GHARDA INSTITUTE OF TECHNOLOGY

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DEPARTMENTAL NEWSLETTER - CHEMICAL ENGINEERING

VOLUME-3, Issue-02

(Jan - April 2024)

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Volume 3: Issue 02 (Jan to April 2024)

DEPARTMENTAL NEWSLETTER - CHEMICAL ENGINEERING

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Academic Year 2023**-2**4

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Editorial Team

Student Editor: Mr. Prashant Chaudhary

Faculty Editor: Prof. Nitish D. Galande

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Vision of the Chemical Engineering Department:

"Produce employable graduates through a multidisciplinary approach, equipping them with chemical engineering knowledge and research skills, for the welfare of society."

Mission of the Department

M1: Impart knowledge and understanding of the diverse fields of chemical engineering profession through curriculum.
M2: Develop chemical engineering professional and research skills to become technically competent professionals.
M3: Inculcate the importance of social and life-long learning.

Program Educational Objectives (PEOs)

PEO1: Graduates of the program will apply chemical engineering principles in engineering practice.
PEO2: Graduates of the program will have technical or professional careers in chemical engineering or in the diverse fields of chemical engineering such as biochemical engineering, energy and environmental engineering etc.
PEO3: Pursue higher study and / or continuously upgrade the knowledge with Personal and professional growth for collective advancement of society.

Programme specific outcomes (PSOs)

POS1: Create Chemical Engineering solutions for problems and processes while taking into account separation operations, reaction kinetics, environmental issues, and waste treatment and, modelling and simulation.

PSO 2: Foster the industrial chemical production process through efficient design and modifications by applying the principles of Chemical Engineering.

PSO 3: Demonstrate responsible professional behaviour by integrating ethical considerations, promoting safety, communicating effectively, and engaging in lifelong learning for societal and Environmental well-being.

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Program Outcomes (POs) as per NBA

Program Outcomes (POs) are as follows:

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, and engineering fundamentals to solve complex chemical engineering problems.
2. **Problem Analysis:** Identify, formulate, and analyze complex engineering problems to reach substantiated conclusions using principles of mathematics, natural sciences, and engineering sciences.
3. **Design/Development of Solutions:** Design solutions for complex engineering problems that meet specified needs with appropriate consideration for public health, safety, and environmental concerns**.**
4. **Investigation of Complex Problems:** Conduct research-based investigations, including designing experiments, analyzing data, and synthesizing information to provide valid conclusions.
5. **Modern Tool Usage:** Select, apply, and adapt appropriate techniques, resources, and modern engineering tools, including prediction and modeling, to solve complex engineering activities.
6. **The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal, and cultural issues relevant to professional engineering practice.
7. **Environment and Sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics, responsibilities, and norms of the engineering practice.
9. **Individual and Team Work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and society at large through reports, presentations, and documentation.
11. **Project Management and Finance:** Demonstrate knowledge of engineering and management principles to manage projects in multidisciplinary environments.
12. **Life-long Learning:** Recognize the need for, and engage in, independent and lifelong learning in the broadest context of technological change.

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Message from the Principal

Dear Readers,

I am delighted to present Volume 3, Issue 2 of the Departmental Newsletter for January–April 2024. This edition reflects the department's unwavering commitment to academic excellence, research, and industry collaborations. The remarkable achievements of our faculty and students in publications, innovative projects, and professional growth highlight the vibrant learning culture within the department.

The continuous efforts in fostering industry-academia partnerships, sustainability initiatives, and student-driven learning are commendable. The MOUs, guest lectures, workshops, and outreach programs featured in this issue demonstrate the holistic development of our students and their preparedness for future challenges.

I sincerely appreciate the faculty, students, and editorial team for their dedication in curating this newsletter. May this platform continue to inspire knowledge-sharing, innovation, and professional excellence. Let us all strive together for greater milestones in the future.

Dr. Pramod Patil
Principal

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Message from the Head of the Department

Dear Readers,

It gives me great pleasure to present **Volume 3, Issue 2** of our Departmental Newsletter for **January–April 2024**. This edition highlights the outstanding contributions of our **faculty and students in research, industry collaborations, and academic excellence**. Our department continues to foster an environment of **innovation, sustainability, and professional growth**, ensuring that our students are well-equipped for future challenges.

The various **guest lectures, MOUs, workshops, and student achievements** showcased in this issue reflect our commitment to holistic education. I am proud of the dedication displayed by our faculty and students in driving impactful research and fostering strong industry-academia partnerships.

I extend my gratitude to the editorial team, faculty members, and students for their efforts in making this newsletter a success. Let us continue to strive for excellence and contribute to the ever-evolving landscape of Chemical Engineering.

