for students and faculty alike to deepen their understanding of the latest industry trends and innovations. The session featured Dr. Partha Pratim Sarkar, Professor, NIT Agartala, a renowned expert in the field, who shared valuable insights into

1. Full Depth Reclamation Technique: A Sustainable Pavement Rehabilitation
2. Permeable Pavement: A sustainable solution for pavement.

A big thank you to everyone who participated and made this event a success! Such enriching experiences are what drive our department forward, inspiring future engineers to push boundaries and innovate



# Research & Activity

## Working Model Competition : Hydrology & Water Resources Engineering



Model Competitions are a thrilling and educational part of civil engineering events, where students, professionals, and enthusiasts come together to demonstrate their skills, creativity, and technical knowledge. These competitions provide participants with the opportunity to design, build, and test various models.

The goal is not only to solve engineering problems but also to innovate and improve existing solutions, while working within specified parameters and constraints. Civil engineering is a multifaceted discipline that includes designing and constructing infrastructure like buildings, bridges, roads, and water systems.

A civil model competition serves as a platform to replicate these processes on a smaller scale through model-building, testing, and evaluation. Whether it's through building bridges, concrete canoes, or sustainable infrastructure, these competitions foster a spirit of collaboration, ingenuity, and excellence in the field of civil engineering.



# Research & Activity

## Working Model Competition : Design Dash 1.0



Model Competitions are a thrilling and educational part of civil engineering events, where students, professionals, and enthusiasts come together to demonstrate their skills, creativity, and technical knowledge. These competitions provide participants with the opportunity to design, build, and test various models.

The goal is not only to solve engineering problems but also to innovate and improve existing solutions, while working within specified parameters and constraints. Civil engineering is a multifaceted discipline that includes designing and constructing infrastructure like buildings, bridges, roads, and water systems. A civil model competition serves as a platform to replicate these processes on a smaller scale through model-building, testing, and evaluation. Whether it's through building bridges, concrete canoes, or sustainable infrastructure, these competitions foster a spirit of collaboration, ingenuity, and excellence in the field of civil engineering.



# Research & Activity

## Industrial Visits: Water Treatment Plant

**TECHNO COLLEGE OF ENGINEERING AGARTALA**  
MAHESHKHOLA, AGARTALA, TRIPURA(W)

**DEPARTMENT OF CIVIL ENGINEERING & CIVIL ENGINEERING  
WITH COMPUTER APPLICATION**

### Industrial Visit

At WATER TREATMENT PLANT

AGARTALA  
PLACE: PANCHAMUKH,

DATE - 29/02/2024  
DAY - THURSDAY



An Industrial Visit at Water Treatment Plant (WTP), Panchamukh, Agartala All 6th semester students of CE & CECA visited the WATER TREATMENT PLANT (WTP) at Panchamukh, Agartala as a part of an Industrial Visit which was planned by the Department of Civil Engineering and Civil Engineering with Computer Application, Techno College of Engineering Agartala

The programme was led by Asst. Prof. Ranjit Das and Asst. Prof. Ranjit Chakma The main objective of the visit was to enhance the students' theoretical knowledge of water treatment by showing them the practical operation of each treatment unit of WTP at Panchamukh, Agartala

The main objective of the visits was to enhance the student's theoretical knowledge of water treatment plant by showing them the practical knowledge. Students can learn about safety protocols and practices used in the industry, promoting safety consciousness in their future careers.



# Research & Activity

## Industrial Visit: Ekalavya Model School



An Industrial visit at the construction site of Ekalavya Model Residential School. On 12th September. From exploring construction sites to learning about the latest innovations in infrastructure development, it was an eye- opening experience for all.

Visiting industrial sites allows students to witness sustainable construction practices and the importance of minimizing environmental impacts. Seeing successful civil engineering projects in action can motivate and inspire students to excel in their studies and pursue careers in the field. Overall, industrial visits enhance a civil engineering student's educational experience and provide valuable insights.



# Research & Activity

## Industrial Visits: TIUT Campus

### Techno College of Engineering Agartala

Maheskala, Agartala, Tripura (W)



Department of Civil Engineering and Civil Engineering  
with Computer Application  
Industrial visit

At

TIUT under construction building

On 24th May 2024



A huge shoutout to the students of 4th semester, diploma in Civil Engineering with Construction Technology, Techno College of Engineering Agartala for an unforgettable industrial visit! From exploring construction sites to learning about the latest innovations in infrastructure development, it was an eye-opening experience for all.

