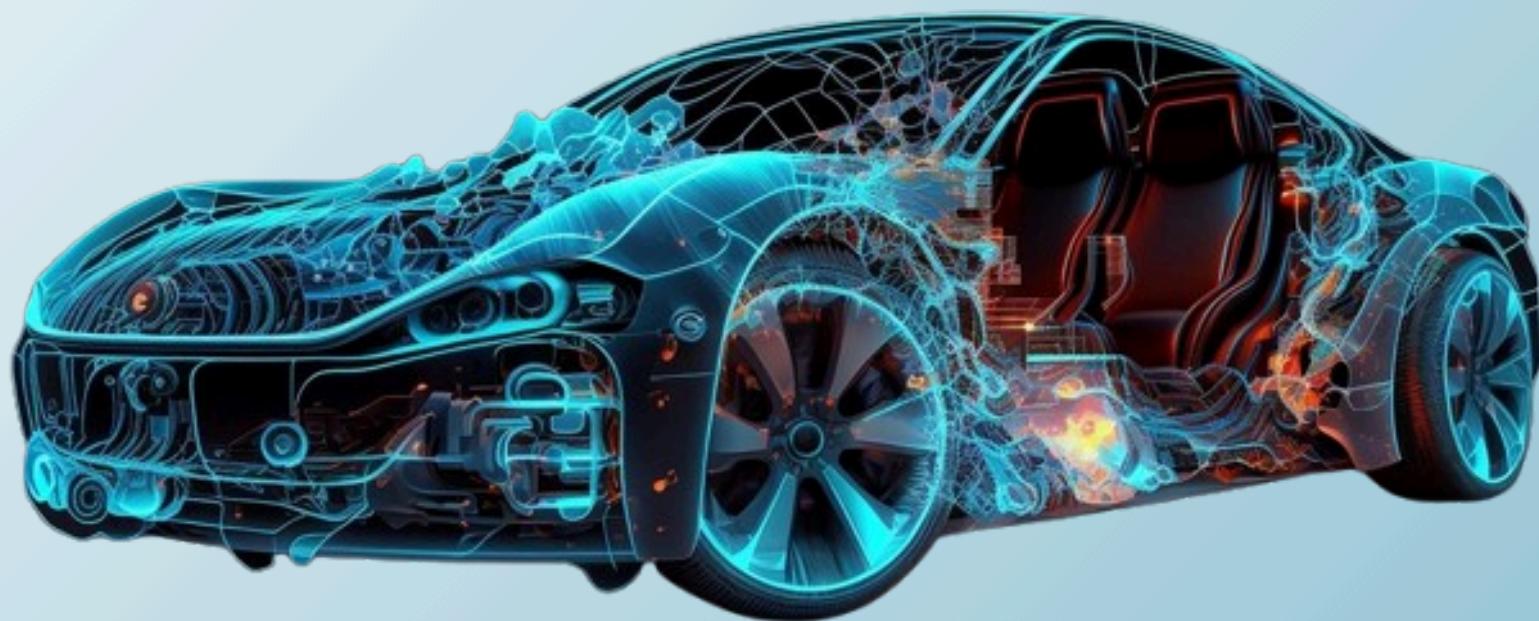




MECH MIRROR

INSTITUTE OF ENGINEERING & MANAGEMENT
SCHOOL OF UNIVERSITY OF ENGINEERING & MANAGEMENT
DEPARTMENT OF MECHANICAL ENGINEERING



PUBLISHED BY :
DEPARTMENT OF MECHANICAL ENGINEERING
IEM, SALT LAKE CAMPUS, KOLKATA

JUL-DEC 2025



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SCHOOL OF UNIVERSITY OF ENGINEERING & MANAGEMENT
DEPARTMENT OF MECHANICAL ENGINEERING

Editor's Note

WELCOME TO THIS ISSUE OF MECH MIRROR. OUR AIM IS TO PROVIDE A VIBRANT PLATFORM FOR SHARING INNOVATIVE IDEAS, EMERGING TECHNOLOGIES, AND IMPACTFUL RESEARCH IN MECHANICAL ENGINEERING AND ALLIED FIELDS. THIS EDITION FEATURES VALUABLE CONTRIBUTIONS THAT REFLECT SCIENTIFIC EXCELLENCE, PRACTICAL RELEVANCE, AND A COMMITMENT TO SUSTAINABLE ENGINEERING SOLUTIONS. I SINCERELY THANK OUR AUTHORS, REVIEWERS, AND EDITORIAL TEAM FOR THEIR DEDICATION AND SUPPORT. I HOPE THIS ISSUE INSPIRES READERS TO EXPLORE NEW PERSPECTIVES, FOSTER COLLABORATION, AND CONTRIBUTE TO THE ADVANCEMENT OF ENGINEERING RESEARCH AND PRACTICE. YOUR CONTINUED ENCOURAGEMENT WILL STRENGTHEN THE JOURNAL'S PURSUIT OF ACADEMIC EXCELLENCE.



Joydip Ray
Assistant Professor, ME Department



MECH MIRROR

INSTITUTE OF ENGINEERING & MANAGEMENT
SCHOOL OF UNIVERSITY OF ENGINEERING & MANAGEMENT
DEPARTMENT OF MECHANICAL ENGINEERING

Editor's Note

Welcome to MECH MIRROR, the official monthly journal of the Department of Mechanical Engineering, Institute of Engineering & Management (IEM), Kolkata. This journal celebrates our department's achievements in academics, research, innovation, industry collaboration, and student excellence. Each issue highlights significant milestones, technical events, publications, workshops, and success stories that reflect our commitment to quality engineering education and sustainable development. We sincerely thank our faculty, students, alumni, and industry partners for their invaluable contributions. We hope this edition inspires learning, innovation, and collaboration across our academic community.



Ranit Karmakar
Associate Professor, ME Department



MECH MIRROR

INSTITUTE OF ENGINEERING & MANAGEMENT
SCHOOL OF UNIVERSITY OF ENGINEERING & MANAGEMENT
DEPARTMENT OF MECHANICAL ENGINEERING

Editor's Note

I truly feel fortunate to be a part of the Mechanical Engineering Department at IEM. The atmosphere and culture here are precisely what one needs for both personal and professional development. Here, each individual's potential is recognized and nurtured, because our strength lies not in quantity but in the quality. Being a part of this department has been an enriching experience, and through this newsletter, I am excited to take you on a journey through student life here.



