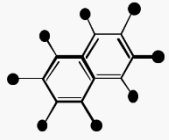




# INDIAN INSTITUTE OF CHEMICAL ENGINEERS



Dr. H L Roy Building, Jadavpur University Campus (Gate No.3), Raja Subodh Chandra Mullick Road, Kolkata 700032

## President's Corner



Dear Colleagues and Fellow Chemical Engineers,

At the outset, my greetings to you all while I connect with the fraternity as the President-2025 of IChE with much optimism and happiness. I want to take a moment to reflect on the incredible progress we have made together and to express my deepest gratitude to each one of you. Acharya Charak had said –

विद्या वितर्को विज्ञानं स्मृतिः तत्परता क्रिया ।  
यस्यैते षड्गुणास्तस्य नासाध्यमतिवर्तते ॥

"Nothing is impossible for those who have these six virtues Knowledge, Logic, Science, Memory, Readiness and Ability to function." Likewise, the path of a chemical engineer is one of constant learning, adapting, and evolving—whether through new technologies, groundbreaking research, or solving real-world problems.

The collective efforts of our fraternity have made a significant impact on industries, communities, and the environment, and I am proud to be part of this incredible journey.

In 2025, we face even more challenges and opportunities. From the transition to sustainable energy solutions and the implementation of green technologies, to developing safer materials and processes, we are at the heart of the global movement toward innovation and sustainability. Our field plays an instrumental role in shaping industries that affect every aspect of life—from healthcare to manufacturing, agriculture to transportation, and beyond.

As we continue to advance, I encourage all of us to embrace new ideas and approaches with an open mind. Our strength lies not only in our technical expertise but in our ability to collaborate, to innovate across disciplines, and to approach each challenge with a fresh perspective. It is our responsibility to ensure that we are not just engineers, but also stewards of the environment and advocates for the well-being of society.

Looking ahead, it is essential that we continue to cultivate a culture of learning and mentorship. Let us share our knowledge and experiences with the younger generation of chemical engineers, guiding them to success and fostering a community that thrives on creativity, inclusivity, and integrity. We must also prioritize diversity, equity, and inclusion, ensuring that all voices are heard and all talents are valued in shaping the future of our profession.

*Cont..*

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In 2025, let us also celebrate our successes, large and small, and take pride in the positive contributions we make every day. Let this year be one of continued growth, excellence, and collaboration. Together, we have the power to drive progress, tackle the challenges of our time, and leave a lasting legacy for future generations of chemical engineers.

Thank you for your unwavering commitment to advancing the field of chemical engineering. I look forward to all that we will achieve together in the year ahead.

**Jai Gyan ! Jai Vigyan !! Jai Rasayan !!!**



**Professor Ajay Bansal**

✉: [bansala@nitj.ac.in](mailto:bansala@nitj.ac.in)

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## IChE UPDATE

**Work is underway for building a new campus of IChE-Training Institute in Kolkata.  
The new campus will serve the purpose of carrying out research, training and consultancy.**

# ANNOUNCEMENT

## Nominations for Some IICHe Awards/Prizes for 2025

**The Institute invites nominations for IICHe Awards/Prizes for 2025, which are given in recognition of meritorious work in the field of Chemical Engineering in India. The awards/prizes are:**

- Lala Shriram National Award for “Leadership in Chemical Industry”
- NOCIL Award for “Excellence in Design or Development of Process Plant and Equipment”
- IPCL Award for “Safety/Hazard Management in Petrochemical Industry”
- ONGC Award for “Excellence in Design and Development of Oil/Gas related Process Plant and/or Chemicals”
- Hindustan Dorr-Oliver Award for “Excellence in Use of Science and Technology in Rural Development”
- Herdillia Award for “Excellence in Basic Research in Chemical Engineering”
- ICI India Limited Award for “Excellence in Process or Product Development”
- Amar Dye-Chem Award for “Excellence in Research and Development” – for Chemical Engineer below the age of 35 years as on 31st December 2024
- Jubilant Award for “Outstanding Work in the area of Green Technology”
- Lupin Industries Best Chemical Engineering Teacher Award for the Faculties in Private Colleges below the age of 50 years as on 31.12.2024
- Dr A V Rama Rao Foundations Best Ph.D. Thesis and Research Award in Chemical Engineering/Technology for the Year 2023
- Dr K Anji Reddy Innovator of the Year in Chemical Engineering and Technology in India by publishing in Reputed International Journal in Chemical Engineering & Biotechnology/ Patents of merit.
- Prof Shyamal Kanti Sanyal Memorial Award for the “Best PhD Thesis in the area of Membranes Research with Significant Commercial Potential”
- The Chemical Weekly Prize for “Best Research Paper Published in a High Impact Factor International Journal by an Undergraduate Chemical Engineering Student” (First and Second Prize)
- Padmashri Professor G D Yadav and Dr (Mrs) Vasanti G Yadav Awards for the most versatile Chemical Engineering/Technology Students in India
- Professor Ashutosh Sharma Award for the Best Research Paper Published in a National/ International Journal by an Undergraduate Chemical Engineering Student (Male/Female alternative year).
- Prof A Suryanarayana and Mrs. Vanajakshi Award for the Best Author/(s) of Chemical Engineering Book and/or Book Chapter.
- Dr Mithilesh Jha and Dr Lily Jha Award for the Best Promising Chemical Engineering Teacher below the age of 50 years.

**The forms, duly filled-in should reach the IICHe Office on or before 30<sup>th</sup> June 2025.**

- Ambuja’s Young Researcher’s Awards for Doing Post-Graduate Studies in India for the Year 2025 (10 awards)  
**The forms, duly filled-in should reach the IICHe Office on or before 31<sup>st</sup> August, 2025**

- Shah-Schulman Award ‘for the best Ph.D. thesis in the area of Colloid and Interface Science’.  
**The form, duly filled-in should reach the IICHe Office on or before 31<sup>st</sup> May 2025.**

**The Institute also invites nomination for:**

Acharya P C Ray Award (First and Second Prize) and Ambuja’s Best Home Paper or Design Project Report Award (First, Second and Third Prize)

**Nomination Forms for these two awards have to be endorsed by the Head of the Department of Chemical Engineering, of the concerned institution. Forms, duly filled-in along with the Project Report should reach the IICHe Office on or before 17<sup>th</sup> July 2025.**

**All Nomination forms for Awards and Prizes are available in the Website of the Institute ([www.iiche.org.in](http://www.iiche.org.in))**

# Obituary

## Padma Shri Dr. K.H. Gharda



With profound grief and heavy heart, the national Council of Indian Institute of Chemical Engineers (IICChE) received the news of passing of Padma Shri Dr. K.H. Gharda on 30 September 2024. A multi-faceted personality that he was, Dr. Gharda equally excelled in his role as an eminent chemical engineer, a distinguished entrepreneur, an avid scientist and innovator as well as a passionate philanthropist.

Over the years, IICChE has been privileged and proud to have the patronage and support of the late Dr. Gharda in many a different way. Indeed, it was an honour for the Institute to confer upon him the Honorary Fellowship of IICChE in the year 2001 and its prestigious B.P. Godrej Life Time Achievement Award in the year 2007.

The IICChE Council is thankful that some of its senior members had the opportunity to be present at the Memorial Meeting for the late Dr. Gharda on 5 October 2024 in Mumbai and to pay their homage to him.

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With profound grief, we announce the sad demise of our following respected Member:

**Mr. Sures Farsinavis (LM - 03511).** The late Mr Frasinavis joined IICChE in June 1973.

**We offer heartfelt condolence to the bereaved family of our departed and valued Member.**



# SCHEMCON-2024



Lighting of lamp by the guests of honour

Welcome address by Prof. Alok Kumar Singh, Director, RGIPT

Organizing committee with Guests

Dr. Sunil I. Thakkar &amp; Prof. G.D. Yadav

The 20th Annual Session of the IICChE-Students Chemical Engineering Congress (SCHEMCON-2024) was held on 20 and 21 September 2024 at the Rajiv Gandhi Institute of Petroleum Technology (RGIPT), Jais. This prestigious event was organized by the IICChE Students Chapter at the Department of Chemical and Biochemical Engineering, RGIPT in collaboration with the Amethi Regional Centre of the Indian Institute of Chemical Engineers (IICChE). The theme for this year's SCHEMCON was 'New Paradigms of Chemical Engineering.'

For the Inaugural Session on the 20th morning, the Guests of Honour were Padmashri Prof. G.D. Yadav, Emeritus Professor of Eminence and former Vice Chancellor, Institute of Chemical Technology, Mumbai; and, Ms. Sukla Mistry, Former Director (Refineries), Indian Oil Corporation Ltd. Dr. Milan Kumar, Chairman of the Local Organizing Committee (LOC) and Head of the Department, set the tone by highlighting the significance of the theme of the event. Prof. Alok K. Singh, Acting Director, RGIPT, spoke about the role of educational institutions in shaping future chemical engineers. Prof. A.S.K. Sinha, Chairman of the NOC, SCHEMCON-2024, emphasized the importance of collaborative efforts in advancing the field. Prof. Sunil Baran Kuila, Honorary Secretary, IICChE discussed the evolving landscape of Chemical Engineering in response to global challenges. The Vice-Presidents, Mr. Shashikant Pokale, and Smt. Sheela, underscored the role of the youth in driving change in the industry and the importance of research and development in achieving excellence.