Visiting industrial sites allows students to witness sustainable construction practices and the importance of minimizing environmental impacts. Seeing successful civil engineering projects in action can motivate and inspire students to excel in their studies and pursue careers in the field.



# Research & Activity

## Cadorev 3.0 : 2D Model Making Competition



Civil Engineering department successfully hosted CADOREV 3.0, A CAD competition using AutoCAD Software, on 11th November.

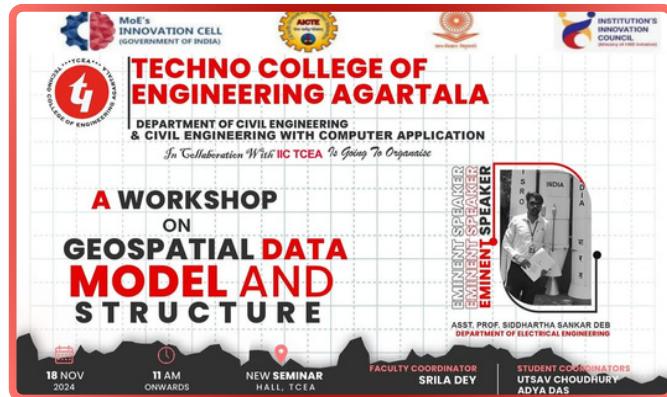
The event culminated in a prize distribution ceremony, honoring the winners. Abhoy Deb (1st) Rijan Saraka (2nd) Sudipta Deb (3rd) We congratulate the winners and appreciate the participation of all students. We extend our gratitude to all Participants, Judges, and Organizers for their tireless efforts in making CADOREV 3.0 a resounding success. This competition has not only fostered technical expertise but also promoted healthy competition and teamwork.

CADOREV 3.0 demonstrated the exceptional talent of our students, and we look forward to hosting future editions of CADOREV, continuing to provide a platform for students to showcase their skills and push the boundaries of innovation.



# Research & Activity

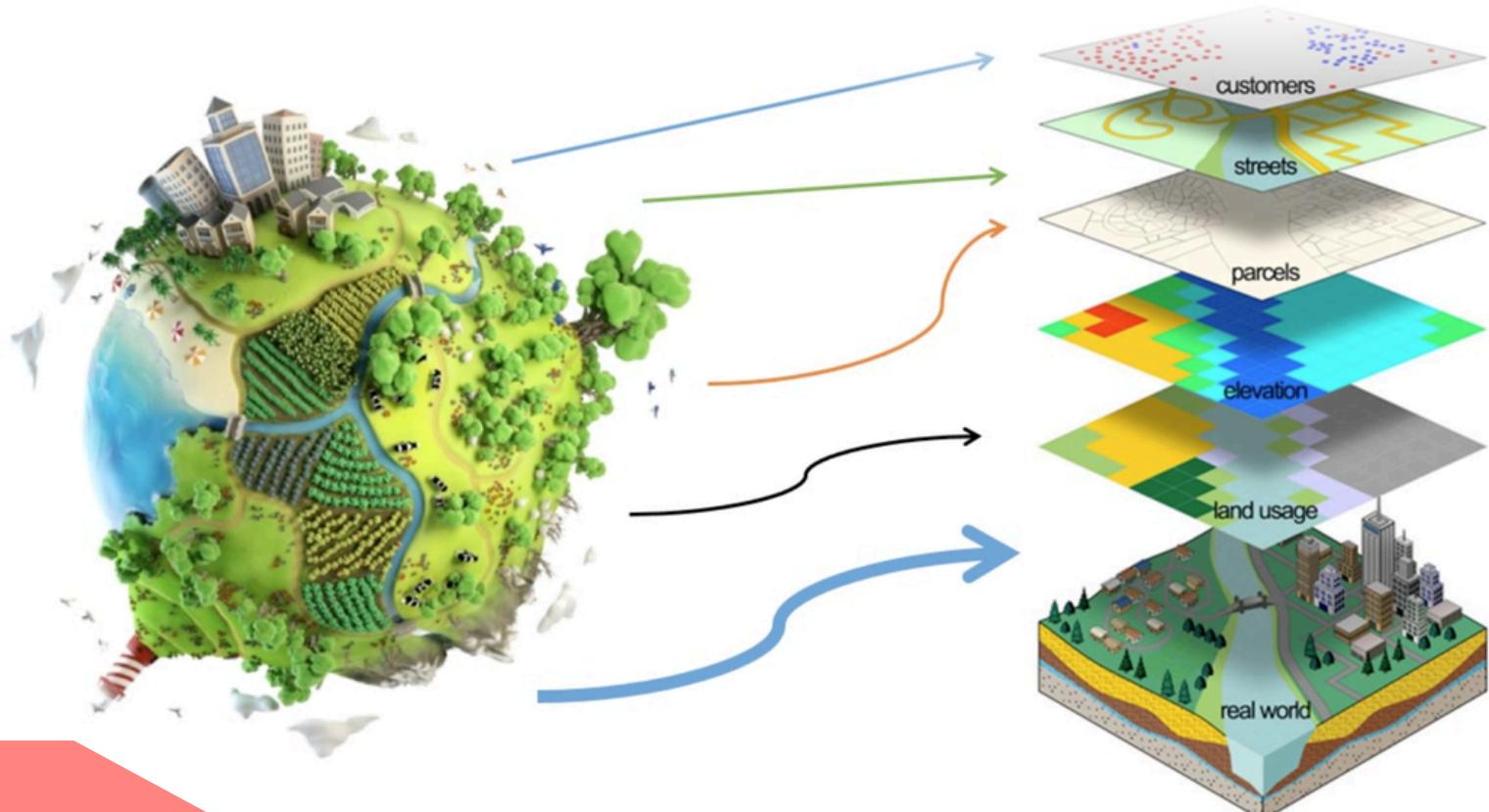
## Workshop: Geospatial Data Modeling & Structure