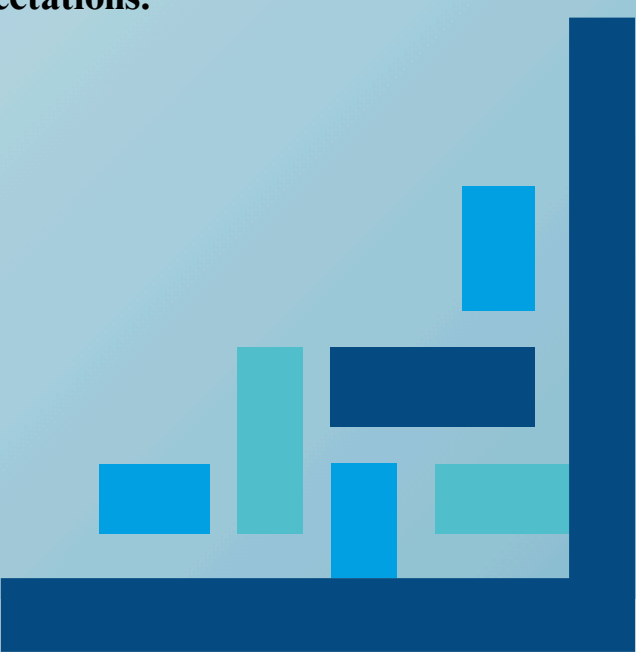
Akashlina Bhowmick
4th Year, ME Department



Vision of Institute

To be a globally recognized educational institution known for outcome education application research.

Mission of Institute

- **To assist students to understand and enjoy seamless nature of knowledge and encourage them to apply the acquired knowledge to practical use, so that they become worthy, socially responsible good human beings sought after for their leadership qualities.**
 - **To foster creativity, innovation, and excellence through example based teaching-learning process imparted in the most simple and easily comprehensible way.**
 - **To continuously inuously upgrade knowledge base of our manpower, improve infrastructure and use of latest technology/pedagogical tools, and update curriculum through periodic feedback from stakeholders to enable students to meet professional requirements and their expectations.**
- 



Vision of Department

To excel in education and research in the field of Mechanical Engineering through Innovation and skills to meet the challenges

Mission of Department

M1: To offer state-of-art learning in Mechanical Engineering, by creating thirst of knowledge among the students through outcome based teaching and learning process.

M2: To build a research capability that is recognized globally as a leading source of technological innovation for benefit of mankind.

M3: To create opportunities to meet the industry requirements and to develop a mind entrepreneurship by institute partnership.



INDUSTRIAL VISIT REPORT ON VARIABLE ENERGY CYCLOTRON CENTRE (VECC), KOLKATA

An industrial visit to the Variable Energy Cyclotron Centre (VECC), Kolkata was organized on 20 January 2026 by the IIW-IEM Students' Chapter. VECC is a premier research institute under the Department of Atomic Energy (DAE), Government of India, engaged in advanced research in nuclear physics and particle accelerator technology.

Distinguished faculty members, along with student representatives, attended the ceremony. The newly appointed members of the Core Working Committee took an oath to uphold the values and objectives of the Institution. The event also featured motivational speeches highlighting the importance of innovation, collaboration, and commitment in shaping future engineering leaders.

KEYNOTE SPEAKERS

Mr. Ramanjaneyulu Naidu

Scientist D, Defence Research and Development Organisation (DRDO). Mr. Ramanjaneyulu Naidu joined DRDO in 2013 and has since been actively involved in aero and thermal analysis. Currently, he is leading initiatives focused on integrating Artificial Intelligence and Machine Learning (AI/ML) within the aerodynamics domain. He completed his Bachelor's degree from the Aeronautical Society of India (AeSI) and earned his Master's degree from IIT Kharagpur, where he was the batch topper and Gold Medal recipient. He was also awarded the ARDB (Aeronautics Research and Development Board) Scholarship for excellence in research. Mr. Naidu is a member of the Aeronautical Society of India (AeSI) and the American Institute of Aeronautics and Astronautics (AIAA). His talk inspired students to explore innovation in aerospace engineering and to merge traditional aerodynamics with emerging AI-driven approaches.



Mr. K. Ramachandran

Deputy Director, Aircraft Accident Investigation Bureau (AAIB). Mr. K. Ramachandran is currently serving as Deputy Director at the Aircraft Accident Investigation Bureau (AAIB), Government of India. He holds a Bachelor's degree in Aeronautical Engineering (AMAE SI) from the Aeronautical Society of India and a Master's degree (M.Tech) from Motilal Nehru National Institute of Technology (MNNIT). He began his career with the Directorate General of Civil Aviation (DGCA) as a consultant (2010–2012) and was later appointed as an Air Safety Officer in 2012 through the UPSC. Since the inception of AAIB on 31st July 2012, he has been associated with the bureau and has conducted over 50 aircraft accident and serious incident investigations.

Currently, as Deputy Director at AAIB, Mr. Ramachandran oversees national-level investigations and represents India in global aviation safety initiatives. His recent achievement includes being selected for secondment to the International Civil Aviation Organization (ICAO), a United Nations organisation. His insightful address at the ceremony shed light on the importance of air safety, human factors, and engineering precision in modern aviation.

INSTALLATION CEREMONY OF IEI CORE WORKING COMMITTEE (CWC)

IEI-IEM CWC Members 2025-26

- 1) Prince Dey - Chairman
- 2) Arnab Namata - Secretary
- 3) Prabhjyot Singh - Treasurer
- 4) Arghya Majumdar - Membership Chair
- 5) Lisa Ghosh - GWC President
- 6) Koushambi Banerjee - Campus Ambassador
- 7) Dhruva Singha - Graphics Chair PR Head
- 8) Aadya Sharma - Graphics Co Chair
- 9) Madrid Sarkar - Social Media Manager
- 10) Tiya Sahana - Spokesperson
- 11) Nayan Roy - Spokesperson
- 12) Ishita Datta - Spokesperson
- 13) Soumili Ghosh - Spokesperson

The Installation Ceremony of the Core Working Committee (CWC) for 2025–2026 was a memorable and inspiring event. The presence of eminent speakers from DRDO and AAIB enriched the occasion, motivating students to pursue leadership, research, and innovation in their respective fields. The ceremony marked the beginning of a new chapter for the IEI-IEM Students' Chapter, encouraging members to actively contribute to professional growth and technological advancement.



INDUSTRIAL VISIT TO WBREDA

The industrial visit was conducted at the West Bengal Renewable Energy Development Agency (WBREDA), also known as Bikalpa Shakti Bhavan, on August 28, 2025. The focus of the visit was a grid-connected solar photovoltaic (PV) power plant designed to provide practical exposure to solar energy systems.

The total capacity of the observed plant is 20 kWp. The system utilizes 76 modules, each rated at 265 Wp polycrystalline. This configuration is divided into two arrays, each with a capacity of 10 kW. The arrangement consists of two strings, with 38 panels connected in series within each string. The electrical characteristics of each module include an open circuit voltage (V_{oc}) of approximately 45 V and a nominal voltage (V_n or V_{mp}) of around 36 V. The current specifications are a short circuit current (I_{sc}) ranging from 7 to 8 A and a maximum current (I_m) of about 7 A.

The plant employs two 10 kVA inverters for DC to AC conversion. The inverter system operates within a voltage window of 240 V to 800 V, with the stable operating range identified as 500 V to 600 V. The theoretical calculation of the string voltage (19×45 V) results in 855 V, which exceeds the safe operating range and therefore requires practical adjustment.

