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SPARK



QUARTERLY MAGAZINE OF THE
DEPARTMENT OF
CHEMICAL ENGINEERING

SRI SIVASUBRAMANIYA NADAR
COLLEGE OF ENGINEERING

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From HOD's Desk

The Department of Chemical Engineering has played a number of roles in educational and scientific endeavours ever since it was founded. Most of the aforementioned activities, including placements, have shown a steady improvement. Publishing the quarterly newsletter SPARK is one such endeavour.

The department is pleased to provide the newsletter Edition 39, which contains all information and accomplishments of our faculty and students. Publication of manuscripts in journals with high impact factor and the potential for partnership with Srinivas Solid Waste Management Company, Chennai, are two noteworthy accomplishments in this edition. In addition, I offer my congratulations to our students for being hired by numerous super dream and dream category companies.

I personally appreciate the editorial team members and newsletter faculty organisers who worked tirelessly to bring our publication to life.

Dr. K. Sathish Kumar

Prof & Head

Department of Chemical Engineering

FACULTY ACTIVITIES

Awards & Recognition

- ✦ **Dr. R Parthiban Prof/Chem** has been nominated as the Chairman - Board of Studies of Indian Institute of Plant Engineers for the period 2022-24 as per the decision of the 48 AGM of IIPE
- ✦ **Dr. R Parthiban Prof/Chem** has acted as a Session Chair in the International Conference in Sustainability through Digitalization, Artificial Intelligence and Green Chemistry" held during 27-30 Dec 2022 in CHEMCON 2022 organized by Indian Institute of Chemical Engineers at Harcourt Butler Technical University Kanpur
- ✦ **Dr R Parthiban Prof/Chem** attended the DC meeting for Ms V Anusha Rani for suggesting the panel of experts for oral examination under the guidance of Dr D Prabhakaran, Prof of Chemical Engineering, Coimbatore Institute of Technology on 05.01.23
- ✦ **Dr R Parthiban Prof/Chem** attended the DC meeting for Mr V Guna for suggesting the panel of experts for oral examination under the guidance of Dr D Prabhakaran, Prof of Chemical Engineering, Coimbatore Institute of Technology on 06.01.23
- ✦ **Dr. P. Senthil Kumar, Prof/Chemical Engineering** has been nominated as an Editorial Board Member in the prestigious journal, Biofuels, (IF: 2.731), Taylor & Francis
- ✦ **Dr. P. Senthil Kumar, Prof/Chemical Engineering** has been nominated as a Scientific Committee Member in the 3rd Energy Security and Chemical Engineering Congress (ESChE 2023) on 09-01-2023.
- ✦ **Dr. P. Senthil Kumar, Prof/Chemical Engineering** has been nominated as an Associate Editor in the prestigious journal, Carbon Letters, (IF: 3.117), Springer on 07-01-2023.
- ✦ **Dr. D. Balaji** attended DC Meeting(online) - Mrs. Deepika J, PSG College of Technology, Coimbatore on January 4, 2023.
- ✦ **Dr. P. Senthil Kumar Prof/Chem** Engineering received the Top Cited Article 2021-2022 Award from Wiley Publisher for his published article "Surfactant-aided mycoremediation of soil contaminated with polycyclic aromatic hydrocarbon (PAHs): progress, limitation, and counter measures" on 21-02-2023.

- ✪ **Dr. P. Senthil Kumar, Prof/Chem** Engineering received the appreciation certificate from Hindawi Publisher for being an Academic Editor in the prestigious Journal "Adsorption Science & Technology" (IF: 4.373) on 04-02-2023.
- ✪ **Dr. P. Senthil Kumar, Prof/Chem** Engineering received the appreciation certificate from Hindawi Publisher for being an Academic Editor in the prestigious Journal "International Journal of Chemical Engineering" (IF: 2.729) on 04-02-2023.
- ✪ **Dr. R Parthiban, Prof/Chem** was the jury for the Confederation of Indian Industry - CII Young Manufacturing Managers Competition in Chennai on 25 Feb 2023
- ✪ **Dr. P. Senthil Kumar, Prof/Chem** received the award as "Top Downloaded Article" from Wiley Publisher for his published article "Recent advances in biotransformation of 5-Hydroxymethylfurfural: challenges and future aspects" in a journal "JOURNAL OF CHEMICAL TECHNOLOGY AND BIOTECHNOLOGY" on 30-03-2023.

Journal & Book Chapter Publications

- 📖 New analytical strategies amplified with carbon-based nanomaterial for sensing food pollutants, Mary Isabella Sonali J, Subhashree S, **P. Senthil Kumar**, Veena Gayathri K, Chemosphere, Vol. 295, pp. 133847, 2022, Clarivate, 8.943
- 📖 Facile preparation and characterization of MXene@Platinum nanocomposite for energy conversion applications, V. Thirumal, R. Yuvakkumar, **P. Senthil Kumar**, G. Ravi, Dhayalan Velauthapillai, Fuel, Vol. 317, pp. 123493, 2022, Clarivate, 8.035
- 📖 Investigation on future perspectives of ex-situ biogenic methane generation from solid wastes coal and coal washery rejects, Vinitha Ponnudurai, **Senthil Kumar P.**, Kirupa Sankar Muthuvelu, Sivasubramanian Velmurugan, Subhani Seyed Lal M, Loganathan Arumugam, Ravikumar Rajarathinam, Fuel, Vol. 318, pp. 123497, 2022, Clarivate, 8.035
- 📖 Applicability of bio-synthesized nanoparticles in fungal secondary metabolites products and plant extracts for eliminating antibiotic-resistant bacteria risks in non-clinical environments, Nur Hazirah Kamaruzaman, Nur Nabilah Mohd Noor. Radin Maya Saphira Radin Mohamed, Adel Al-Gheethi, **Senthil Kumar P.**, Ajit Sharma, Dai-Viet N. Vo, Environmental Research, Vol. 209, pp. 112831, 2022, Clarivate, 8.431
- 📖 Facile hydrothermal synthesis of MXene@antimony nanoneedle composites for toxic pollutants removal, V. Thirumal, R. Yuvakkumar, **P. Senthil Kumar**, SP. Keerthana, G.