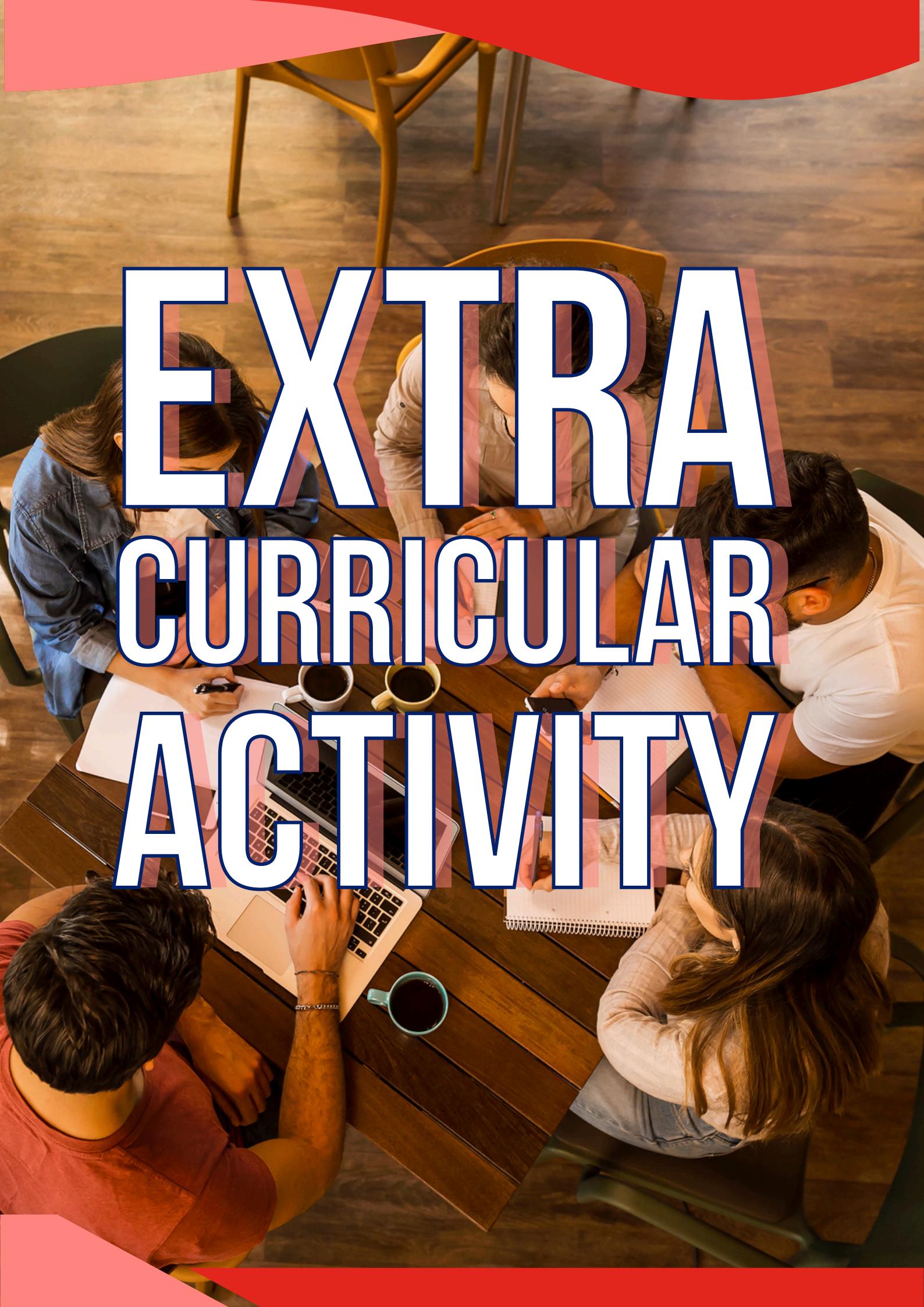
The Department of Civil Engineering and CECA, TCEA in collaboration with iictcea is going to organize a workshop on "Geospatial Data Model and Structure" on 18th November, 2024, to introduce participants to the fundamentals of geospatial data management.

