ENGROSSER' 26

Title: Sustainable Water Treatment – Integration of Chemical and AI Technologies

Sustainable water treatment has become a global priority due to increasing water scarcity, rapid industrialization, population growth, and climate change. Conventional water and wastewater treatment processes such as coagulation, adsorption, membrane filtration, biological treatment, and advanced oxidation are based on strong chemical engineering principles. While these methods are effective, they often face challenges such as high energy consumption, excessive chemical usage, operational inefficiencies, and limited adaptability to changing water quality conditions.

The integration of Artificial Intelligence (AI) with chemical treatment technologies offers an innovative and sustainable solution. AI provides advanced capabilities such as real-time data analysis, pattern recognition, predictive modeling, and intelligent automation. By processing large volumes of operational and environmental data, AI can optimize chemical dosing, enhance contaminant removal efficiency, predict system failures, and improve overall plant performance.

This multidisciplinary approach combines Chemical Engineering, Environmental Engineering, Computer Science, and Data Analytics to develop smart, energy-efficient, and cost-effective water treatment systems. As AI technologies continue to evolve, their integration with chemical processes will play a crucial role in ensuring sustainable water management and achieving long-term environmental protection goals.

Below are some key roles that AI plays in Sustainable Water Treatment:

- Real-time Water Quality Monitoring and Data Analytics
- Optimization of Chemical Dosing and Treatment Efficiency
- Predictive Maintenance of Treatment Plants
- Resource Recovery and Circular Water Management

We are pleased to announce the upcoming annual technical paper writing competition on **"Sustainable Water Treatment – Integration of Chemical and AI Technologies"** under the banner of the Students' Chapter of the Indian Institute of Chemical Engineers (IIChE).

The objective of this competition is to highlight emerging research, innovation, and interdisciplinary solutions that promote sustainable water treatment and smart environmental management systems.

INSTITUTE OF ENGINEERING & SCIENCE
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Topics to be covered:

1. AI-Based Optimization of Chemical Water Treatment Processes
2. Smart Sensors, IoT, and Real-Time Water Quality Monitoring Systems
3. Energy-Efficient and Sustainable Wastewater Treatment Systems
4. Water Reuse, Resource Recovery, and Circular Economy Approaches
5. Environmental and Societal Impact of AI-Integrated Water Treatment Technologies

Instructions for Paper Writing:

Team of maximum four members can participate in competition, paper should be typed in Times New Roman (Font size 12) 1.5 line spacing on A4 size paper leaving 1" margin from all sides. The title should be in bold followed by authors' name and affiliation as center alignment along with the Email id. Maximum pages allowed are ten including figures, tables and references.

Registration:

The participants have to send hard & soft copy of their full length paper along with registration form.

Email id for correspondence- iiche.engrosser@gmail.com, jitendrapatidar@ipsacademy.org

Prizes & Certificates:

Three best papers of participating students will be awarded with the 1st, 2nd& 3rd Prize and remaining all students will get certificate of participation.

Important Dates:

1. Last date for submission of paper : 28-03-2026
2. Declaration of results : 04-04-2026

Convener

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Under the Banner of Students' Chapter IIChE

REGISTRATION FORM

Author's Full Name:

1…….

2…….

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Branch and year:.....

Address: .....

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Phone/Mobile No: .....

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Institute Name: .....

Title of the Paper: .....

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Certified that above information is true to the best of my knowledge

Signature of Participants

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