During the visit, practical data was recorded showing an observed power output (P_{out}) of 8.5 kW. The measured output voltage (V_{out}) was approximately 419 V, and the bulk voltage (V_{bulk}) was around 660 V. This 8.5 kW output yielded a performance ratio (PR) of 42.5% ($8.5 \div 20 \times 100$). The lower output was attributed to potential factors such as partial shading, non-ideal irradiance, temperature losses, and DC/AC conversion losses. The system includes safety features such as SPDs (Surge Protection Devices) before the inverter input, an ACDB (AC Distribution Board), and DC protection through isolators and fuses. Plant operations are monitored using a SCADA system. The estimated theoretical daily yield is 90 kWh per day, while the practically measured output for the recorded day was approximately 17 kWh.

The industrial visit to WBREDA provided valuable insights into renewable energy technologies and their practical implementation. Students gained hands-on understanding of solar photovoltaic systems, which will aid in their academic and professional growth. The visit successfully bridged the gap between theoretical learning and industrial application.



TECHNICAL WEBINAR – FLOW TO FUNCTION & ROTOR DYNAMICS

The Institution of Engineers (India) – IEM Students' Chapter (ME) successfully conducted a technical webinar titled 'Flow to Function – Integrating Compressible Flow and Roto-dynamics for Next-Generation Engineering' on 09 October 2025 at 4:00 PM IST.

The Institution of Engineers (India) – IEM Students' Chapter (ME) successfully conducted a technical webinar titled 'Flow to Function – Integrating Compressible Flow and Roto-dynamics for Next-Generation Engineering' on 09 October 2025 at 4:00 PM IST.

Overview

Compressible flow occurs when fluid density changes significantly due to pressure or temperature variations—common in supersonic jets, turbine blades, and rocket nozzles.

Understanding these flows requires a combination of experimental, computational, and safety-based approaches.

Topics Covered

Experimental Methods -

Wind Tunnel Testing

Schlieren Photography & Laser Diagnostics (PIV, LIF)

Pressure & Temperature Probes

Computational Simulations -

DNS (Direct Numerical Simulation)

LES (Large Eddy Simulation)

RANS (Reynolds-Averaged Navier-Stokes)

Safety Protocols -

Reinforced Test Chambers and Remote Operation Systems.

Protective Shielding, Ventilation, and Automated Shutoff Systems

Controlled Environment Testing

Date: 09.10.2025
Time: 16.00 hrs

The Institution of Engineers (India)
8 Gokhale Road, Kolkata - 700020, West Bengal, India
(Established in 1920, Incorporated by Royal Charter 1935)
[A Scientific and Industrial Research Organisation]
A Century of Service to the Nation
IEI Technical Webinar

Flow to Function Integrating Compressible Flow and Roto-dynamics for Next-Generation Engineering

Organised by
The Institution of Engineers (India)
Under the aegis of
Mechanical Engineering Division
In Association with
IEM
INSTITUTE OF ENGINEERS & MANAGEMENT
Good Education, Good Jobs

Panelists

- Dr Somnath Ghosh**
Associate Professor
Department of Aerospace Engineering
(IT) Kharagpur
- Dr Haraprasad Roy**
Associate Professor
National Institute of Technology
Rourkela

Moderator

- Dr Subho Mukherjee**
Associate Professor
Department of Mechanical Engineering
IEM Kolkata

Registration is a must for attending the Webinar and for free registration, you are requested to register by using following link or following code
https://us06web.zoom.us/join/register?WV_TcxGL10QJmDg4Ldww

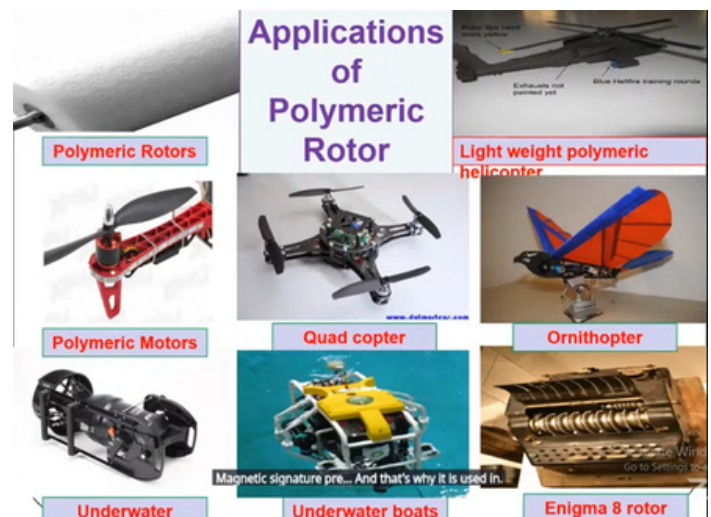
The participants who opt for "e-Certificate of Participation", need to register themselves first using the registration following link or code and thereafter make a nominal payment of INR 300/- + GST @ 18% using the payment gateway available against this code (active till midnight of 10.10.2025):
<https://ieindia.org/admin/webinar.aspx?FPeCmVPMdybY+K42BpE0U2mF0UNATY1H00RAN>

E-Certificate will be sent by email after 5 working days along with the tax receipt

For any assistance, please email to: medb@ieindia.org

This is an approved CPD programme of The Institution of Engineers (India)

Live streaming of the event can be viewed on
<https://www.youtube.com/channel/UCB-dnZ0ohQvRdRoxpsDYw5A>



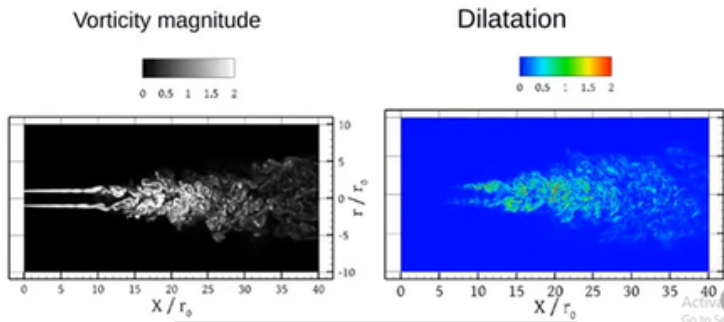
Experimental techniques reveal what happens in compressible flows; computational simulations explain why it happens, while safety protocols ensure how it can be studied responsibly.

Together, these three pillars form a robust framework for advancing fluid mechanics research.

TECHNICAL WEBINAR – FLOW TO FUNCTION & ROTOR DYNAMICS

DNS of compressible round jet at $M=0.9$, $Re=3600$ (P. Thaker, J. Mathew and SG, J. fluid Mech., 2023)

40ro in axial, 10ro in radial. 800X160x250 (32 million) points, 160 cores



DNS of supersonic planar symmetric and asymmetric nozzles

- 192x128x151 gridpoints each for incoming channel and nozzle on 128 cores for 3 months.