This hands-on workshop will explore the concepts, techniques, and tools necessary for designing and implementing robust geospatial data models. A Geospatial Data Model is a conceptual framework used to represent, store, and manage spatial data in a structured way.

This type of data is crucial for understanding and analyzing the physical locations, shapes, and relationships of objects in the real world. Geospatial data refers to information that is tied to specific geographic locations and can describe various phenomena, such as land features, infrastructure, and even environmental conditions



# EXTRA CURRICULAR ACTIVITY



## Drawing Competition



Art is one of the most powerful forms of expression, a universal language that transcends barriers of age, culture, and language. Whether it's through a pencil sketch, a detailed painting, or a digital masterpiece, art allows us to share our unique perspectives, emotions, and stories. If you've ever found yourself moved by a piece of art, you know just how powerful it can be. Participating in this drawing competition not only gives you a chance to win amazing prizes but also offers a platform to express your creativity and showcase your skills. Whether you are looking to gain experience, share your passion for art with others, or simply enjoy the process of creating, this competition provides a great opportunity to be a part of a larger community of artists. Your artwork will be appreciated and admired by fellow artists, art lovers, and our readers. We believe that art has the power to inspire and connect people, and this competition is a perfect way to celebrate the creativity within our community. No matter your background or skill level, this competition invites you to explore your artistic potential and share your voice through your drawings.

## Debate Competition



A Platform for Intellectual Exchange and Critical Thinking. A debate competition is an organized event where participants present and defend opposing viewpoints on a given topic. It is a platform that fosters intellectual engagement, encourages critical thinking, and hones public speaking skills.

With the advent of technology, debates have extended beyond physical stages to virtual platforms. Online debate competitions have gained popularity, enabling participants from across the globe to engage in intellectual discourse.

A debate competition is much more than a contest; it is a transformative experience that sharpens minds and nurtures essential life skills. By fostering critical thinking, communication, and collaboration, debates prepare individuals to navigate and contribute meaningfully to an increasingly complex and interconnected world.

# Bridge the Gap: An Inter-College Quiz Competition



Quiz competitions serve several important purposes. Firstly, they encourage and promote a culture of learning and knowledge-seeking. Individuals are motivated to expand their knowledge across various subjects by participating in quizzes. Secondly, quiz competitions help enhance memory, critical thinking, and problem-solving skills. Participants are challenged to recall and apply information quickly, improving their cognitive abilities. Furthermore, quiz competitions foster healthy competition, teamwork, and sportsmanship.

A debate competition is much more than a contest; it is a transformative experience that sharpens minds and nurtures essential life skills. Debates prepare individuals to navigate and contribute meaningfully to an increasingly complex and interconnected world by fostering critical thinking, communication, and collaboration.

## Motivational session : Idea to Impact



A motivational session is a transformative experience designed to inspire individuals to unlock their potential, overcome challenges, and achieve personal and professional goals. These sessions are often led by skilled speakers or coaches who use real-life experiences, powerful anecdotes, and actionable insights to spark enthusiasm and drive in their audience. The primary aim of a motivational session is to uplift and empower participants, helping them cultivate a positive mindset and take decisive steps toward their aspirations. Whether aimed at students, professionals, or individuals from diverse backgrounds, these sessions provide tools to foster self-confidence, resilience, and a sense of purpose. They inspire participants to turn challenges into opportunities, focus on their strengths, and work consistently toward their goals. Through inspiration and guidance, these sessions plant the seeds of transformation, motivating participants to aim higher and achieve more.