The Guest of Honour Padmashri Prof. Yadav, in his speech, said, "God is a chemical engineer, but chemical engineers are not God. He also compared a mother's nurturing role to that of a chemical engineer. While emphasizing the essential contributions of chemical engineers to society, Prof. Yadav challenged the audience to name three man-made materials or products created without chemicals. The second Guest of Honour Ms. Sukla Mistry delivered her address, sharing the critical importance of adapting to evolving industry trends in chemical engineering. She encouraged students to embrace innovation and sustainability. The Guests of Honour were presented with shawls and mementos.

Highlight of the Plenary Session I on the first day was the inaugural lecture by Prof. Yadav. He focused on the importance of innovation in driving the future of chemical processes and sustainability. He emphasised the critical need for the chemical engineering sector to adapt to the emerging challenges such as climate change and resource scarcity. Following Prof. Yadav's address, Shri A.K. Sharma, a notable figure in the industry, offered his perspectives on the role of government initiatives in fostering innovation within the chemical engineering landscape. Ms. Sukla Mistry spoke about her research and on sustainable practices in chemical manufacturing, highlighting innovative strategies to reduce environmental impact. Prof. Mithilesh Kumar Jha, Director General, IICHe-Training Institute explained the integration of new technologies in chemical processes, advocating for a sustainable future through enhanced engineering practices.

The Plenary Session II on 21 September 2024 featured a series of insightful lectures by distinguished speakers, namely, Mr. S. Bharathan (Director, HPCL refineries), Mr. Rajendra Sankhe (COO, Indorama Jagdishpur), Mr. Chandrasekhar Narayanamurthy (BPCL R&D), and Prof. Nitin Kaistha (IIT Kanpur). Each brought a unique perspective on current trends and the future of chemical engineering, particularly focusing on refinery technologies, petrochemicals, and advancements in research and development.

The Plenary Session III, also held on the second day, was marked by the keynote lecture from Prof. Aniruddha Bhalchandra Pandit, Vice Chairman of ICT Mumbai and President of BoG, RGIPT. Prof. Pandit made a presentation on 'New Paradigms of Chemical Engineering' which set the stage for vibrant discussions on the future of the field. He emphasized the need for interdisciplinary approaches, advocating for a holistic view of chemical engineering that integrates insights from various scientific and engineering domains.

It was followed by two Panel Discussions, the first one, titled, 'Future Opportunities and Challenges of Chemical Engineering Education' and the second one, titled, 'New Paradigms of Chemical Engineering: Students Perspectives on their Expectations from Academia and Industry'.

The technical sessions at SCHEMCON 2024 were held over two days covering a wide range of topics in Chemical Engineering. The topics were Renewable Energy Technology, Hydrogen Energy Technology, Bioenergy and Biofuels, Waste to Energy, Energy Storage Systems and Advances in Material Science and Engineering. The poster presentations were also a key part of the event, where students from across India displayed their research and innovative ideas in chemical engineering. Held over two days, the presentations allowed participants to visually share their work through posters, focusing on the theme 'New Paradigms of Chemical Engineering.'

There were four sessions of Invited Talks. In the 1<sup>st</sup> session, Dr. Yamini Sudha Sistla, Shiv Nadar University delivered an insightful talk on her interdisciplinary research in molecular modelling, CO<sub>2</sub> capture, and biopolymer-based materials. In the 2<sup>nd</sup> session, Nishesh Garg, a Senior Advanced Technical Sales Engineer at Honeywell UOP, shared insights from his extensive experience in leading global product development projects in olefins, detergents and naphtha technology. In the 3<sup>rd</sup> session, Dr. Harish Kumar, a scientist at the Defence Materials and Stores Research and Development Establishment (DMSRDE), DRDO, presented his work on advanced materials for defence applications. In the 4<sup>th</sup> session, Dr. Sonal Maheshwari from BPCL's R&D division shared her research on crude oil analysis and refining processes.

The evening of 20 September featured Cultural Programmes. The Valedictory function commenced with a Welcome Address by Arik Parui, the Student Coordinator of SCHEMCON-2024. Following speeches by Dr. Milan Kumar, Prof. A.S.K. Sinha, Prof. Alok Kumar Singh and Shri D. M. Bhutala (former President, IICHe), the Chief Guest, Prof. A. B. Pandit, addressed the audience with an engaging presentation. SCHEMCON-2024 wrapped up with a Vote of Thanks from Dr. Deepak Dwivedi, the Joint Organizing Secretary for the event.

# 1st IICHe-ChEMATHON 2025

Organized by IICHe Training Institute at Kongu Engineering College, Erode



**R: Dr.R.Kumaraswamy, Thiru.A.K.Ilangao, Dr. Sunil Baran Kuila, and Mr. S. Gajendran lighting the kuthuvilakku**

**L: Prayer Song by Ms. Varsha along with the dignitaries and Council members on the dais**

The first edition of **IICHe-ChEMATHON-2025**, a national HACATHON, was organized by **IICHe-Training Institute (IICHe-TI)**, the **IICHe Student Chapter-Kongu Engineering College**, Perundurai (Tamil Nadu) and the **IICHe Erode Regional Centre** in association with **Indian Chemical Society (ICS)** during 28<sup>th</sup> February to 2<sup>nd</sup> March 2025. Kongu Engineering College was the host of this major event. The central theme of IICHe-ChEMATHON 2025 was ‘Redefining Progress through Sustainable Solutions,’ focusing on the urgency for adopting sustainable practices and reiterating the responsibility of engineers, scientists, and industry leaders to engage in innovations. It provided a platform to the young minds for collaborative problem-solving by offering real-world solutions. The event was inaugurated by **Dr. Abhay Jere**, Vice Chairman - AICTE & Chief Innovation Officer, Ministry of HRD, Govt. of India, and the Guest of Honor was **Mr. S. Gajendran**, President- Operations & Location Head-Mettur, Chemplast Sanmar Ltd. Dr. R. Kumaraswamy, President-KVIT Trust, Thiru. A. K. Ilango, Correspondent-Kongu Engineering College, Dr. V. Balusamy, Principal-Kongu Engineering College, Dr. Sunil Baran Kuila, Hony. Secretary, IICHe, Dr. Avijit Ghosh, Director- IICHe Training Institute, Dr. V. Sangeetha, Head-Chemical Engineering, KEC and IICHe council members were present in the function. This mega event was coordinated by Prof. K. Kannan, Chairman, Dr. S. Mothil, Secretary of the Organizing Committee of IICHe-ChEMATHON 2025.



The objective for IChE-Training Institute behind introducing IChE-ChEMATHON is to offer a platform to the professionals, researchers and students from across the country for addressing the real-world challenges in areas, such as, sustainability, process optimization and industrial innovation. Sustainability is no longer a mere concept. In today's world, it is becoming an indispensable precondition for the humanity's very survival, particularly, in the face of alarming climate change, steady resource depletion and rising industrial waste.

Drawing attention to the United Nations' Sustainable Development Goals (SDG06, SDG07, SDG09, SDG11, SDG12, SDG13), the esteemed guests and respected academics, research scholars and industry experts stressed the importance of developing practical, viable and scalable engineering solutions that would promote sustainability. Throughout the three-day event, the central refrain of the Hackathon was the importance of Chemical Engineering and allied disciplines in shaping a sustainable future for humanity across the world, based on hydrogen economy, bio-based materials, AI-driven process optimization in the industries and so on.

Each of the three days of ChEMATHON started with a yoga session, to be followed by live session of Hackathon, mentoring session and evaluation session by industry mentors from CIPET, Accenture, Thirumalai Chemicals, Sim Infosystems, WR Grace and Schlumberger. Following the final evaluation session on 2<sup>nd</sup> March 2025, 8 teams of participating students were shortlisted for the grand finale by the grand jury member, Mr. S. Stalin, Former Whole Time Director-SPIC Tuticorin. Out of these, the top three teams were awarded **the First (Rs 1,00,000), Second (Rs 50,000) and Third prize (Rs 30,000)**, respectively by Bhumistha Infra Services, Central Institute of Petrochemicals Engineering & Technology (CIPET), Indian Chemical Society (ICS) and IVL Dhunseri Petrochem Industries, Haldia.

Following the Valedictory Session, conducted by **Mrs. Vidhya Chandrasekar**, Eco Protection Engineers Pvt. Ltd., Chennai with **Mr. Dhawal Saxena**, Group CEO & CTO, Bhumistha Infra Services, Navi Mumbai and offering of the Vote of Thanks, the first edition of **IChE-ChEMATHON** came to an end on a successful note with promises to make the successive ones even more dynamic, more creative and more impactful.