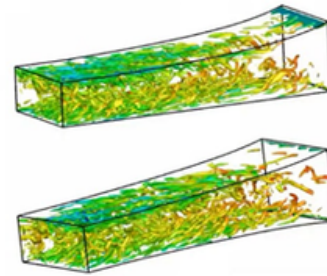


Figure 4.2: Iso- ρ surfaces typically denotes the finer, uh, scales of prevalence. metric nozzle, case 1 (bottom) symmetric nozzle, case 2

Shock trains in ducts

- Shock train in supersonic internal flows occur due to changes in the thickness of the near-wall viscous layer in presence of adverse pressure gradient.
- Re , M (and flow confinement) of the incoming flow dictate the nature of the shock train that occurs



(d) Shock train ($1.5 < M_{1e}$)

Applications of Polymeric Rotor

Polymeric Rotors



Polymeric Motors



Underwater



Quad copter



Underwater boats



CWC INSTALLATION OF IIW IEM STUDENTS CHAPTER

The Installation Ceremony of the IIW IEM Student Chapter (2025-26) was successfully held on 25th August 2025 at the Institute of Engineering & Management (IEM), Kolkata. The event was jointly organized by the Department of Mechanical Engineering, IEM, in collaboration with the Indian Institute of Welding (IIW) India and the University of Engineering & Management (UEM).

The primary purpose of this ceremony was to formally induct the newly elected Core working Committee (CWC) members of the student chapter for the academic session 2025-26 and to present the vision, objectives, and roadmap of the chapter for the forthcoming year. The occasion served as a significant platform to highlight the role of IIW in fostering technical excellence, industry-academia collaboration, and student engagement in the field of welding and allied technologies.



The program commenced with a warm welcome by the Head of the Mechanical Engineering Department. He highlighted the importance of collaboration, knowledge sharing, and continuous growth. Distinguished invited guests also graced the occasion, adding value with their presence.

Prof. Santanu Das, Professor and Former Head of Department at Kalyani Government Engineering College, and Chairman of IIW Kolkata Chapter, delivered the introduction. He spoke on the role of the Indian Institute of Welding (IIW) in advancing welding technology and its contributions to academia and industry. His words inspired the audience and emphasized collaboration and professional growth.

A key highlight of the event was the Installation Ceremony. During this session, newly elected members took charge of their roles and responsibilities. The ceremony symbolized leadership, dedication, and the spirit of teamwork. Faculty members, students, and invited dignitaries appreciated the commitment of the new team and extended their best wishes for their journey ahead.



CWC INSTALLATION OF IIW IEM STUDENTS CHAPTER



INDUSTRY VISIT

Industrial visits form an essential component of engineering and technical education, providing students with practical exposure to real-world manufacturing processes, industrial operations, and organizational practices. As part of our academic curriculum, students visited Texmaco Rail & Engineering Ltd., Belghoria, one of India's oldest and most reputed heavy engineering and railway equipment manufacturing companies. The purpose of the visit was to understand the industrial workflow, advanced engineering practices, modern manufacturing technologies, and safety standards followed in large-scale production environments.



The key objectives of the industrial visit to Texmaco were:

1. To gain practical knowledge related to manufacturing processes such as cutting, welding, machining, casting, and assembly.
2. To observe the large-scale production of railway wagons, bogies, and structural components.
3. To understand the functioning of CNC and automated machines, material handling systems, and inspection methods.
4. To learn about industrial safety protocols and quality control practices followed in heavy engineering industries.
5. To relate theoretical concepts from mechanical engineering subjects like Production Technology, Manufacturing Processes, Kinematics, Welding Technology, and CAD/CAM.
6. To explore the organizational structure and understand how engineering teams coordinate with design, production, and quality departments.
7. To improve teamwork, industrial communication, and observation skills through real-life exposure.



INDUSTRY VISIT



SEMINAR REPORT: FUNDAMENTALS OF WELDING PROCESS

Welding is a key manufacturing process used for permanent joining of materials in industries such as automotive, aerospace, construction, and fabrication. It involves material coalescence through heat, pressure, or both, and requires controlled parameters to ensure joint strength and quality. To build fundamental understanding and awareness of modern welding technologies, a seminar on “Fundamentals of Welding Process” was conducted on 28 October 2025 by IEM in collaboration with IIW Kolkata Branch, delivered by Prof. (Dr.) Santanu Das.



Overview of Speaker

Prof. (Dr.) Santanu Das, Professor & Former Head of Mechanical Engineering at Kalyani Government Engineering

College and Chairman of IIW Kolkata Branch, has made significant contributions to the field of welding technologies, industrial training, and materials research.

Key Topics Discussed

Welding Classification

- Fusion Welding: SMAW, TIG, MIG, SAW, Plasma Welding,

Laser Beam Welding

- Solid State Welding: Friction Welding, Ultrasonic Welding,

Explosive Welding, Friction Stir Welding (FSW)

The seminar successfully connected theoretical understanding with practical and industrial exposure. Emphasis on metallurgy, automation, and optimization of welding parameters offered students a deeper vision of both academic and industrial prospects.



FELICITATION & INSTALLATION CEREMONY- SAE-IEM

On 9th April, 2025, the CWC members of the society year 2024-2025 were felicitated and the newly formed Core Working Committee members of the society year 2025-2026 were presented their respective chairs to hold. All the past and present members were felicitated by our respected teachers.



FELICITATION & INSTALLATION CEREMONY- SAE-IEM



**SAE IEM COLLEGIATE CLUB**
CORE WORKING COMMITTEE
SESSION 2025-2026

**Avinandan Mukherjee**
Student Chairperson

**Sarnak Mallick**
Student Secretary

**Rudransh Mishra**
Student Vice Chairperson

**Arghyadip Das**
Student Treasurer

**Saugnik Aich**
Student Technical Chair

**Uday Guha**
Student Membership Chair

Follow us on  SAE - IEM Collegiate Club  saeiemclub

**SAE IEM COLLEGIATE CLUB**
CORE WORKING COMMITTEE
SESSION 2025-2026

**Aritra Roychowdhury**
Publicity Chair

**Aditi Rai**
Program Chair

**Paulami Bhakat**
Graphics Chair

**Sneha Senapati**
Co- Graphics Chair

**Adrija Lahiri**
Public Relations Chair

**Aditri Sharma**
Reception Chair

**Souratya Mukherjee**
Spokesperson

**Srabanti Paul**
Spokesperson

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PIXELS & PISTONS

Pixels & Pistons, an online graphic designing competition was organised on 26th August, 2025. Submissions were from two categories, poster designing and video editing. The winners are as follows:



SAE IEM COLLEGIATE CLUB

PIXELS & PISTONS

Graphics Designing Competition

BEST VIDEO DESIGN

1st- Ariyan Sarkar (CSE CORE- 1st year IEM)
2nd- Aishwarya Dhawa (CSE- 1st year IEM)
3rd- Ayush Shaw (CSE AIML- 1st year IEM)
3rd- Chandni Mallick (ME- 3rd year IEM)



SAE IEM COLLEGIATE CLUB

PIXELS & PISTONS

Graphics Designing Competition

BEST POSTER DESIGN

1st- Rohit Dasgupta (Biotechnology- 2nd year UEM)
2nd- Rikta Pati (CSE- 3rd year IEM)
3rd- Falak Bhati (IT- 3rd year IEM)



MECHTRONICA (2025)

We were delighted to welcome Prof. (Dr.) Kaustav Pradhan as our esteemed guest at Mechtronica - Day 1 i.e. 19th October, 2025. The day started with the felicitation ceremony and proceeded with Prof. Pradhan sharing his valuable insights on Computational Fluid Dynamics (CFD).