# CELEBRATION OF IMPORTANT DAYS

# World Environment Day



World Environment Day focuses on a specific theme that highlights a significant environmental concern. Themes in the past have covered topics like climate change, biodiversity loss, plastic pollution, sustainable consumption, and renewable energy, among others. The chosen theme serves as a call to action, inspiring people to take steps towards positive environmental change. World Environment Day is a global platform that encourages individuals to make small changes in their daily lives, like reducing plastic usage, conserving water, and adopting eco-friendly practices, with the belief that collective efforts can lead to significant positive impacts on the environment. In World Environment Day is a vital occasion that emphasizes the importance of environmental protection and sustainable practices. It serves as a reminder of our responsibility to safeguard the planet for future generations and fosters a sense of unity and shared responsibility towards the preservation of our natural resources

## Independence day



India's Independence Day is a significant and historic event in the country's history. On August 15, 1947, India achieved independence from British rule after nearly 200 years of colonization. The struggle for freedom was led by various prominent leaders like Mahatma Gandhi, Jawaharlal Nehru, Sardar Vallabhbhai Patel, and many others, who advocated non-violent civil disobedience and peaceful protests to attain independence. On the eve of Independence Day, the Prime Minister of India addresses the nation from the Red Fort in New Delhi, reflecting on the country's progress, achievements, and future goals. Flag hoisting ceremonies take place at various government and public buildings, and people from all walks of life participate in the celebrations. Independence Day is a time for patriotic fervor and unity, with cultural programs, parades, and various activities taking place.

# Teachers Day



Teacher's Day is not just an opportunity to express thanks to educators but also to reflect on the immense impact they have on society. Teachers are not only responsible for imparting knowledge but also for shaping the character, values, and attitudes of their students. Their dedication influences all aspects of life — personal, professional, and societal. On this day, we are reminded of how crucial teachers are in fostering the intellectual and emotional growth of children and adults alike. In many cultures, Teacher's Day is marked by ceremonies, performances, and messages of appreciation. Students often present teachers with cards, flowers, and gifts as a gesture of thanks. These expressions of gratitude serve to remind teachers of the respect and admiration they hold in the hearts of their students.

## Enlightenment: Pre Dewali Celebration



Diwali is a significant cultural and religious festival for our society. Celebrating it in college allows them to uphold and share their cultural heritage, fostering a sense of belonging and pride in their traditions. Diwali celebrations bring a festive atmosphere to the college campus, creating a sense of joy and unity among students and staff. Diwali celebrations can include educational components, such as workshops or presentations, where students can learn about the history, mythology, and cultural aspects of the festival. It provides an opportunity for students to come together, build connections, and strengthen their sense of community within the college. Diwali is often associated with values like compassion, generosity, and the triumph of good over evil. Celebrating it in college can reinforce these values among students.



# SOCIAL ACTIVITY

# Blood Donation



TCEA is happy to share glimpses of the impactful Blood Donation campaign organized by Techno College of Engineering Agartala in collaboration with Rotary Club Agartala, held at the TCEA Campus on April 9, 2024. It was an honor to have Sri RAM PRASAD PAUL, Deputy Speaker of the Tripura Legislative Assembly, grace the event with his esteemed presence, further amplifying the significance of our collective efforts.

The primary aim is to ensure an adequate supply of blood to meet the demands of patients in need. Blood donation camps educate people about the importance of donating blood and dispel myths associated with it. These camps inspire individuals to contribute to the welfare of society by performing this noble act.

A blood donation camp is a lifeline for countless individuals, embodying the spirit of humanity and altruism. It serves as a reminder that a small act of generosity can create a monumental difference in someone's life. By participating in and supporting such initiatives, individuals contribute to a healthier, more compassionate world.

## Utthan 2.0 : An Awareness Program SC & ST



"UTTHAN 2.0", an awareness program on Special Scholarship Schemes offered by Govt of Tripura/Govert. Of India for upliftment of the SC/ST community students socially, economically and academically was organized by the ST/SC Cell of Techno College of Engineering Agartala on 29th August 2024 at New Seminar Hall, TCEA Campus. The dignitaries on the dais were Dr. Dibakar Deb, Principal Techno College of Engineering Agartala, Professor Dr. Ratan Saha, Vice-chancellor Techno University Tripura, Mr. Pradip Reang, Dy. Director SCW and Mr. Kapil Dasgupta, IT Nodal Assistant, SCW. It is a crucial step toward building a more equitable and inclusive society. By educating people about the importance of social justice, equal opportunities, and community development, such programs contribute to breaking the cycle of marginalization and creating a platform for growth and harmony. Together, we can ensure that every individual, regardless of their background, has the chance to achieve their full potential.