# Climate Change and Sustainable Manufacturing – VI

## Sustainability through Material Conservation, Waste Management and Circular Economy

Joy M. Shah<sup>1</sup>

“We cannot solve our problems with the same thinking we used when we created them.” –  
Albert Einstein

### Introduction:

India ranks seventh globally in Solid Waste Generation (SWG). The present rate of SWG in India is 0.34 kg per capita per day, which is expected to increase to 0.7 kg per day by 2025. India will generate 165 million tonnes of waste by 2030. Out of 8 million tonnes of plastic waste in the world's oceans, the Meghna-Brahmaputra-Ganges river system dumps close to 73 thousand tons, making it the 6th most polluting river system contributing to marine plastic waste in the world. These are some of India's shocking statistics regarding waste scenario, taken from the government web site.

With Self-Reliant India, the aim is to make the country and its citizens independent and the vision is firmly rooted in sustainability. Moreover, the Material Conservation, Waste Reduction and Recycling as well as Circular Economy is no longer a choice for India. With a rising population, urbanization, environmental challenges and international commitments, shifting towards a circular economy has become imperative for India.

The circular economy presents an economic approach focused on minimizing/eliminating wastage while promoting the optimal use or complete reuse of resources. It emphasizes the significance of embracing a holistic view of products and processes. We need to embrace practices aligned with the principles of the circular economy to enhance industrial productivity, competitiveness and efficient use of the resources. The circular economy is also a key pillar of the Mission Lifestyle for Environment (LiFE), proposed by Prime Minister Narendra Modi to the global community, which aims to encourage individuals to adopt environmentally friendly sustainable lifestyles.

Circular Economy is the need of the hour and it advocates adopting the 7Rs of the circular economy, encompassing Reduce, Reuse, Recycle, Redesign, Remanufacture, Refurbish and Repair. These principles should guide the design of new products, new systems, new ventures, business parks and industrial clusters. Industries need to participate, not only to achieve material conservation and waste reduction but to ensure circular economy for their products and processes while design, operation, maintenance as well as use life and end of life of their products.

### 1. Material Conservation and Recyclability:

In the resource-hungry world, in the past 50 years, humans have consumed more resources than they have in all previous history. Between 1970 and 1995 alone, worldwide consumption of raw materials (not including food and fuel) doubled. Since the late 1980s, our human footprint has exceeded the Earth's bio-capacity. It is essential to Decouple Economic Growth from Natural Resource Consumption and Negative Environmental Impacts. Therefore, material conservation and recycling of materials are essential. It has the following advantages.

1. Conservation of natural resources
2. Reduced demand for raw materials, hence, reduced impact on the environment
3. Increase in energy conservation and reduction in greenhouse gas emissions
4. Reduction of waste, and, thereby, landfilled waste
5. Reduction of cost of manufacturing

For example, metal recycling is considered the easiest one but we have not achieved more than 50% recycling with its availability of 50 to 100 years if we continue consume at present rate. We should be proud that India is leading in recycling efforts but we need to convert recycling as an integral part of modern society.

The following approach is suggested for Material Conservation and Recyclability.

1. Design for Material Conservation and Recyclability. i.e. high yield and high selectivity of main product, alternate raw material, high recycled product as a feed
2. Prepare material flow, Technology upgradation for raw material conservation and reduce by-product and waste product formation.
3. Maximise use of recycled raw material and reduce virgin material in existing system.
4. List out all consumable used in manufacturing and prepare road map for its reduction, reuse and recycle as well as its inventory tracking and control.
5. Refuse, Reduce and Recycle packaging material.
6. Employee involvement and Capacity building for material conservation and recyclability as well as waste reduction

## 2. Waste Management:

There are three types of waste, viz., Solids, Liquid and Gaseous. The efforts are required to achieve zero waste to land fill, zero liquid discharge as well as 100% compliance to legal requirement for all the types of waste. Typical waste classification and recommended disposal apart from recovering fuel value and safe land fill can be as follows:

Major Classification	Sub Classification	Type of waste	Recommended Method of Disposal		
			Reduce	Reuse	Recycle
Hazardous Waste	Liquid	Waste oil	Yes	Yes	Yes
		Effluent Water	Yes	Yes	Yes
	Solid	Chemical Sludge from ETP	Yes		Yes
		Process Sludge / spent catalyst	Yes		Yes
		Oil Soaked material	Yes	Yes	Yes
		Empty Drums and Barrels	Yes	Yes	Yes
		E-Waste	Yes	Yes	Yes
		Scrape battery	Yes	Yes	Yes
		Bio medical Waste	Yes		
Mixed waste	Yes				
Non Hazardous Waste	Metallic Waste	Ferrous – MS, SS, Casting	Yes	Yes	Yes

Major Classification	Sub Classification	Type of waste	Recommended Method of Disposal		
			Yes	Yes	Yes
		Non Ferrous – Brass, Aluminum, Copper	Yes	Yes	Yes
	Non Metallic Waste	Wooden	Yes	Yes	Yes
		Paper	Yes	Yes	Yes
		Canteen Waste	Yes		
		Bio degradable Garbage	Yes		
		Non Bio degradable Garbage	Yes		
		Plastic and packaging material	Yes	Yes	Yes

To ensure effective waste management system, the following approach is suggested for solid waste.

1. Collection
2. Segregation
3. Internal transport & handling in Wealth yard (Not Scrap yard or waste yard)
4. Segregated Storage
5. Inventorisation
6. Set target for reduction
7. Identify reuse and recycle options
8. Recover valuable material from waste
9. Recover calorific value as an alternative fuel
10. safe disposal of residue

Whereas for liquid waste, the following 3-pronged approach is suggested after recovery of reusable materials from wastewater:

1. Segregate waste streams, based on quality of waste water generated
2. Treat as appropriate (Primary, Secondary, Tertiary)
3. Recover and reuse in process (low & high end applications)

Waste management system to ensure the following:

1. SOPs, waste path and clearance frequencies are defined.
2. The equipment for waste management such as bins, trucks, compactors, ETP/STP must be maintained as per schedules provided by the OEM.
3. Waste management yard must have demarcated storage for hazardous waste and secondary containment for handling liquid spillage.

### 3. Circular Economy:

As per Andrew Morlet, “Recycling alone will not save us.” Circular economy is a “bigger idea” — a significant restructuring that forces us to rethink how we’ve done things since the rise of the first steam engine.

With circular economic activity, waste is reduced to a minimum because everything produced is transferred and used somewhere else, continuously. In a circular Economy, nothing is lost, everything is transformed.

According to the [World Economic Forum](#), a circular economy is “an industrial system that is restorative or regenerative by intention and design”. Regeneration means products and services in a circular economy contribute to systems that renew or replenish themselves throughout various lifecycles and uses.

How does the circular economy works?

1. **Design out waste and pollution** - Circular economy designs out all the activities that negatively impact human health and natural systems. This includes the release of greenhouse gases, all types of pollution etc., e.g., Renewable power generation

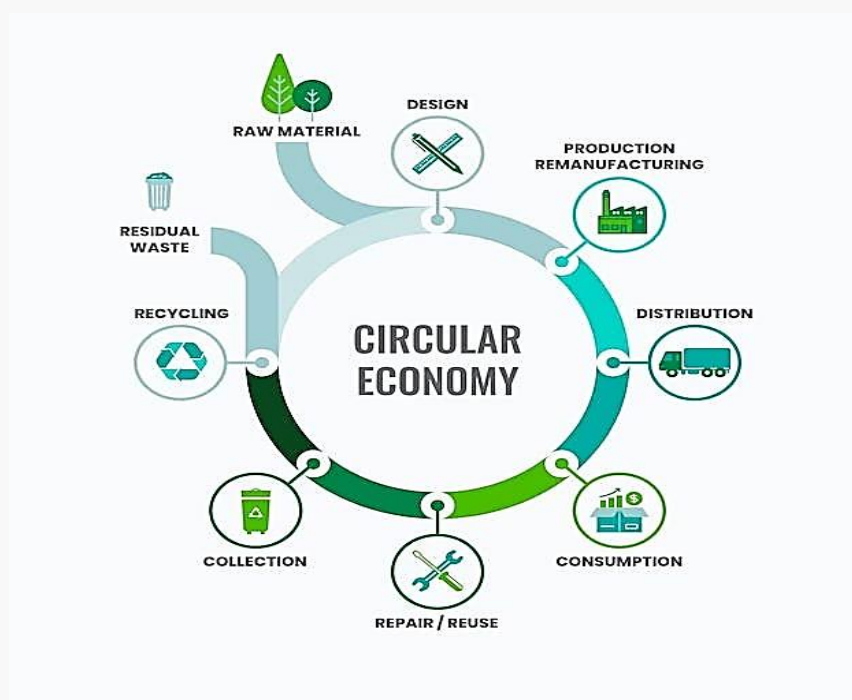
2. **Keeps products and materials in use** - Circular economy favours designing products for durability, reuse, remanufacturing, and recycling to keep materials circulating for as long as possible. It is an economy that encourages many different uses for materials instead of just using them up. For example, reusable packaging, buy back and reusing consumer goods
3. **Regenerates living systems** - Circular economy avoids the use of fossil fuels and non-renewable energy. By preserving and enhancing renewable resources, it returns valuable nutrients to the soil to support regeneration and actively improve the environment. – e.g. Bio Chemicals and Bio agro-chemicals.