ASHRAE EAST INDIA CHAPTER INSTALLATION CEREMONY 2025-26

The ASHRAE East India Chapter celebrated its Installation Ceremony for the Society Year 2025-26 on Wednesday, 13th August 2025, at The Spring Club, 5 JBS Halden Avenue, Kolkata. The place was gathered by key industry figures including Debajyoti Dey (Past President), Manish Tiwari (Incoming President), Manoj Chakraborty (Installation Officer), Mrinal Sarkar (President Elect), Abhishek Banerjee (Vice President), Hersh Bhanu (Secretary), Shankha Bhattacharya (Treasurer), Richie Mittal (Guest of Honour), JP Agarwal (Chief Guest).

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This year's theme, "Connect", highlighted the importance of collaboration and networking within the engineering community.

The event was graciously hosted by Soumi Roy, a recent graduate from the ME Department of IEM, Kolkata. The ceremony commenced with a heartfelt welcome song by a CWC member, followed by the formal acknowledgment and appreciation of the previous year's CWC members. Certificates were distributed segment-wise, recognizing individual contributions. They also give respect to ASHRAE IEM Student Branch



ASHRAE EAST INDIA CHAPTER INSTALLATION CEREMONY 2025-26



INSTALLATION CEREMONY OF CWC COMMITTEE OF ASHRAE IEM STUDENT BRANCH FOR SESSION 2025-26

The 5th ASHRAE Installation Ceremony for the session 2025–26 was held on 29th August, 2025 at the CII Auditorium, IEM Management House. The program commenced with the National Anthem. The event was graced by the presence of eminent internal guests including Prof. Dr. Dwaipayan De (HOD, Dept. of ME), Prof. Dr. Rajat Shubhra Pal (HOD, Dept. of EEE), Prof. Dr. Gunjan Kumar (Faculty Advisor of IEM), Prof. Somnath De (Faculty Advisor of IEM), and the massive participation of 45 students. The ceremony was hosted by Shankha Subhra Ghosh (ME, 3rd Year) and Payel Dutta (ME, 3rd Year). The highlight of the program was the oath-taking ceremony, which was conducted by Mr. Shankha Bhattacharyya. The oaths were taken by the CWC members starting with the oath of the new president. A group photo session was held to capture the occasion. The event was then brought towards its conclusion with a Vote of Thanks delivered by the new president of ASHRAE IEM Student Branch.

In conclusion, the 5th ASHRAE CWC Installation for the academic year 2025–26 was a grand success. The program, enriched with enlightening presentations, inspiring speeches, and formal installations. The event concluded on a positive note with certificate distribution and refreshments, leaving behind an engaging and memorable experience for all attendees.



INSTALLATION CEREMONY OF CWC COMMITTEE OF ASHRAE IEM STUDENT BRANCH FOR SESSION 2025-26



DISTINGUISHED LECTURE ON “AI IN HVAC INDUSTRY: PAST, PRESENT & FUTURE”

Krishnan Gowri is a Senior Engineering Fellow at Energy Solutions with over 30 years of expertise in building science, energy modelling, and performance analysis. He is a key contributor to COM check and led the building energy codes team at Pacific Northwest National Lab for 15+ years, achieving major advances in Energy Plus and Revit integration. Krishnan has guided architects and owners in building energy code compliance, and actively mentors in building science and performance assessments. An ASHRAE Fellow, he has served as a Board Member of IBPSA-USA, chaired the 2027 ASHRAE Handbook on Applications, and contributes to AI applications in HVAC and sustainable building codes.

Artificial Intelligence (AI) is transforming the HVAC (Heating, Ventilation, and Air Conditioning) industry by making systems smarter, more efficient, and cost-effective. AI-powered solutions analyze real-time data such as weather conditions, occupancy levels, and energy consumption patterns to optimize heating and cooling operations, thereby reducing energy waste and lowering utility costs. Predictive maintenance powered by AI helps detect potential faults early, preventing unexpected breakdowns and extending equipment life. Integration with smart building technologies enables personalized comfort, improved indoor air quality, and seamless automation. Additionally, AI-driven HVAC systems contribute to sustainability by minimizing carbon emissions and supporting green building initiatives.

Overall, AI is revolutionizing HVAC by enhancing comfort, cutting costs, and promoting energy efficiency.

IEM **ASHRAE East India Chapter** **ASHRAE** **UEM**

DISTINGUISHED LECTURE
AI in HVAC Industry: Past, Present & Future

Krishnan Gowri
Senior Engineering Fellow
Energy Solutions, Oakland, CA
Expert in Energy Modeling and HVAC Systems
ASHRAE Fellow & DL

Krishnan Gowri is a Senior Engineering Fellow at Energy Solutions with over 30 years of expertise in building science, energy modeling, and performance analysis. He is a key contributor to COMcheck and led the building energy codes team at Pacific Northwest National Lab for 15+ years, achieving major advances in EnergyPlus and Revit integration. Krishnan has guided architects and owners in building energy code compliance, and actively mentors in building science and performance assessments. An ASHRAE Fellow, he has served as a Board Member of IBPSA-USA, chaired the 2027 ASHRAE Handbook on Applications, and contributes to AI applications in HVAC and sustainable building codes.