Dr. Shyam P. Tekade
Head of the Department

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Message from the Faculty Editor

Dear Readers,

It is with great enthusiasm that I present Volume 3, Issue 2 of our Departmental Newsletter for January–April 2024. This edition encapsulates the remarkable achievements, research contributions, industry collaborations, and academic milestones of our faculty and students. Each article and feature reflects the continuous efforts of our department in fostering innovation, excellence, and holistic learning.

I would like to extend my sincere appreciation to all faculty members, students, and contributors who have worked diligently to bring this newsletter to life. Special thanks to the editorial team for their dedication and hard work in compiling this issue.

I hope this newsletter serves as an inspiration for all, encouraging knowledge-sharing, professional growth, and continuous learning. Let's continue striving for excellence and making meaningful contributions to the field of Chemical Engineering.

Prof. Nitish D. Galande

Faculty Editor

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Message from Student Editorial Coordinator

Dear Readers,

It is a great privilege to be part of the editorial team for **Volume 3, Issue 2** of our Departmental Newsletter for **January–April 2024**. This edition showcases the **academic achievements, research contributions, and industry collaborations** of our department, highlighting the dedication and passion of both faculty and students.

Compiling this newsletter has been a rewarding journey, and I extend my heartfelt gratitude to all contributors for their efforts in making this issue insightful and engaging. A special thanks to my fellow students and faculty members for their constant support and encouragement.

I hope this newsletter serves as a platform for inspiration and motivation, encouraging everyone to pursue excellence in **education, research, and professional development**. Let's continue striving for success together!

Mr. Prashant Chaudhary
Student Editorial Coordinator

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ACADEMIC YEAR 2023-24

(Semester: Second -2023-24)

Yearly Publication Record

The Chemical Engineering Department has achieved significant progress in research and publications during the first half of the academic year. Faculty members have published numerous research papers in Scopus/UGC-approved journals, bolstering the department's academic reputation.

Faculty Research Publication Update

1. **Author:** Dr. Sudesh D. Ayare & Co-authors
   Title: *"A Review on Current Scenario of Energy, Nuclear Reactor Technology, and Cold Trap"*
   Journal: *Clean Technologies and Environmental Policy (2023)*
   Indexing: SCI & Scopus

   Dr. **Sudesh D. Ayare** and his co-authors have published a **significant research paper** titled *"A Review on Current Scenario of Energy, Nuclear Reactor Technology, and Cold Trap"* in the prestigious journal *Clean Technologies and Environmental Policy (2023)*. The paper, indexed in **SCI and Scopus**, underscores its **high impact and relevance** in the field of energy and nuclear technology. This publication contributes to advancements in **sustainable energy solutions, nuclear reactor efficiency, and cold trap mechanisms**, offering insights into **current challenges and future developments**. The recognition of this work reflects the **academic excellence and research capabilities** of the institute.

   Congratulations to **Dr. Sudesh D. Ayare** and the research team for their achievement!!!!!!

2. **Author:** Dr. Sandip H. Gharat

   Title: *"Augmented Flow and Reduced Clogging of Particles Passing Through Small Apertures by Addition of Fine Grains"*

   Journal: *Powder Technology (2023)*

   Indexing: SCI & Scopus

   Dr. **Sandip H. Gharat** has published an impactful research paper in *Powder Technology (2023)*, titled *"Augmented Flow and Reduced Clogging of Particles Passing Through Small Apertures by Addition of Fine Grains."* This study, indexed in **SCI and Scopus**, presents **innovative approaches to improving particle flow and minimizing clogging issues**, which are critical in industries such as **chemical processing, pharmaceuticals, and material handling**.The research provides valuable insights into **particle interactions, granular flow optimization, and industrial applications**, further strengthening the **scientific contributions** of the institute.

   Congratulations to **Dr. Sandip H. Gharat** for this remarkable achievement!

3. **Author:** Dr. S.J. Kulkarni & Team

   Title: *"Biohydrogen from Waste Feedstocks: Materials, Methods, and Recent Developments"*

   Journal: *BioNano Science (2023)*

   Indexing: ESCI & Scopus

   Dr. **S.J. Kulkarni** and his research team have published an insightful paper titled *"Biohydrogen from Waste Feedstocks: Materials, Methods, and Recent Developments"* in *BioNano Science (2023)*. Indexed in **ESCI and Scopus**, this study explores **cutting-edge advancements in biohydrogen production**, emphasizing the **use of waste feedstocks for sustainable energy generation**.The research highlights **efficient materials, innovative methodologies, and emerging trends in hydrogen production**, contributing to the growing field of **renewable energy and environmental sustainability**. This publication reinforces the institute's commitment to impactful research in **green energy solutions**.