Today humanity uses the equivalent of 1.6 Earths to provide the resources we use and absorb our waste. Resources are finite, therefore, shifting from linear economy to circular economy is essential where waste streams are eradicated with true and regenerative design. **In circular economy, Waste should be considered as the material at wrong place and to be minimised.**

Circular economy is the need of the hour due to the following reasons:

1. Preparation for Upcoming Legislation, such as, EU DPP
2. Responding to Stakeholder Pressures, such as, accessing finance
3. Responding to shifts in Consumer Behaviour
4. Responding to Brand Demand
5. Developing a forward-looking brand, built on sustainability principles

Circular Economy is depicted in following picture.



To clear the idea, some of the examples of circular economy practised are listed below.

**Automotive:** Initial design for remanufacturing, Alternate ownership, Car-sharing, leasing of batteries, Collect and regroove tires for resale.

**Consumer goods:** All-purpose cleaner made from common organic chemical compounds, scientifically [derived](#) from food waste, stainless steel razors that provide years of use along with a “[Blade Take Back Program](#)” that upcycles used blades into new products.

**Fashions:** 100% recyclable clothing and SWAP program, Take back program to remanufacture clothing from R-PET.

**Food:** Surplus food pick up services.



**Furniture:** Recycle of furniture to low priority buyers.

How can we apply circular economy models to Chemical and High hazards industries?

Normally chemical and petrochemical industries are once through process. However, we can start this concept from small area to show our commitment and expand the same. The following approach can be tried.

1. Reusable drums, ISO containers and take it back after its chemical is used.
2. Increase use of recycled plastic proportion and replace virgin plastic.
3. Use of Renewable energy for manufacturing
4. Explore manufacturing of Bio chemicals and replace petrochemicals
5. Catalyst and process upgradation to reduce waste or recover waste for value added products.
6. Recover chemicals and catalyst from users where shelf life or its useful life is over.
7. Energy reduction in process by process intensification
8. Separation of value added chemicals from sludge and waste to recover and recycle.
9. Produce more chemicals per drop of water
10. Look for regenerative processes and equipment, e.g., Regenerative Thermal Oxidiser
11. Invention and innovation to stop waste generation and reuse of chemicals multiple times.

**"India is making the circular economy a major tool for urban development." Prime Minister Narendra Modi, Post-budget webinar speech, 2023.**

I am sure that Professional Chemical Engineers will appreciate their role to actively take up the concept of material conservation and Recycling, Waste management as well as Circular economy sustainable manufacturing to reduce virgin material consumption.

**<sup>1</sup>The author is the Founder and Chief Consultant, Innov8 ProTech Solutions, The Sustainability and Management Consultant. Formerly, he was Sr. Vice President (Head - Technical) at Reliance Industries Ltd. He is also a member of the IChE Chemical Process Safety, Energy and Environment Committee since 2018. For the last six years, he has been consulting for Energy and Water Management, Green company advisor and branding for Sustainable Manufacturing as well as Process Safety and Risk Management.**

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## Regional Centre Activities

### Amaravati Regional Centre

A national Webinar, titled, ‘Circular Economy Approach for Mitigation of Plastic Waste Challenges,



**Opportunities, and Future Prospects’** was organized by Amaravati RC on **7 October 2024** in hybrid mode in association with all the Student Chapters (SCs) under aegis of Amaravati RC. It was hosted by National Institute of Technology (NIT), Andhra Pradesh (NIT-AP). The event served as a platform for experts to share their insights into the cutting-edge technologies, successful case studies and innovative business models that support sustainable plastic waste management.

The Webinar was inaugurated by the Chief Guests, **Smt. Sheela**, Vice President, IICChE and Former Deputy Chief Executive, Nuclear Fuel Complex, Hyderabad and **Prof. B. S. Murthy**, Officiating Director, NIT, Andhra Pradesh. **Mr. J Murali Mohan**, Chairman, Amaravati RC and Vice President, RVR & JC College of Engineering (A) conducted the inaugural proceedings. **Prof. N. Balasubramanian**, Honorary Treasurer, IICChE, and **Mr. Dhawal Saxena**, Honorary Registrar, IICChE were present as the Guests of Honour. **Dr. P. Dinesh Sankar Reddy**, Associate Professor, Dept. Chemical Engineering, NIT-AP graced the inaugural function as the Special Guest. **Dr. Vinoth Kumar Raja**, HoD, Department of Chemical Engineering, NIT-AP welcomed the guests and participants. **Prof. V. Govardana Rao**, Former Professor, IIT Bombay and Immediate Past Chairman, Amaravati RC briefly explained the importance of the webinar and encouraged the student community to engage in sustainability-driven research and innovation in handling the plastic waste.

The Webinar was spread into three sessions – Morning (Session I), Afternoon (Session II) and Evening (Session III). In the Morning Session, **Dr. Sunil Pandey** and **Dr. Prakash P. Wadgaonkar**, Emeritus Scientist at CSIR-NCL, Pune, made presentations on various aspects of Plastic Waste Management and the Need for Development of Sustainable Alternatives. The Afternoon session featured **Dr. Gourhari Chakraborty**, Ad-hoc Faculty at NIT-AP, **Dr. Mohanraj P.** and **Dr. Sanat Kumar**, Chief Scientist and Head of Upstream and Wax Rheology Division at CSIR-Indian Institute of Petroleum, Dehradun. **Dr. Virendra Kumar Gupta**, Head of R&D Polymer and Senior Vice President at Reliance Industries Ltd., was the principal speaker for the Evening session. Each session was followed by an interactive Q&A segment.

The Webinar, which had 599 registered participants, including 100 offline (students, faculty and working professionals), concluded with a closing address by **Dr. Dinesh P. Shanker Reddy**. **Dr. M. Venkateswara**

Rao, Honorary Secretary, Amaravati RC and Organizing secretary for the Webinar proposed the vote of thanks.

**Prof. M. Venkateswara Rao Third Endowment Lecture** was delivered on **18 February 2025** in hybrid mode. The endowment lecture was delivered by **Prof. Jagadish Chennupati**, President, Australian Academy of Science on the topic, Semiconductor Nanostructures for Optoelectronics, Energy, Sensor, and Neuroscience Applications. **Chief Guest** for the event was **Prof. Ajay Bansal**, President, IICHE and **Guests of Honour** were **Prof. Parag R. Gogate** and **Prof. R. Parthiban**, Vice Presidents, IICHE.

The event was organized by the Amaravati RC in association with all the Student Chapters under it and hosted by Rajiv Gandhi University for Knowledge Technologies, Nuzvid.

## Bhubaneswar Regional Centre

Bhubaneswar Regional Centre, IICHE and CSIR-Institute of Minerals and Materials Technology (CSIR-



IMMT), Bhubaneswar, organized a **Seminar, ODICHEM-2024** on **18 and 19 October 2024** on the theme, **‘Technological Challenges in the Mineral Sector’**. The Chief Guest, **Dr Raghavendra Tewari**, Outstanding Scientist & Director of Materials Group, Bhabha Atomic Research Centre, inaugurated the seminar, explaining the energy scenario in India and the changing role of critical minerals. **Mr. Pankaj Kumar**, Deputy Director General, Geological Survey of India, was the Guest of Honour, who presented a clear geological picture of Odisha, highlighting

the prospects of industrial development, especially related to the critical minerals. The Chairman of the Organizing Committee, **Mr. D. P. Misra**, a veteran Chemical Engineer of Odisha and a consultant to several chemical enterprises, welcomed all the industry leaders, association heads and their members, especially, the investors from the mineral sectors, to come and made a presentation on Odisha as their next investment destination. **Dr. Ramanuj Narayan**, Director, CSIR-IMMT, Bhubaneswar, narrated the industry-oriented research activities taken up by the Council of Scientific and Industrial Research (CSIR) and CSIR-IMMT, particularly for the mineral sector.

Senior executives from a diverse range of industries, including, OMC, IREL Ltd., Lohum Industries, UCIL, BARC, HINDALCO, MINTEK (South Africa), MIDREX India, Lloyds, JSPL, GSI, Tata Steel, Excel Industries, NALCO, Essar Minmet Ltd., CSIR-IMMT, and CSIR-CIMFR, presented their observations at the seminar through specially curated keynote and invited talks. These presentations primarily focused on the challenges and opportunities in the mineral sector with an emphasis on critical minerals as well as ferrous and non-ferrous minerals. Critical issues, such as, resource depletion, environmental sustainability and technological advancements in mineral extraction and processing were discussed elaborately.