MODERATOR OF THE SESSION
K.K. Mitra
RVC CTC
Region XV DL

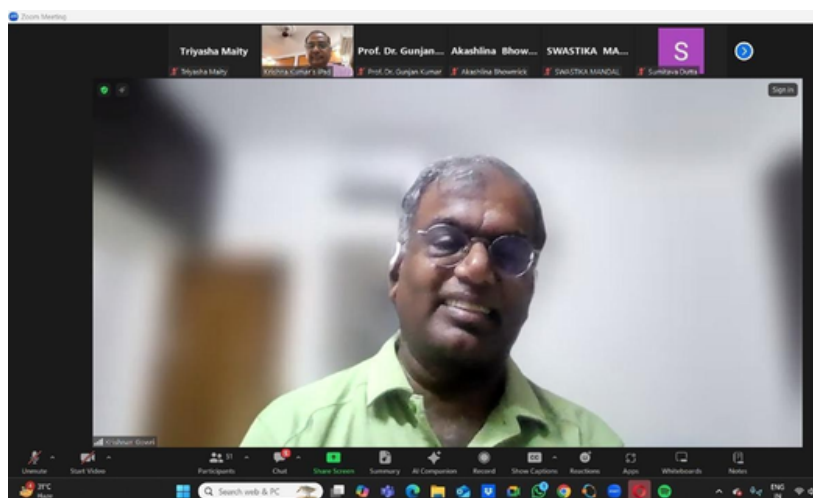
CO-ORDINATOR OF THE SESSION:
DR. GUNJAN KUMAR
FACULTY ADVISOR OF ASHRAE IEM STUDENT BRANCH,
IEM SALT LAKE
STUDENT CHAIR, ASHRAE EAST INDIA CHAPTER

06TH SEPTEMBER, 2025
7:00 - 8:30 PM

VIRTUAL ZOOM MEETING
[HTTPS://US06WVWR.ZOOM.US/j/835781520497](https://us06wvwr.zoom.us/j/835781520497)
PWD=66WTF5E80GWBVE3355FAF3PVBW30D31

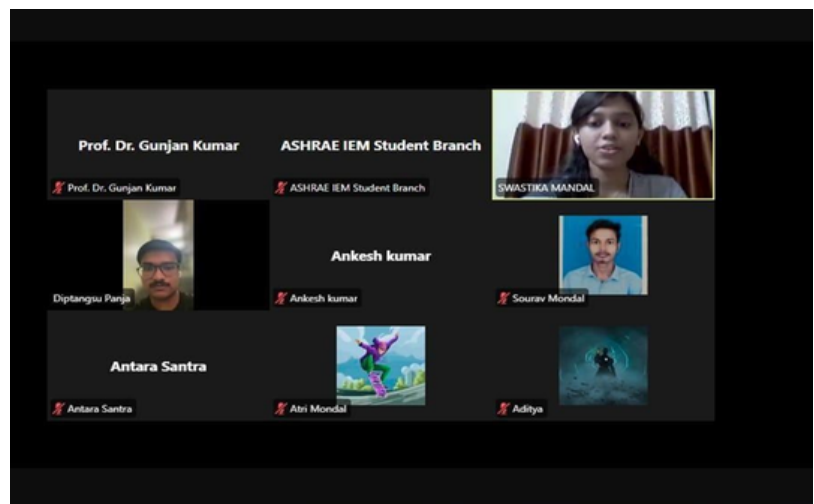
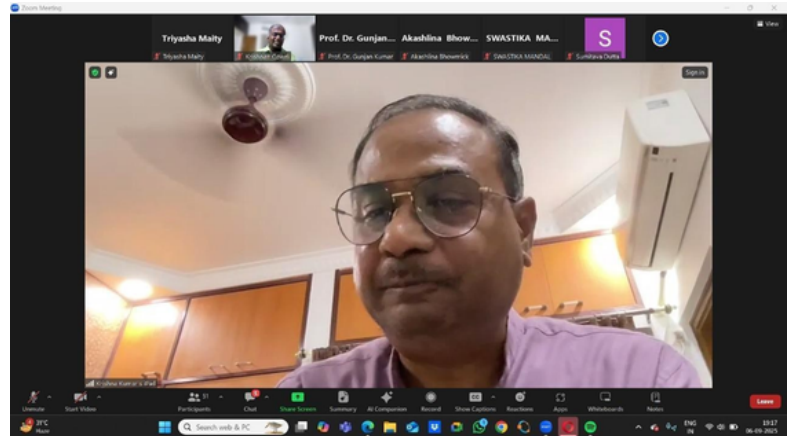
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DISTINGUISHED LECTURE ON “AI IN HVAC INDUSTRY: PAST, PRESENT & FUTURE”

The DL Talk on “AI in HVAC Industry: Past, Present & Future” was held on 6th September 2025 via Zoom from 7:00 pm to 8:30 pm. The session began with a welcome address by the Host Swastika Mondal, followed by the introduction of the topic and introduction of the guests by Prof. Dr. Gunjan Kumar. Mr. K.K. Mitra introduced the main speaker Mr. Krishnan Gowri. The main talk on the theme was covering the past developments, current applications, and future prospects of Artificial Intelligence in the HVAC industry. Following the presentation, a question answer session was conducted providing participants the opportunity to engage with the speaker. The event concluded with a vote of thanks presented by the President of ASHRAE IEM Student Branch Mr. Diptangsu Panja. The session was insightful and well-structured, offering valuable perspectives on the evolving role of AI in the HVAC sector.

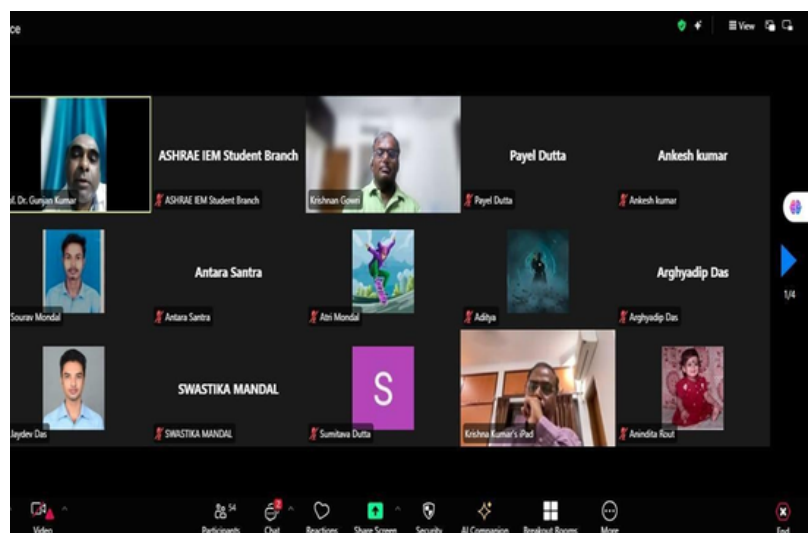


Hardy–Ramanujan number

"I remember once going to see him when he was ill ridden in taxi cab number 1729 and remarked that to me rather a dull one, and that I hoped it was not a women. "No," he replied, "it is a very interesting number. It is the smallest number expressible as the sum of two cubes in two different ways."

$$1729 = 1^3 + 12^3 = 9^3 + 10^3$$

- Just a four digit number – nothing special
- Represents sum of two cubes
- Represents sum of two cubes in two different ways
- Represents smallest number expressible as sum of two cubes in two different ways
- Number divisible by the sum of its digits