# TCEA Tools: Hands on Learning Towards a Sustainable Construction



## STUDENTS INVOLVEMENT IN MANUFACTURING



Proud to announce that our Civil Engineering Department has launched a paver block manufacturing unit! From concept to production, our students are gaining valuable hands-on experience in sustainable construction techniques. Building pathways for a brighter future.  
 #HandsOnLearning #SustainableConstruction

## Innovation & Sustainability: Sand Filled Bottle Building Construction.



**From Waste to Walls: Utilizing Sand-Filled Waste Plastic Bottles in Construction**

Constructed by Students of Civil Engineering Dept. under the guidance of Dr. Arpan Laskar, Associate Professor, Department of Civil Engineering.

**01. Introduction**  
 WITH THE GROWING ENVIRONMENTAL CONCERN BOTTLE PLASTIC POLLUTION AND THE GROWING NEED FOR RECYCLING PLASTIC BOTTLES, THE PROJECT EXPLORES THE USE OF USED PLASTIC BOTTLES FILLED WITH SAND AS A CORE REINFORCING MATERIAL. THIS METHOD NOT ONLY PROMOTES RECYCLING BUT ALSO OFFERS A STRUCTURALLY SOUND AND COST-EFFECTIVE SOLUTION FOR REINFORCING.

**02. Objectives**  
 THE OBJECTIVE OF CONSTRUCTION: A HOUSE USING SAND AS A REINFORCING MATERIAL TO REINFORCE THE EXISTING CONCRETE STRUCTURE AND REDUCE PLASTIC WASTE AS AN ALTERNATIVE BUILDING MATERIAL. REDUCE ENVIRONMENTAL POLLUTION AND LANDFILL WASTE.

**03. Methodology**  
 THE PROJECT INVOLVED THE FOLLOWING STEPS: COLLECTING USED PLASTIC BOTTLES, CLEANING AND AVAILABILITY PLASTIC BOTTLES, MAKING WASTE MORE ACCESSIBLE, PARTICULARLY IN LESS-INCOME COMMUNITIES.

**04. Results/Findings**  
 1. **STRUCTURAL EFFICIENCY:** LEVERAGING THE COMPRESSIVE STRENGTH OF SAND-FILLED BOTTLES TO CREATE DURABLE AND RESILIENT STRUCTURES CAPABLE OF WITHSTANDING HARSH ENVIRONMENTAL CONDITIONS.