With around 200 delegates from industries, academia and R&D organizations attending the event, in course of the two-day seminar, ODICHEM-2024 successfully addressed the technological challenges and opportunities in the mineral sector, focusing on sustainability, advanced extraction technologies. The seminar highlighted the importance of innovative solutions for resource management and environmental responsibility, with Odisha positioned as a key player in India’s mineral landscape.



As part of ODICHEM-2024, the second **Er. D. P. Misra Distinguished Oration** was delivered by **Mr. Ashwin Shroff**, Executive Chairman of Excel Industries Limited, Mumbai on **18 October 2024**. The **Er. D. P. Misra Distinguished Oration** is an annual programme, instituted by the Bhubaneswar RC in 2023, to honour the important contributions of **Mr. D. P. Misra**, former President, IICChE and Former Deputy Managing Director, Jacobs Engineering India Pvt. Ltd. to the chemical sector over several decades.



## Calcutta Regional Centre



**Engineers' Day** was celebrated on **14 September 2024** by Calcutta RC. Following welcome speech by **Mr. Shisir Chakraborty**, Hony. Secretary, Calcutta RC to the invitees, the CRC members and the UG students of the Dept. of Chemical Engineering, Jadavpur University, the **Engineers' Day pledge** was administered by **Dr A.K. Ray**. A Seminar for the students was organised on the occasion **with Dr. Ranjana Das**, Dept. of Chemical Engineering, Jadavpur University presiding over. Students from 2nd, 3rd and 4th year made presentations. Three top presenters were given away the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> prize. At the end of the

programme, **Prof. Sudip Das**, Vice Chairman, Calcutta RC offered Vote of Thanks.

Floral tributes were paid to the bust of **Dr H. L. Roy** on his **Birth Anniversary on 2 November 2024**, which was attended by a few of the IICChE office bearers, EC members of Calcutta RC, IICChE Members and Staff of the IICChE Headquarters office.



On **6 December 2024**, Calcutta RC organised a national **Seminar**, titled, '**Prospects of Green Hydrogen Technology in India**'. The introductory speech was made by **Mr. K.K. Basu**, Chairman, Calcutta RC, welcoming all the attendees, specially, the Guests of Honour, **Padmashri Prof G.D. Yadav**, Former VC, Institute of Chemical Technology, Mumbai and former President, IICChE as well as **Dr Bikramjit Basu**, Director, CGCRI, who delivered a speech at the beginning. **Prof. S.B. Kuila**, Hony. Secretary, IICChE also addressed the gathering.





In his Keynote Address, Prof. Yadav extensively discussed the applications and usages of Green Hydrogen Technology. He also highlighted the impending environmental and climate change issues. Three technical sessions were held in which seven speakers, including two speakers from Mumbai, made online presentations, analysed various aspects of production, consumption, export, new age technology, safety and sustainable development, application of hydrogen in various sectors of industry and so on.

**Dr A. Mondal**, Oil Industry Specialist, conducted the valedictory session while **Mr T. Pal**, Convener of Seminar Committee, offered the Vote of Thanks.

### Northern Regional Centre

A **Technical Seminar** was organized on **13 July 2024**. The event started with **Mr. Rajiv Narang**, Honorary Treasurer, Northern RC and Executive Director, Process Economics Program, S&P Global, welcoming the eminent speakers, members and participants. He also gave a brief introduction of the speakers.

**Ms. Rathi R**, Research Analyst, Process Economics Program, S&P Global Commodity Insights, presented a paper on '**PFAS (The Forever Chemicals): A Profile**'. **Dr. Siddhartha Mukherjee**, Honorary Secretary, IICChE (NRC) & Ex-Director (Technology), Air Liquide Global E&C Solutions, presented a paper on '**Tutorial on Tray Sizing**'. **Mr. T.P.V. Ranganadham**, Senior Manager, Research and Development, UOP Honeywell, presented a paper on '**Liquid Organic Hydrogen Carriers**'.

**Mr. C.P. Srivastava**, Vice-Chairman, Northern RC delivered the concluding remarks and offered vote of thanks.

On **7 September 2024** and **5 October 2024**, respectively, the monthly programme of **Library Day** was held. At the **7 September** programme, **Dr. Siddhartha Mukherjee**, Honorary Secretary, Northern RC and former Director (Technology), Air Liquide Global E&C Solutions India Pvt. Ltd., presented a paper on '**Executing a Chemical Process Plant**'. **Mr. Subash Tandon**, Member, Northern RC gave a talk on '**Why Should we Study Chemical Engineering?**' Besides the EC members of Northern RC, students from Indian Institute of Technology (IIT) Delhi, Delhi Technological University (DTU), University School of Chemical Technology-

GGSSIP University-Delhi and Deenbandhu Chhotu Ram University of Science & Technology, Murthal attended the event.



At the **5 October programme**, **Mr. Dinesh Chopra**, Chairman, Neochem Technologies & Ex-Honeywell, BASF, ICI, etc. and Member, Northern RC, presented a paper on ‘**New Product Introduction - from Ideation to Market**’. Other than the EC members of the Northern RC, students from IIT Delhi, Delhi Technological University (DTU) and University School of Chemical Technology-GGSIP University-Delhi were present at the programme.

Lovraj Kumar Memorial Trust **Webinar** was organised on **24 December 2024** in which Northern RC was an associate along with Federation of Indian Petroleum Industry (FIPI). The Welcome Address was delivered by **Mr. Alok Perti**, Former Secretary, Ministry of Coal, Govt. of India and Trustee, Lovraj Kumar Memorial Trust (LKMT) and the Chairman’s Address by **Mr. B.K. Chaturvedi**, Former Cabinet Secretary, Govt. of India & Chairman, LKMT. The theme of the Webinar was ‘**Sustainable Future through Carbon Markets.**’

Speakers included **Mr. R.R. Rashmi**, IAS (Retd.) (**Evolving Carbon Market: Can it help Industries Decarbonise?**); **Mr. Roshan Lal Tamak**, Executive Director & CEO - Sugar Business DCM Shriram Ltd., New Delhi (**Carbon Footprint reduction in the Agriculture/Industry Sector**); **Dr. Ashok Kumar**, Deputy Director General, Bureau of Energy Efficiency, New Delhi (**Development of Indian Carbon Market**); and **Ms. Agamoni Ghosh**, Manager, Carbon Markets Pricing APAC, S&P Global Commodity Insights, Gurugram (**Carbon Markets – Scope & Growth**).

**Prof. K.K. Pant**, Director, IIT Roorkee, Professor, Department of Chemical Engineering, IIT Delhi; and Trustee, LKMT summed up the event at the end and offered Vote of Thanks.

## Student Chapter Activities

### Gayatri Vidya Parishad College of Engineering, Visakhapatnam

An online **Faculty Development Programme** in collaboration with IICChE-Training Institute was held during **11 – 15 November 2024** on ‘**Chemical Process Simulation Using DWSIM.**’ The objective of the programme was to equip participants with the knowledge and skills of how to effectively use DWSIM, an open-source chemical process simulator, in their teaching and research. In this programme, lectures were delivered to explain the significant features of the simulator and simulation. Moreover, the participants gained hands-on experience with DWSIM, learning how to effectively incorporate it into their curriculum to enhance their understanding of process design and simulation.

### Pravara Rural Engineering College, Loni

**ChESA** was organised on **26 September 2024** on the occasion of **Engineers’ Day**. The programme started in the presence of the Chief Guest and Principal, **Dr. S.M. Gulhane** and HoD, Department of Chemical Engineering, **Dr. S.A. Misal**.

ChESA included events, such as, **Quiz Contest** and Fun Game, titled, **Guess Who**. A total of 48 students participated who were divided into 16 groups. The objective of the programme was to enhance the students’ ability to ask strategic questions and improve their observational skills. Certificates were given away to the first three rankers.

### RVR & JC College of Engineering, Guntur

**Chemical Engineering Contest for Knockout-2024 (ChECK-2024)** was organised on **16 February 2024** and on **28 December 2024**, respectively, for two consecutive academic sessions. The contests were held in association with the Amaravati RC.

The theme for the **February 2024 ChECK** was ‘**Innovative Technologies in Chemical Engineering**’. Under the umbrella of ChECK, events, such as, **Technical Paper presentations, Elocution** and **Group discussion competition** were held. As many as 116 students from various colleges took part in these events.

Twenty-eight students participated in **Paper Presentation I and II**. The event was followed by a **Group Discussion** competition for which the number of participants was 22. The final event was **Elocution Competition** with 26 students taking part in it.

The theme for the **December 2024 ChECK** was ‘**Emerging Trends in Chemical, Pharmaceutical, Energy and Environmental Engineering**’. The programme, which had a total of 195 participants from various institutions, comprised events, such as, **Technical Paper presentations, Elocution, Group Discussion** and **Technical Quiz Competitions**.