INSTALLATION CEREMONY OF CWC COMMITTEE OF ISHRAE IEM MODEL STUDENTCHAPTER FOR SESSION 2025-26

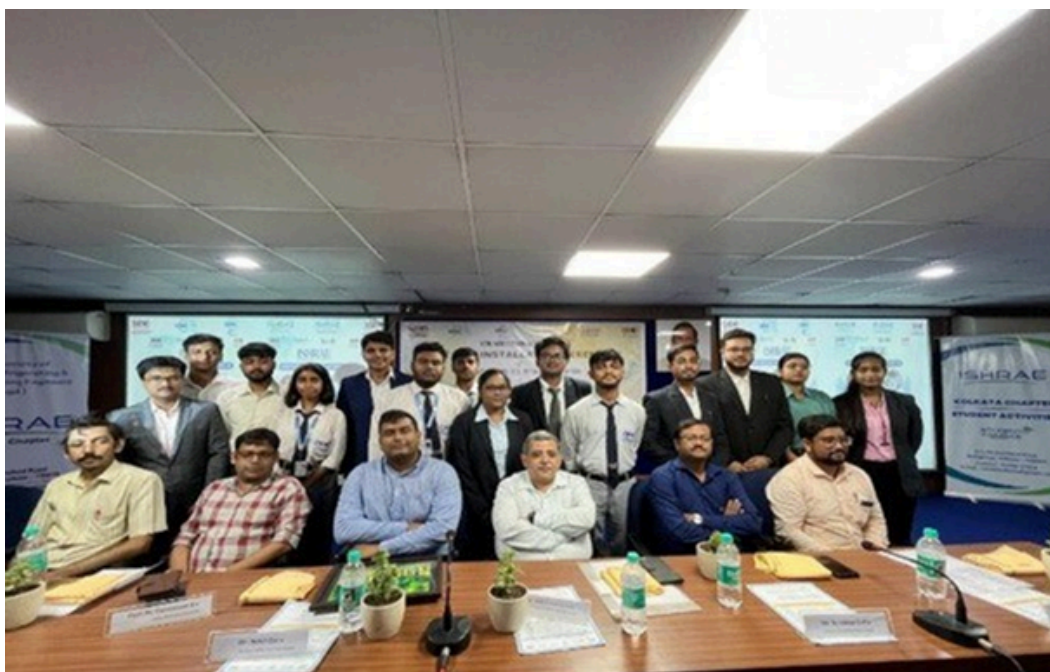
ISHRAE IEM Model StudentChapter Core WorkingCommittee (CWC) Installation for the academic year 2025–2026. The program formally inducted the new student leadership, outlined the roles and responsibilities for the year, and featured an expert talk designed to strengthen student–industry engagement in HVACCR. Key outcomes included a renewed commitment to ISHRAE’s mission, a focused activity roadmap, and stronger participation pledges from student members.



			
PROF. GUNJAN KUMAR FACULTY ADVISOR (ME)	PROF. SOMNATH HAZRA FACULTY ADVISOR (EE)	PROF. SOMNATH DE FACULTY ADVISOR (ME)	
			
ABHIRUP CHAKRABORTY PRESIDENT	AKASHLINA BHOWMICK SECRETARY	PRIYANSHU PAUL TREASURER	ZEBRA RAHMAN GWC PRESIDENT
			
SANKHA SUBHRA GHOSH RESEARCH CHAIR	AURKO MUKHERJEE ACTIVITY CHAIR	SOURAV KUNDU TECHNICAL CHAIR	DIPTANGSU PANJA MEMBERSHIP CHAIR

“Advancing HVAC&R Knowledge, Fostering Innovation”

INSTALLATION CEREMONY OF CWC COMMITTEE OF ISHRAE IEM MODEL STUDENT CHAPTER FOR SESSION 2025-26



ENGINEER'S DAY VIDEO MAKING COMPETITION

The Engineer's Day Video Making Competition was organized by ASHRAE to commemorate the contribution of engineers to society and to promote creative thinking among students. The event encouraged participants to express their innovative ideas through the medium of video, showcasing their vision of engineering excellence and creativity.

The Mechanical Engineering Department of IEM and UEM participated in this competition on 15th September, 2025 with great enthusiasm, aiming to create a meaningful and inspiring visual story highlighting the role of engineers in shaping the modern world.

The central theme of the competition focused on "The Role of Engineers in Nation Building." Our team collaboratively developed the concept, drafted the script, and managed all stages of production including filming, editing, and narration. The video illustrates how engineering impacts everyday life, driving progress through innovation and problem-solving. Through effective teamwork, we combined technical understanding with creativity to deliver a compelling message.

Participating in the ASHRAE Engineer's Day Video Making Competition was a truly rewarding experience for our team from the Mechanical Engineering Department of IEM and UEM. It gave us a platform to express our creativity, strengthen teamwork, and appreciate the importance of engineering in nation building. The event not only celebrated the essence of engineering but also inspired us to continue innovating and contributing positively to society as future engineers.

VRV SITE VISIT

On 30th August 2025, our batch undertook an industry visit to gain practical exposure to modern HVAC, refrigeration, electrical, piping, and safety systems used in building projects. The visit served as a bridge between classroom learning and industrial practice. Observing these installations in real time helped us understand not only their design principles but also their role in achieving efficiency, safety, and sustainability in large infrastructure projects

Participants: 1. Raunak Mitra

2. Sudip Chowdhury

3. M. Aditya Varma

4. Aniket Sahu

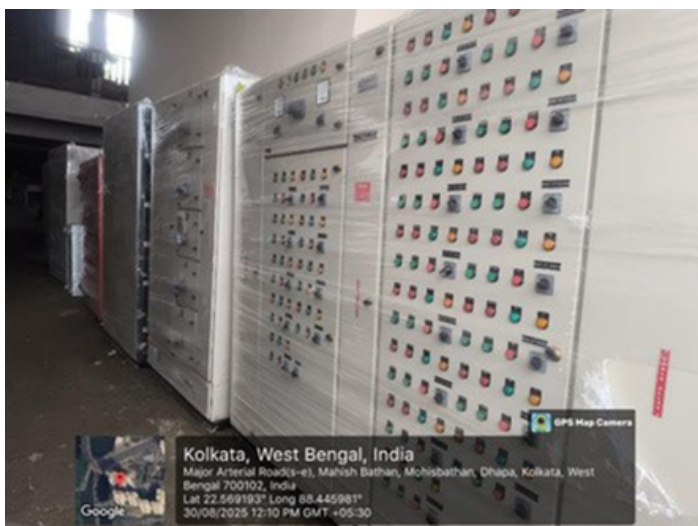
5. Ayush Raj

6. Ankesh Kumar

Lisa Ghosh.



VRV SITE VISIT



ENGINEER'S DAY CELEBRATION & TECHNICAL TALK

The ISHRAE Kolkata Chapter, in collaboration with the Students' Chapter, celebrated National Engineers' Day and ISHRAE Students' Day on 19th September 2025 at MSIT Campus. The program opened with a highly enriching

Technical Talk by Mr. Dipak Barma, one of the most accomplished professionals in the HVAC industry, along with a good mentoring session by Ms. Jayeeta Mukherjee on Career Guidance and Goal Setting and a debate competition.