Congratulations to **Dr. S.J. Kulkarni and his team** for their outstanding contribution to sustainable science!!!!

Faculty as Resource Person/Guest Lecture

The department organized guest lectures and workshops to enhance students' knowledge and exposure to industry trends.

1. Faculty as Resource Person – Guest Lecture by Dr. S.P. Tekade

Topic: *"Recent Trends and Opportunities in Chemical Engineering"*
Date: 17th January 2024
Speaker: Dr. S.P. Tekade
Audience: Diploma Students
Organized by: Chemical Engineering Department, GIT Lavel

Dr. **S.P. Tekade** conducted an insightful **workshop** on *"Recent Trends and Opportunities in Chemical Engineering"* on **17th January 2024**. This session aimed to **bridge the gap between academic knowledge and industry practices**, offering Diploma students a **comprehensive understanding of modern advancements in the field**.

During the workshop, Dr. Tekade discussed **emerging technologies, career prospects, and industrial innovations** in Chemical Engineering. The session highlighted **sustainability, process optimization, and future research directions**, equipping students with valuable industry insights.

The interactive workshop provided an **excellent learning platform** for aspiring engineers, encouraging them to explore **diverse career opportunities** in the field.

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Memorandum of Understanding (MOU) –

Industry Collaboration

The department actively collaborated with industries and academic institutions through MOUs.

1. The **Chemical Engineering Department** actively engages in **industry-academia collaborations** to enhance student learning and professional development.

   An **MOU** was signed with **Rashtriya Fertilizers and Chemicals Ltd.** on **13th February 2024**. This partnership focuses on **internships and training programs**, providing students with **practical exposure to real-world industrial processes**. By working closely with industry professionals, students will gain **hands-on experience, skill development, and insights into the latest technological advancements**, ultimately improving their **employability and career prospects**.

   Such collaborations reinforce the department's commitment to **bridging the gap between academia and industry**, fostering **practical learning and professional growth** for future chemical engineers.

2. The **Chemical Engineering Department** remains committed to fostering **strong industry-academia partnerships** to enhance student learning and skill development.

   In addition to the recent collaboration with **Rashtriya Fertilizers and Chemicals Ltd.**, the department continues its **ongoing MOU** with **Montage Chemicals Pvt. Ltd.,** signed on **1st February 2024**. This long-standing partnership provides students with **internship opportunities and major project guidance**, enabling them to gain **practical industrial experience and exposure to real-world challenges**.

   Such collaborations play a crucial role in **bridging the gap between theoretical knowledge and industrial applications**, ensuring that students are well-prepared for **future career opportunities** in the field of **Chemical Engineering**.

Faculty Recognition – Dr. S.D. Ayare Appointed as Avishkar Guide

The **Chemical Engineering Department** is proud to acknowledge the achievements of its faculty members in **academia and research mentorship**.

Dr. **S.D. Ayare** has been appointed as an **Avishkar Guide** for **state-level research conventions** by the **University of Mumbai**. In this prestigious role, he mentors **undergraduate students**, guiding them in **research methodologies, innovation, and scientific exploration**.

His **expert mentorship** has played a vital role in **enhancing students' research capabilities**, fostering **critical thinking and problem-solving skills**, and preparing them for **higher studies and research careers**. This recognition reflects the **department's commitment to academic excellence and research-driven learning**.

Research & Publications – Faculty Achievements

The **Chemical Engineering Department** continues to excel in **research and innovation**, with faculty members contributing to **high-impact journals and scholarly books**.

Research & Publications – Faculty Achievements

1) Dr. **S.H. Gharat** co-authored a research paper titled **"Cavitation-assisted Intensification of Biogas Production"**, published in **Environmental Quality Management (2023)**, an **SCI-indexed journal**. This study explores **sustainable energy solutions** by utilizing **hydrodynamic cavitation** to enhance **biogas production efficiency**.

   The research presents an innovative approach to **renewable energy generation**, contributing to advancements in **waste-to-energy technologies and sustainable industrial practices**.

   Congratulations to **Dr. S.H. Gharat** for his **valuable contribution** to the field of **Chemical Engineering and sustainable energy research**.

2) Dr. **S.P. Tekade** published a research paper titled **"Ultrasound-Combined Oxidants for Tartrazine Dye Degradation"** in **Environmental Monitoring and Assessment (2023)**, an **SCI-indexed journal by Springer**. This study explores **advanced wastewater treatment methods**, focusing on the **efficient degradation of Tartrazine dye using ultrasound-assisted oxidation techniques**.