The first event was the presentation of **Technical Papers**. As many as 34 papers were presented by 58 participants. Next came a **Group Discussion** in which 38 students participated. The third event was **Elocution Competition** in which 22 students took part. The last event of ChECK-2024 was **Technical Quiz**. There were 28 teams for the quiz, each team comprising two students.

Programmes at both the February and December ChECK came to an end with **prize distribution ceremony**. For each category of the events, **1st, 2nd, 3rd** and **consolation prizes** were given away along with certificates to the winners.

## Sri Venkateswara College of Engineering, Sriperumbudur

**CHEMINNOTHON '24**, a 24-hour **National Hackathon**, was organised on **18 and 19 October 2024**. The IICChE Student Chapter of SVCE organised the event in association with the AIChE Student Chapter. Students from various streams, such as, Chemical Engineering, Biotechnology, AI&ML technology, etc., came under one banner to present their engineering innovations in Chemical Engineering and allied fields. Thrust areas included Chemical Engineering Kinetics, Process Equipment Design, Computational Fluid Dynamics, Industrial Safety, Bioengineering, Gene Therapy, AI & ML in Chemical Engineering, CO<sub>2</sub> reduction and carbon capture, Renewable Energy Engineering and Technology, Wastewater Treatment, Air Pollution Control, etc.

The Department of Chemical Engineering, SVCE publishes a monthly newsletter, *The Catalyst*. Volume-IV, Issue I, 2025 of the Newsletter has been published recently. Besides explaining the vision and mission of the department, the newsletter highlights the Programmes offered at the B.Tech, M.Tech and Ph.D levels, Research Outcomes, Co-curricular and Extra-curricular activities, available Infrastructure, etc.

**PANSOPHY 2025**, a National-level **Technical Symposium**, was held on **22 February 2025**. The objective of the symposium was to highlight advancements of innovation in Chemical Engineering and related fields while promoting collaboration among the students from various institutions. The Chief Guest for the inaugural programme was **Mr. A. Ramasubramanian**, Associate Vice President, Process, Technip Energies India Ltd. Chennai while the Chief Guest for the Valedictory function was **Mr. V. Ganesan**, Head-Health, Safety, Environment and Sustainability), Amara Raja Industries, Tirupati.



## G H Patel College of Engineering & Technology, Vallabh Vidyanagar

**Prof. M. N. Vyas**, Adjunct Professor at D D University, delivered a **Lecture** on ‘**Introduction and Overview of Plant Design and Development**’ on **8 August 2024**. The objective of the talk was to enhance the students' understanding of plant design and development, facilitate engagement with industry experts and promote practical application of various concepts in Chemical Engineering while understanding the challenges involved in the design and economic evaluation of chemical plants.

Prof. Vyas, delivered an insightful lecture on the fundamental aspects of plant design and economics. The talk provided the final year Chemical Engineering students with a foundational understanding of the principles and presented real-world case studies and examples, which helped students relate theoretical knowledge to practical applications. The session concluded with a Q&A session, where students had the opportunity to engage with Prof. Vyas and clarify their doubts.

The event witnessed active participation from Chemical Engineering students, who found the session to be highly informative and beneficial for their academic and professional growth.

On **12 August 2024**, the Department of Chemical Engineering, in association with IChE Student Chapter GCET; Institution's Innovation Council (IIC) and SSIP GCET, organized an event titled, ‘**Achieving Value Proposition Fit & Business Fit with Interview Excellence**,’ which was open exclusively for the Chemical Engineering students.



The event was divided into two sessions. The first session featured an **Expert Talk** on ‘**Achieving Value Proposition Fit and Business Fit**.’ **Mr. Aakash Gandhi**, Assistant Manager at Rallis India Ltd. and **Mr. Dipen Parmar**, Agile Practitioner & Millet Entrepreneur, shared their insights regarding aligning skills with industry expectations and the importance of agility in business practices. **Dr. Mandar Kapil Karve**, Assistant Professor, Chemical Engineering Department concluded the first session, focussing on **Interview**

**Excellence**. The second session of the event was a **Mock Interview Workshop** for the final-year Chemical Engineering students. The mock interviews were conducted by the expert panel, including, Dr. Karve, who provided personalized feedback to each student. This interactive workshop was particularly beneficial to the students, helping them identify areas for improvement and boosting their confidence for real interviews.

An **Expert Talk** on ‘**Tools for Robust Design**’ was held on **13 August 2024**. The Guest Speaker for the session was **Mr. Himanshu Shrimali**, Product Development Manager, IDMC Ltd., Gujarat, who delivered an insightful lecture on the fundamental aspects of tools for robust design. He offered an overview of robust design, emphasizing the importance of considering both technical and economic factors while using the tools. He offered real-world case studies and examples, which helped students connect theoretical knowledge with practical applications. The session concluded with a Q&A session, where students had the opportunity to engage with Mr. Himanshu Shrimali and clarify their doubts.

A one-day programme, titled, **Catalyst & Catalysis**, was organised on **14 August 2024** which comprised lectures by two eminent experts in the field of Catalysis, namely, **Dr. Aliakbar Vora**, Manager at Sud

Chemical Ltd., Nandesari and **Dr. Ashish Unnarkat**, Associate Professor, PDEU, Gandhinagar. Lectures were followed by interactive sessions.

**Expert Talk** was presented on **25 September 2024** by **Prof. M. N. Vyas**, Adjunct Professor, D D University (Topic: **Scope & Future Perspective of Chemical Engineers in Chemical Process Industries**).

The following two **Industry Visits** were undertaken for the students: **J K Fertilizer, Vasad** on **15 October 2024** and **Epigral Limited (formerly Meghmani Fine Chemical Limited), Dahej** on **19 October 2024**.



### Government Polytechnic, Valsad



**National Engineer's Day** was celebrated on **24 September 2024**. The programme was inaugurated in the presence of Chief Guest, **Mr. Shashikant Pokale**, Vice-President, IICChE and Chairman IICChE Vapi RC; **Dr. H.M. Bhatt**, Chairman & MD, Precitech Laboratories Pvt. Ltd. Vapi; and **Mr. Vinod Kashalikar**, Treasurer, IICChE Vapi. Mr Pokale spoke about Engineer's Day celebration and motivated the students of Chemical Engineering. **Mr. Mehul Deshpande**, one of the faculty members, spoke on Narrowing Gap between

Industry and Diploma Engineering Students. The Chemical Engineering students participated in activities like **Role Play, Essay Writing, Competition** and **Small Drama**, revolving around the concept of safety in chemical industries.

A **Seminar on Sensitization of National Education Policy-2020** was held on **8 August, 2024** in which Student Members of IICChE, Faculty members and Heads from various departments of the host college, Faculty members from other educational institutes, Industry delegates and the EC members of the Vapi Regional Centre of IICChE participated. The ethos of the New Education Policy (NEP)-2020, i.e., promotion of quality education that is accessible, equitable and inclusive, were explained in detail at the seminar. **MoUs** were also signed between different industries at the one hand and the Departments of Chemical and Mechanical Engineering on the other.

### Jagarlamudi Kuppuswamy Choudary College, Guntur

An **international Workshop** on '**Production and Utilisation of Green Hydrogen for Sustainable Development**' was held on **6 February 2025** in collaboration with Amaravati RC, IICChE. The objective of the workshop was to facilitate a comprehensive understanding of **Green Hydrogen**.



The workshop was inaugurated by the Chief Guest, **Dr. Bodedla Govardhana Babu**, Research Assistant Professor, Hong Kong Polytechnic University, Hung Hom, Hong Kong. **Dr V. Govardhana Rao**, former Vice Chancellor, Vignan's Foundation for Science, Technology and Research (Deemed to be University) and immediate past Chairman, Amaravati RC graced the inaugural function as the Special Guest. **Dr. N. Madhavi**, Head, Department of Chemistry (PG), JKC College & Organizing Secretary of the workshop and **Prof. M Venkateswara Rao**, former professor, Chemical Engineering & Dean Examinations, RVR&JC College of Engineering (A) as well as Honorary Regional Secretary, Amaravati RC welcomed the guests and participants.

**Technical Session I** was presided over by **Prof. M.V. Rao**. The highlight of the session was a lecture by **Dr. Bodedla Govardhana Babu**, explaining the latest developments in fuel cell technology and the challenges in integrating them with renewable energy sources. **Technical Session II** was presided over by **Dr V. Govardhana Rao**. The speaker of the session was **Dr. Jaidev Kaushik**, Assistant Professor, Department of Chemistry, SRM University, Andhra Pradesh who delved into the importance of Green Hydrogen, Green Chemistry and Challenges in Scaling Green Hydrogen production processes. He also talked about environmental sustainability by following Green Chemistry principles. Both the experts discussed various methods of green hydrogen production, including, electrolysis, powered by renewable energy and addressed the technical and economic hurdles in scaling up production to meet the future demands.