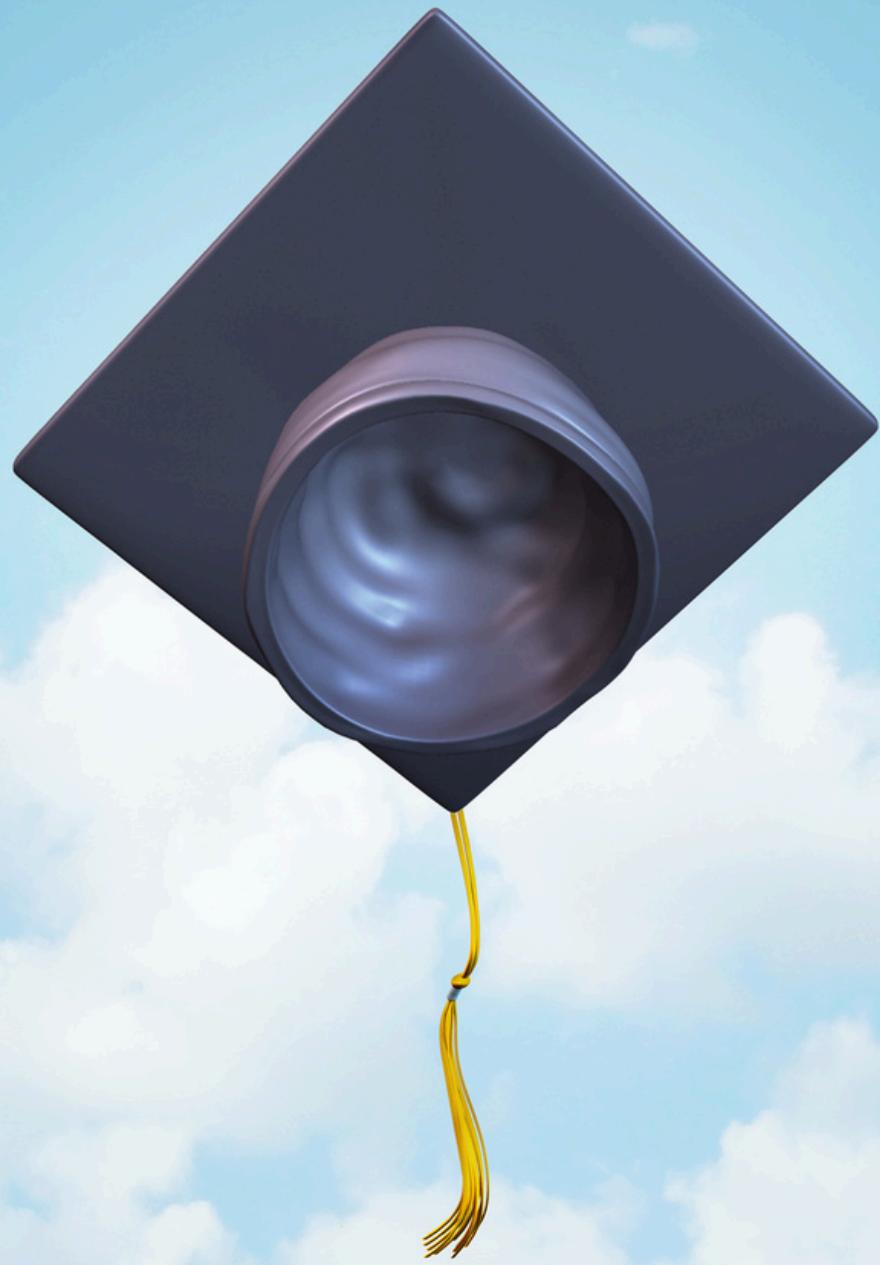
**05. Conclusion**  
 REINFORCING CONCRETE WITH SAND-FILLED BOTTLES IS AN INCREASE IN CONCRETE STRENGTH AND DURABILITY, WHICH ENHANCES THE OVERALL STRENGTH OF THE CONCRETE MATERIAL AND REDUCES SETTLEMENT. THE DEFORMATION WITHIN THE SOIL MASS INDUCES CORRESPONDING STRAIN IN THE CONCRETE, WHICH TRANSFERS THE LOAD TO THE REINFORCING BARS. THIS TRANSFER OF STRAIN TO THE REINFORCING BARS REDUCES LATERAL SOIL MOTION AND TORQUE, IMPROVING THE LOAD-BEARING CAPACITY AND SETTLEMENT BEHAVIOR OF THE REINFORCED SOIL SYSTEM.



'Innovation and sustainability'

Our final-year students have constructed a house using sand-filled bottles, showcasing their creativity, teamwork, and commitment to eco-friendly solutions.

#SustainableFuture 



# A REUNION CEREMONY

# Alumni Meet & Message from Alumni: A Reunion Ceremony



An alumni meet is a highly anticipated event that brings together former students of an institution to reconnect, reminisce, and celebrate their shared experiences. It serves as a bridge between the past and present, uniting alumni across batches while fostering a strong sense of belonging to their alma mater. Alumni meets provide a platform for graduates to revisit their formative years and reconnect with peers, teachers, and the institution. These events facilitate professional networking, offering alumni the chance to share experiences, exchange ideas, and explore collaboration opportunities. Alumni share their success stories, inspiring current students with insights into career development, challenges, and achievements. It is a celebration of shared experiences, individual growth, and collective success. It strengthens the bond between alumni and their alma mater, creating a supportive and inspiring community that continues to thrive and contribute to the

# Campus Placement 2023-24

## Department Of Civil Engineering Civil Engineering With Computer Application

**Inmovidu**  
CE & CECA DEPARTMENT

Tannik Paul	Shayal Das	Atanu Banik	Chesree Chowdhury	Ruma Debnath	Saptarshi Das	Pritiha Sengupta
Mampi Deb	Santa Paul	Sonia Debbarma	Amit Roy	Shibajoyti Sen	Subhranil Debnath	Sonanda Biswas
Tushar Mandal	Priyankajit Sarkar	Manilipa Das	Rima Das	Sourav Majumder	Amrita Chakma	Usham Das