   His research contributes to the development of **sustainable and effective water treatment technologies**, addressing **industrial pollution and environmental conservation challenges**.

   Congratulations to **Dr. S.P. Tekade** for his **notable research contributions** in the field of **Chemical Engineering and environmental protection**.

3) Dr. **S.D. Ayare** contributed to the research paper titled **"Hydrodynamic Cavitation for Industrial Wastewater Treatment"**, published in **Environmental Technology (2023)**, an **ESCI and Scopus-indexed journal**. This study highlights **sustainable remediation techniques**, emphasizing the role of **hydrodynamic cavitation** in enhancing **industrial wastewater treatment efficiency**.

   His research provides valuable insights into **eco-friendly and cost-effective wastewater management**, addressing key challenges in **environmental sustainability and industrial pollution control**.

   The department congratulates **Dr. S.D. Ayare** for his **significant contribution** to advancing **sustainable water treatment technologies**.

Research & Publications – Books & Proceedings

1) The **Chemical Engineering Department** continues to make significant contributions to **academic literature and advanced research**.

Dr. **S.J. Kulkarni** authored a book chapter titled **"Multifaceted Applications of Nanocomposites"** in *Smart and Sustainable Applications of Nanocomposites* (**IGI Global, 2024**). This chapter explores the **versatile applications of nanocomposites**, highlighting their **role in chemical engineering, materials science, and sustainable technologies**.

His work emphasizes the **importance of nanotechnology in developing innovative and environmentally friendly engineering solutions**, contributing to **advancements in industrial and research applications**.

Congratulations to **Dr. S.J. Kulkarni** for his **valuable scholarly contribution** to the field of **nanotechnology and chemical engineering**.

2) Dr. S.J. Kulkarni authored a chapter, and Dr. Tejas Chalke co-authored the chapter "Application of CFD in Healthcare" in *Biomedical Research Developments* (IGI Global, 2024). This work highlights the integration of Computational Fluid Dynamics (CFD) in medical sciences, showcasing its role in biomedical research, medical device optimization, and healthcare advancements.

Their research bridges engineering and medical sciences, emphasizing the impact of CFD on improving drug delivery systems, patient care technologies, and clinical diagnostics.

Congratulations to Dr. S.J. Kulkarni and Dr. Tejas Chalke for their valuable contribution to interdisciplinary research!

Faculty Achievements & Recognition

1. The **Chemical Engineering Department** proudly acknowledges the achievements of its faculty in **academic and research excellence**.
   Dr. **S.P. Tekade** has been recognized as a **Reviewer** for Elsevier's esteemed **International Journal of Hydrogen Energy** in **February 2024**. This recognition underscores his **expertise in hydrogen energy research** and provides him with

access to cutting-edge global research in the field of **sustainable and renewable energy technologies**.

His role as a **peer reviewer** enhances the department's reputation in **scientific research** and contributes to the **advancement of clean energy solutions**.

Congratulations to **Dr. S.P. Tekade** on this **prestigious achievement**!

2. The Chemical Engineering Department proudly recognizes the accomplishments of its esteemed faculty members in mentorship and research excellence.

   Dr. S.D. Ayare was appointed as a **Mentor for Maharashtra's Inter-University Research Convention in January 2024**. In this role, he is guiding undergraduate students in **innovative research projects, fostering critical thinking and scientific inquiry.**

   His mentorship plays a vital role in shaping young researchers, encouraging cutting-edge innovations, and strengthening academic-industry collaborations.

   Congratulations to **Dr. S.D. Ayare** on this prestigious recognition!

NSS Camp on Rural Sustainability at Jamburde Village (March 2024)

The **National Service Scheme (NSS) Camp** was successfully conducted at **Jamburde Village** under the leadership of **Prof. S.M. Jangam** in **March 2024**. This **four-day camp** focused on **rural sustainability**, engaging students in various activities aimed at **environmental conservation, community service, and sustainable development**.

Participants actively contributed to initiatives such as:

✓ **Tree plantation drives**

✓ **Water conservation awareness programs**

✓ **Sanitation and hygiene improvement efforts**

✓ **Educational sessions for villagers**

The camp provided students with **hands-on experience in social responsibility and sustainable rural development**, fostering a strong **spirit of community service**.

This initiative strengthened the institute's commitment to **social outreach**, equipping students with **practical knowledge on sustainability**. The camp concluded with a **vote of thanks**, leaving a **meaningful impact** on both students and the local community.

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- **Student Coordinators:** Mr. Prashant Chaudhary

Department of Chemical Engineering
Academic Year 2024-25.