Next came presentation of the **Technical papers**. Papers on various aspects of the central theme, such as, **Hydrogen Fuel Cells, Integration with Renewable Energy Systems, Green Hydrogen, Carbon Footprint Reduction**, etc., were presented both orally and through posters. This was followed by an interactive session. The workshop witnessed active participation by students as well as faculty members and researchers from various institutions, numbering around 350.

## **Madan Mohan Malaviya University of Technology, Gorakhpur**

### **Industry Visits:**

i. To **Yash Pakka, Faizabad** on **9 August 2024** for 40 students along with the technical staff and two Faculty members. The students were guided and shown around the manufacturing process of different types of packaging paper at the plant.





ii. To **Gallantt Gorakhpur** on **26 September 2024** for 29 students, who went around the steel and cement manufacturing units, quality control and automation departments. Students observed production processes like induction furnaces and re-rolling mills. The tour emphasized industrial standards and advanced technology, bridging theory and practice.

iii. To **Lord Distillery, Ghazipur** on **6 November 2024**. The students observed ethanol production from rice starch, by-product utilization for cattle feed and wastewater treatment.

They had the opportunity to witness industrial-scale operations, thereby linking theory with practice and learning about sustainability in action.

### Expert Talks:

i. On **Production of Ammonia (28 September 2024)**, delivered by **Mr. Nikhil Awasthi**, Process Engineer, KFL Shahjahanpur. The talk was presented online.

ii. On **Process Control Domain (IT/OT) Cyber Security (5 October 2024)**, delivered by **Mr. Gajendra Patil**, Senior IT Operational Manager, Shell Pvt. Ltd. The talk was followed by an interactive session.

iii. On **Ceramic Raw Materials BIS Standards (23 October 2024)** by **Mr. Chandrakesh Singh**, Joint Director, BIS.

iv. On **Sustainable Energy Sources (15 November 2024)** by **Prof. Vimal Chandra Srivastava**, IIT Roorkee. The talk was presented online.

v. On **PEM Electrolysers in Hydrogen Production (1 December 2024)** by **Dr. Vinod Kumar Shahi**, Former Chief Scientist, CSIR-CCSMCRI.

vi. On **Role of Chemical Engineers in Semiconductor Industry (1 December 2024)** by **Mr. Shantanu Patil**, General Manager of UHP Technologies Pvt. Ltd.

### Workshops:

i. On **MATLAB** from **23 to 28 September 2024**. Led by **Dr. Vitthal L. Gole** (Professor & Head, Dept. of Chemical Engineering) and **Dr. Jyotima Kaunoja**, the workshop trained 32 participants, including students and researchers, on MATLAB fundamentals, matrix operations, process simulation, and optimization. It emphasized hands-on learning through real-time problem-solving.

ii. On **AspenTech** during **4 to 8 October 2024**. Supervised by **Dr. Prateek Khare** (Assistant Professor, MMMUT) and guided by **Dr. Vivek Kumar** (Assistant Professor, RGIPT), the workshop covered AspenTech software basics, process modeling, simulation and optimization.

iii. On **MS Office and AI** during **21 to 23 October 2024**. The workshop provided hands-on training in advanced MS Office tools and the basics of artificial intelligence.

A **Poster Presentation Competition** was organized on **9 November 2024** for the final-year students and a **Project Poster Competition** was organized on **12 November 2024** for the third-year students.



On the **University Foundation Day** on **1 December 2024**, a **Quiz & Debate Competition** was held. The event had 14 participants forming 7 teams.

## Parul University, Vadodara

**Chemical Charades: Pictionary Extravaganza** was held on **6 August 2024**. It was a dynamic and interactive event combining creativity, learning and teamwork. The event featured chemical engineering-themed challenges and an exciting Pictionary game where participants visualized and guessed technical concepts. This initiative aimed to foster engagement with chemical engineering topics, build camaraderie among the students and promote collaborative problem-solving.



### Workshops:

i. On **Material & Energy Balances with Computational Aids** on **10 – 14 and 17 September 2024** for the 3<sup>rd</sup> semester UG students. **Dr. Priya Saxena**, Associate Professor, Chemical Engineering Department, Parul Institute of Technology, Parul University was the resource person. The workshop offered hands-on training on various computational and optimization features of MICROSOFT EXCEL. It was also designed for introducing students to use MICROSOFT EXCEL in solving various problems in the area of material and energy balances.



ii. On **Advanced Industrial Fire and Safety Prevention** during **9 – 11 October 2024**. **Mr Meghanshu Joshi**, Fire and Safety Officer, Firewise Training, was the resource person. It aimed at fostering a culture of safety awareness among the undergraduate students.

A **Webinar**, titled, '**Life of a Chemical Engineer**' was held on **28 September 2024**, in which **Mr. Saurabh Mittal**, Technology Specialist, Honeywell – UOP was the resource person. Mr. Mittal focused on providing valuable insights into advanced chemical engineering topics, bridging the gap between academic learning and industry practices. His objective was to enhance students' technical skills and knowledge through interactive discussions, Q&A sessions and real-world examples, thereby motivating students to pursue excellence in their studies and future careers in the Chemical Engineering field.

**Rasaayan Sangam**, a technical event with fun-filled activities, was held on **19 September 2024**. The event included activities, such as, **Chem-o-Car/Chem-o-Rocket** with participants applying Chemical Engineering concepts to design and launch innovative models; **Poster Pioneers** in which creativity and technical knowledge were manifested through visually impactful posters; and, **Peaky Blinders**, a quiz contest. The

objective of **Rasaayan Sangam** was to promote practical learning, encourage innovation and strengthen community bonds within the department.



An **Expert Talk**, titled, ‘**Process Intensification of CO<sub>2</sub> Separation by Gas Absorption in Micro-channels,**’ was delivered on **5 October 2024** by **Dr. Rohitash Kumar**, Lead Process Engineer, Gulbrandsen Chemicals, Mujpur Vadodara. The talk focussed on the innovative concept of process intensification (PI) and its applications in CO<sub>2</sub> separation using micro-channel technology.

## SASTRA Deemed to be University, Thanjavur

**Engineer’s Day** was observed on **10 and 12 September** as well as on **19 September 2024**. During the first phase (**10 and 12 September**), the students organized four distinct events, namely, **Paatuku Paatu** (two interactive segments blending creativity, teamwork and chemical engineering); **Scavenger Hunt** (combining problem-solving skills, time management, and creativity); **Chem-E Jeopardy** (educational and interactive event) and **Debate** (on the topic ‘Chemical Engineer has to be Restricted to Regulation vs Innovation to Development of Future Science’).



During the second phase (**19 September**), Engineer’s Day was celebrated in remembrance of **Sir Mokshagundam Visvesvaraya**, the renowned Indian engineer. On the occasion, the Chief Guest for the event, **Prof. Ruben Sudhakar D**, Assistant Professor, Department of Energy and Environment, National Institute of Technology, Tiruchirapalli delivered a **Talk** on ‘**Advances in Energy and Sustainability.**’

**De-NOVO UTSAV 2024**, organized jointly by the concerned Student Chapter along with Collaborative Student Association of the School of Chemical and Biotechnology was organized on **5 and 6 October 2024**. It was designed to encourage innovation, empower ideas and build the leaders of tomorrow. Events under De-NOVO UTSAV included **Poster Presentation**, **LAB LOGIC** (Participants engaged in hands-on lab experiments) and **SUSTAIN-A-BOND** (Participants created PowerPoint presentations focused on Sustainable Development Goals).





## Nandha Engineering College (Autonomous), Erode

The following Lectures were delivered:

i. On ‘**Importance of Mycelin in Food Industries**’ by **Mr. Senthil Velavan Dorai**, Proprietor, Green Process Technology on **4 July 2024**.

On **Employment and Entrepreneurship Opportunities in Bio-based Chemicals and its Products** by **Dr. Aravindh S.** on **19 August 2024**.



i. On **Leveraging LinkedIn for Career Growth and Entrepreneurial Success** by **Mr. M. Ashwin**, Content Creator, PPTS Pvt. Ltd., Coimbatore on **8 October 2024**.

ii. On **Opportunities and Role of Chemical Engineers in Nuclear Power Plant** by **Mr. T. Ravi Sankar**, Planning Engineer, Nuclear Power Corporation of India Ltd, Kudankulam on **16 October 2024**.

An **Industrial Seminar** on the theme of ‘**Chemical Process Design**’ was organised on **30 September 2024**. **Mr. S. Stalin**, Whole Time Director on the Board of SPIC, Tuticorin was the resource person.