**CONGRATULATIONS TO ALL**

**LearnNex**  
CE & CECA Department

Akash Das	Amit Roy	Atanu Banik	Shibajoyti Sen	Sougata Saha	Pritha Sengupta	Shayal Das
Tapayan Debnath	Subhranjit Debnath	Abhijit Debnath	Tapashree Nag	Tanay Chakraborty	Nilankush Roy	

**CONGRATULATIONS**

# Faculty Member Achievements FDPs & Awards



# Alumni of Civil Engineering Department



**Atul Krishna Mallik**  
Junior Engineer, PWD  
Batch 2018



**Subrata Debnath**  
Assistant Manager,  
Kalpataru Power Industrial Ltd.  
Batch 2019



**Samamita Paul**  
Assistant Engineer Highway,  
Arcadis. Batch 2019



**Sabyasachi Baishnab**  
Panchayat Executive Officer  
Batch 2019



**Subhankar Saha**  
Panchayat Executive Officer  
Batch 2019



**Pritam Saha**  
Panchayat Executive Officer  
Batch 2019



**Sagarika Das**  
Panchayat Executive Officer  
Batch 2020

# Branch Toppers 2023-24

3rd year B.tech Civil Engineering

## 5th Semester



**Tuli Banik**  
SGPA- 9.02



**Dipshika Das**  
SGPA- 8.95



**Madhurima Deb**  
SGPA- 8.91

## 6th Semester



**Tuli Banik**  
SGPA- 7.76



**Ripa Begam**  
SGPA- 7.26



**Dipshika Das**  
SGPA- 7.24

# Branch Toppers 2023-24

3rd year B.tech Civil Engineering and  
Computer Application

**5th Semester**



**Krishanu Chakraborty**  
**SGPA- 8.05**



**Ipsita Deb**  
**SGPA- 7.18**



**Anirban Debnath**  
**SGPA- 7.08**

**6th Semester**



**Ipsita Deb**  
**SGPA- 7.76**



**Krishanu Chakraborty**  
**SGPA- 7.71**



**Deepshikha Das**  
**SGPA- 7.33**

# Best Placements

## Department of Civil Engineering & Civil Engineering with Computer Application



**Surmilita Paul**  
Infosys



**Sagar Debnath**  
Byjus



**Amit Ray**  
Amrit Cement Ltd



**Shibajyoti Sen**  
Amrit Cement



**Medha Roy**  
Infosys



**Pritha Sengupta**  
LearnNex

# Branch Toppers 2023-24

## 2nd year Diploma Civil Engineering (Construction Technology)

### 3rd Semester



**Subarna Laskar**  
**SGPA- 8.85**

**Sudipta Deb**  
**SGPA- 7.60**

**Palash Sutradhar**  
**SGPA- 8.05**

### 4th Semester



**Subarna Laskar**  
**SGPA- 8.50**

**Sudipta Deb**  
**SGPA- 7.70**

**Palash Sutradhar**  
**SGPA- 8.40**

# Branch Toppers 2023-24

## 2nd year B.tech Civil Engineering and Computer Application

### 3rd Semester



**Sneha Roy**  
**SGPA- 7.23**



**Trishna Sharma**  
**SGPA- 7.18**



**Suraj Sarkar**  
**SGPA- 6.95**



**Shruti Das**  
**SGPA- 6.95**

### 4th Semester



**Trishna Sharma**  
**SGPA- 7.43**



**Sneha Roy**  
**SGPA- 7.35**



**Suraj Sarkar**  
**SGPA- 7.09**

# Branch Toppers 2023-24

## 2nd year B.tech Civil Engineering

### 3rd Semester



**Adya Das**  
SGPA- 8.14



**Tirthankar Nama** **Somnath Majumdar**  
SGPA- 8.00 SGPA- 7.59



### 4th Semester



**Adya Das**  
SGPA- 8.83



**Tirthankar Nama**  
SGPA- 8.52



**Puja Debnath**  
SGPA- 8.17



# TECHNO COLLEGE OF ENGINEERING AGARTALA

APPROVED BY AICTE AND AFFILIATED TO TRIPURA UNIVERSITY (A CENTRAL UNIVERSITY)

Volume 3: 2024

# INSIGHT

A PERFECT INSIGHT OF WHAT'S GOING INSIDE



**Campus:** Maheshkhola, Anandanagar, Agartala, West Tripura, 799001