ENGINEER'S DAY CELEBRATION & TECHNICAL TALK



REPORT ON DEBATE COMPETITION: “HVAC, SUSTAINABILITY & THE ROLE OF ENGINEERS IN A DECARBONIZED FUTURE”

On 19th September 2025, as part of National Engineers’ Day and ISHRAE Students’ Day celebrations at MSIT Campus, a thought-provoking Debate Competition was organized. Hosted with confidence and professionalism by Ms. Jayeta Mukherjee, the event set an engaging and interactive tone.

Three student teams—two from MSIT and one from IEM, Kolkata— participated on the theme “HVAC, Sustainability & the Role of Engineers in a Decarbonized Future.” More than a contest, the session evolved into a dynamic brainstorming platform, where participants analyzed root-level challenges, suggested innovative solutions, and envisioned the pivotal role of engineers in advancing sustainability.

The Debate Competition was a resounding success, combining technical depth with reflections on social and environmental responsibility. Participants showed that achieving a decarbonized future demands innovation, cooperation, and accountability at every level.

The session highlighted that future engineers will not only design HVAC systems but also shape sustainable solutions for humanity and the planet. The message was clear— HVAC today means cooling responsibly, sustainably, and equitably.

This brainstorming-driven debate provided students with valuable insights and a renewed sense of duty, making it a memorable highlight of the celebration.



FDP: EMPOWERING MECHANICAL ENGINEERING RESEARCH THROUGH INNOVATION AND IP AWARENESS

The FDP “Empowering Mechanical Engineering Research Through Innovation and IP Awareness” aims to enhance the research capabilities of mechanical engineering faculty by fostering innovative thinking and strengthening understanding of Intellectual Property (rights). This program will focus on emerging research trends, research methodology, ideation strategies, and the importance of protecting intellectual assets through patents and other IP mechanisms. Through expert sessions, interactive discussions, and practical guidance on patent filing, prior art search, and research ethics, participants will gain essential skills to conduct impactful research, safeguard their innovations, and explore opportunities for technology transfer and commercialization. This was organized on 8th to 12th December, 2025. More than 100 participants participated in the FDP.



The poster for the Faculty Development Program (FDP) is titled "FACULTY DEVELOPMENT PROGRAM ON EMPOWERING MECHANICAL ENGINEERING RESEARCH THROUGH INNOVATION AND IP AWARENESS". It is organized by the Department of Mechanical Engineering & in association with IEM HRDC, Institute of Engineering & Management, University of Engineering And Management, Kolkata. The program dates are 8th December - 12th December, 2025. The poster features logos for IEM (Institute of Engineering & Management), UEM (University of Engineering & Management), and Human Resource Development Centre (IEM). It lists four speakers with their photos, names, titles, and affiliations, along with the dates and topics of their sessions.

Speaker	Title	Affiliation	Date	Topic
Dr. Sujit Sen	Professor	Department of Chemical Engineering, NIT Rourkela	09.12.2025	From Concept to Patent: Integrating Innovation, Design, and IP Strategy in Mechanical Engineering.
Dr. B. Yogameena	Professor & Head	Educational Media and Technology, NITTTR Chennai	10.12.2025	Innovation and IPR - Capturing Creativity through Intelligent Protection
Dr. T Pavan Kumar	Principal Scientist - Chemistry & IPR, CSIR - IMMT		12.12.2025	Topic: IP for Everyone: Protect Your Work & Brand
Dr. Prabir Sarkar	Associate Professor	Department of Mechanical Engineering, IIT Ropar		
Mr. Priyadarshi Shubhakant		Central Tool Room & Training Centre (CTTC), Bhubaneswar		

CONFERENCE: INDUSTRIAL ENGINEERING & MECHANICAL POWER (IEM POWER 2025)

The Department of Mechanical Engineering, Institute of Engineering & Management (IEM), Kolkata, successfully organized the 4th International Conference on “Industrial Engineering & Mechanical Power (IEMPOWER 2025)”, bringing together leading academicians, industry experts, researchers, and students from India and abroad to discuss emerging trends, technological advancements, and sustainable engineering solutions.

The conference commenced with a prestigious inaugural ceremony, highlighted by the presentation of the “Engineering Excellence Award” (Academia) to two eminent scholars—Prof. Dr. Dilip Kumar Pratihari, Professor, Department of Mechanical Engineering, IIT Kharagpur, and Prof. Dr. Jayanta Kumar Dutt, Professor, Department of Mechanical Engineering, IIT Delhi—in recognition of their outstanding contributions to engineering education and research.

The inaugural session was graced by distinguished industry leaders, including Mr. Debajoyti Dey, AVP – ABS, Fujitsu General Private Limited and Immediate Past President of ASHRAE East India, and Mr. Shankha Bhattacharyya, CEO, Satya Aircon & Engineering Services Pvt. Ltd. A key highlight of the opening day was the keynote address by Prof. Dr. Dilip Kumar Pratihari on “Fundamentals of Drone Technology,” which offered valuable insights into emerging applications of unmanned systems in engineering.

The second day of IEMPOWER 2025 featured parallel technical sessions, chaired by experts from reputed institutions, fostering vibrant academic discussions across multiple engineering disciplines. The day also included four distinguished keynote lectures delivered by Prof. J. K. Dutt (IIT Delhi), Prof. Sudipta De (Jadavpur University), Prof. Fausto Pedro García Márquez (University of Castilla–La Mancha, Spain), and Prof. Len Gelman (University of Huddersfield, United Kingdom).

An engaging Industry Session brought practical perspectives through expert talks by Mr. Manish Tiwari, Mr. Manoj Chakravorti (Founder President, ASHRAE East India Chapter), Dr. Himadri Guha (Consultant, Author, and Former Faculty, Jadavpur University), and Dr. Arup Bhattacharya (Louisiana State University). This was followed by a thought-provoking panel discussion on “Decarbonization Pathways for Indian Industry,” moderated by Dr. Himadri Guha, with panelists Mr. Manoj Chakravorti, Mr. Krishna Kumar Mitra (President – RVC CTTC, Region XV; ASHRAE President; Lloyd Insulations), Dr. Sambhu Prasad Chakrabarty (Dean, Department of Law, UEM Kolkata), and Dr. Arup Bhattacharya.

The third and final day of the conference continued with presentations of the remaining technical papers and featured the innovative App Development Challenge, highlighting student creativity and interdisciplinary problem-solving skills. A major attraction of the day was the workshop on “Design for Decarbonization,” conducted by industry expert Mr. Niladri Mukherjee, which provided practical insights into sustainable design strategies.

The conference concluded with a valedictory session, during which Best Paper Awards were announced across all 12 technical sessions, recognizing outstanding research contributions. IEMPOWER 2025 successfully reinforced IEM Kolkata’s commitment to academic excellence, industry collaboration, and sustainable engineering innovation.