## Rajiv Gandhi University of Knowledge Technologies, Nuzvid



**TECKZITE'24**, the annual national-level **Techno-Management Fest**, was organized during **12 - 14 April 2024**. The theme of the fest was ‘**Metaverse**.’ The event was held in association with the Amaravati RC, IICChE. The Chief Guest, **Prof. K. Hema Chandra Reddy**, Chairman, Andhra Pradesh State Council of Higher Education, and **Prof. M. Chandrasekhar**, Director RGUKT Nuzvid inaugurated the event by lighting the ceremonial lamp. **Project Expo**, held on the second day of Teckzite'24, showcased the innovative prowess of the

students and provided a platform for them to demonstrate their creativity and logical thinking through a diverse array of prototype exhibitions. The **Expo** featured live demonstrations, interactive displays, engaging presentations and 15 prototype exhibitions, including, that of *Smart Helmet; Radar System; Voice Controller Bot* and *Coding Decoding AI & ML*.

A series of **Workshops** were also organized during the event. The workshops served as catalysts for learning, collaboration and professional growth of the participating students. The evenings were marked by cultural programmes on the first two days of the event.

## University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka



A lecture programme was organized on **15 October, 2024**, with **Mr. C.P. Srivastava**, Former MD & CEO, Jordan India Fertiliser Company LLC and Vice Chairman, Northern RC, IICChE. At the beginning, **Prof. Anil Verma**, Department of Chemical Engineering, IIT Delhi, and Chairman, Northern RC welcomed the Speaker and all the participants. Mr. Srivastava delivered the interactive lecture on ‘**Chemical Plant Design - An Overview.**’ **Dr. Siddhartha Mukherjee**, Honorary Secretary, Northern RC delivered the concluding remarks.

**Prof. Dinesh Kumar**, Associate Professor, Department of Chemical Engineering, USCT-GGSIPU, Delhi and IICChE USCT Student Chapter Coordinator delivered the Vote of Thanks at the end of the lecture.

## Amrita Vishwa Vidyapeetham, Coimbatore

**ChemE Silver Series I Seminar** was held on **8 August 2024**. The theme was ‘**Recent Progress of Water Electrolyzer Technologies for Green Hydrogen Generation.**’ **Dr. Ramakrishnan Shanmugam**, Research Associate, Newcastle University, UK, was the resource person who discussed **green hydrogen production, electrolyzer challenges and sustainable technologies**. His lecture was followed by an interactive session.

**Agilent Technologies** conducted an educational session titled, ‘**Advancements and Applications of ICP-OES Technology**’ on **12 September 2024**. The objective was to explain the features of their newly installed ICP-OES technology at the Centre of Excellence in Advanced Materials and Green Technologies (CoE-AMGT) in the college. The Agilent personnel explained the students and the faculties about various features of the technology, provided information about equipment produced by their company and concluded with a hands-on training/live demonstration of the newly installed equipment.

The 12th edition of **Anokha 2024**, the national **Techfest** of Amrita Vishwa Vidyapeetham, was held during **17 - 19 October 2024**. The Department of Chemical Engineering & Material Science along with IICChE Student Chapter at the college hosted the following events as part of the event, namely, **Technical Dungeon, Path Quest, Workshop and Tech-Fair**.





In **Technical Dungeon**, 21 participating teams faced ultimate tests of knowledge, strategy and teamwork through dynamic games. The **Workshop on 'Chemical Engineering in Semiconductors'** covered a wide range of topics, including, semiconductor device fabrication, materials science and process engineering. **Ms. Sornavalli Ramanathan** from Intel Technologies shared valuable insights into the critical role of Chemical Engineers in modern semiconductor manufacturing. **Path Quest** was a keenly contested competition that challenged 15 participating teams to showcase their problem-solving skills, creativity and teamwork. The final event under Anokha 2024, i.e., **Tech-Fair** showcased over 50 projects, based on the concept of the UN Sustainable Development Goals (SDGs). Notable projects included Lemongrass distillation column, Microchannel based cogeneration unit for efficient utilization of solar energy, Oxygen concentrator, etc.

During Anokha 2024, the Publicity Committee of Amrita Vishwa Vidyapeetham also undertook a campaign to encourage the participants to connect to IICHe and follow Amrita's IICHe social media pages.

On **10 December 2024**, The IICHe Student Chapter hosted its **Induction and Felicitation Ceremony**, celebrating the achievements of the outgoing co-heads, welcoming new leaders and acknowledging the invaluable contributions of the faculty members and retiring heads. The programme highlighted the Student Chapter's ongoing journey of collaboration and innovation, setting the stage for a vibrant future.

### Rajiv Gandhi Institute of Petroleum Technology, Jais

RGIPT organised the 3rd '**Urja Shakti 2025**', a national level **write-up competition** for female Undergraduate Engineering and Postgraduate Engineering students. The winners were awarded. Moreover, for the UG category winners, there was a provision for winning an internship for a subject of their choice. The competition was held via the on-line mode from **1 February to 3 March 2025**. The themes for competition were: **AI, ML, IoT Application in Petroleum industry/ Cyber Security in Energy Sector /Automation in Energy Sector, Unconventional / Renewable Energy Sources, Waste to Energy/Zero Waste Energy, Energy Storage & Utilization/ Grid Modernization, Energy Policies & Climate Changes and Emerging Energy Technologies/ Strategies for CO<sub>2</sub> Capture and Utilization/ Hydrogen Energy/ Nuclear Energy.**

### Government Engineering College, Bharuch

A Talk was organized on **28 June 2024** on '**Recent Trends in the Field of Chemical Engineering**' By **Dr. Samidha Banka**.



An **Industry Visit to Dudhdhara Dairy**, Bharuch was organised on **4 September 2024**, in which 41 students from various semesters participated along with two faculty members. Students were shown around various units and told about the unit operations for milk processing. They also learnt about functioning of various equipment, such as, spray dryer, centrifugal

separators and packaging sections. They also learnt about working of Reverse Osmosis plant, cleaning and processing of equipment.

To develop an understanding of responsibilities of the society to promote environment friendliness and sustainability, a few members of the IICChE Students Chapter, Semester 3, GEC Bharuch took an initiative and made **environment-friendly Ganeshaji Idol from green coconut**.

A **Best out of waste article preparation competition** was held on **3 October 2024** to celebrate Swachhta Diwas. Students prepared various articles like doll from waste sponge material, metal pins collector from waste card board, flower pot from used tires, showpiece from waste funnel and articles from waste paper.

An **Elocution Competition on ‘Scope for Girls in Chemical Engineering’** was organized on **9 October 2024** at the Department of Chemical Engineering, GEC.

Among the participants, namely, Disha lalwani, Twinkal Gupta, Heer Rana, Jeneesha Parmar, Kavya Kharde, Krishna, Mamta Padhiyar, Mansi patel, Vaishnav Mittal and Kharva Vaishnavi, **Jeneesha Parmar** was adjudged to be the winner.



## Energy Conclave

A conclave on the theme, ‘**Accelerating Eastern India’s Low Carbon Transformation through Energy Efficiency**’, was organized by **Confederation of Indian Industry (CII)** on **20 November 2024** in Kolkata. The event was inaugurated by **Janab Md. Ghulam Rabbani**, Hon’ble Minister in-charge, Department of Non-conventional and Renewable Energy Sources (NRES), Government of West Bengal, who was also the Chief Guest. The welcome address was delivered by **Mr. Sandip Kumar**, Chairman, CII West Bengal State Council and Managing Director, Tata Steel Downstream Products Limited (TSDPL). **Mr. Barun Kumar Ray**, IAS, Additional Chief Secretary, NRES, Government of West Bengal also addressed the esteemed guests, enlightening about various policies and initiatives, undertaken by the Government of West Bengal towards , undertaken by the Government of West Bengal towards de-carbonization as per the Paris Agreement for the Period 2021- 2030.

**Mr. Ivan Saha**, Chairman, CII Energy Subcommittee and CEO, Vikram Solar Limited explained the theme of the conference and the Indian perspective towards low carbon transformation through energy transition. **Dr. John Mathai**, Member Secretary, Damodar Valley Corporation, highlighted DVC’s impactful CSR initiatives across its 24,000 sq. km command area, focusing on solar lighting projects and educational advancements with the objective of ushering in meaningful changes in the society.

The conclave consisted of four panel discussions, each addressing separate topics under the general theme of renewable energy and de-carbonisation. The first one was held on the theme of ‘**Enhancing Power Sector Resilience: Sustainable Solution for Conventional Energy Challenges**’. **Dr. S. P. Gon Chaudhuri**, Honorary Faculty, IEST Shibpur was the moderator of the second panel, which focused on the theme, ‘**Accelerating Energy Transition in Eastern India**’. The third panel discussion was moderated by **Mr. Ivan Saha** on the theme of ‘**Harnessing Futuristic Technologies for Sustainable Growth**’. The last session highlighted ‘**Case Study Insights: Paving the Way for an Energy Efficient Future through Energy Conservation and Low Carbon Initiatives**’.

The conclave concluded with a prize distribution ceremony, followed by offering of the Vote of Thanks. The event showcased a great opportunity for interaction with experts and authorities in the field of Renewable Energy while updating oneself with the aspect of de-carbonization from India’s perspective.

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