- Ravi, M. Thambidurai, Cuong Dang, Dhayalan Velauthapillai, *Environmental Research*, Vol. 210, pp. 112904, 2022, Clarivate, 8.431
- 📖 A review on removal strategies of microorganisms from water environment using nanomaterials and their behavioural characteristics, A. Chithra, Rajaseetharama Sekar, **P. Senthil Kumar**, G. Padmalaya, *Chemosphere*, Vol. 295, pp. 133915, 2022, Clarivate, 8.943
- 📖 Process Amelioration for Production of Biohydrogen using mutated *Rhodobacter M 19* and *Enterobacter aerogenes* co-culture: Influence of Nanoparticles, J.B. Veeramalini, **P. Senthil Kumar**, I. Abernaebenezer Selvakumari, P. Sreejith, *Fuel*, Vol. 317, pp. 123558, 2022, Clarivate, 8.035
- 📖 Investigation of molecular interaction, performance of green solvent in esterification of ethanol and acetic acid at 298.15 K and at 1 atm, **Anantharaj Ramalingam**, Tamal Banerjee, Vivek Mariappan Santhi, Dharendra Kumar Mishra, Danish John Paul Mark Reji, Shruthi Nagaraj, *Asia-Pacific Journal of Chemical Engineering*, <https://doi.org/10.1002/apj.2875>, 2023, Web of Science, 1.76
- 📖 Metal mixed biochar electrodes for the generation of electricity with high power density in microbial fuel cell, M. Ramya, Kilaru Harsha Vardhan, **P. Senthil Kumar**, *Sustainable Energy Technologies and Assessments*, 53 & 102549, 2022, Web of Science, 7.632
- 📖 Biocatalytic polymeric membranes to decrease biofilm fouling and remove of organic contaminants in wastewater. A review, Jenet George, Srinidhi Sonai Anand, **P. Senthil Kumar**, Priyanka Saravanan, Rashmi Lenin, Devi Sri Rajendran, Swethaa Venkataraman, Vaidyanathan Vinoth Kumar, Dai-Viet Nguyen Vo, *Environmental Chemistry Letters*, Vol. 20, pp. 1897-1927, 2022, Clarivate, 13.615
- 📖 One-step fabrication of amino-functionalized Fe₃O₄@SiO₂ core-shell magnetic nanoparticles as a potential novel platform for selective removal of cadmium (II) from aqueous solution, Prabu Deivasigamani, **P. Senthil Kumar**, Sravya Indraganti, Sathish Sundararaman, Aravind Kumar Jagadeesan, K. Vijai Anand, *Sustainability*, Vol. 14(4), Article ID: 2290, pp 1-21, 2022, Clarivate, 3.889
- 📖 Surfactant induced copper vanadate (β -Cu₂V₂O₇, Cu₃V₂O₈) for different textile dyes degradation, S.P. Keerthana, R. Yuvakkumar, **P. Senthil Kumar**, G. Ravi, Dhayalan Velauthapillai, *Environmental Research*, Vol. 211, pp. 112964, 2022, Clarivate, 8.431

- 📖 Potential Pre-treatment of Lignocellulosic biomass for the enhancement of Biomethane Production through Anaerobic Digestion- A Review, Jason Thamizhakaran Stanley, Amudha Thanarasu, **P. Senthil Kumar**, Karthik Periyasamy, Subramanian Raghunandhakumar, Premkumar Periyaraman, Kubendran Devaraj, Anuradha Dhanasekaran, Sivanesan Subramanian, *Fuel*, Vol. 318, pp. 123593, 2022, Clarivate, 8.035
- 📖 Bench scale Production of Methanol from Crude Glycerol (1,2,3-Propanetriol) Using Zirconium loaded fluorine doped Tin Oxide, Yuvarani Mani, Rajkumar Ramakrishnan, **P. Senthil Kumar**, Thiruselvi Devaraj, Deva Rajendran, Arunbalaji Venkatalakshmi Narasimman, Roobak Parthiban Srinivasan, Subramanian Sivanesan, *Fuel*, Vol. 318, pp. 123650, 2022, Clarivate, 8.035
- 📖 Advancements on sustainable microbial fuel cells and their future prospects: A review, A.K. Priya, C. Subha, **P. Senthil Kumar**, R. Suresh, Saravanan Rajendran, Yasser Vasseghian, Matias Soto-Moscoso, *Environmental Research*, Vol. 210, pp. 112930, 2022, Clarivate, 8.431
- 📖 Mapping and Scientometric Measures on Research Publications of Energy Storage and Conversion, Baskaran Chinnasamy, R. Yuvakkumar, **P. Senthil Kumar**, G. Ravi, Dhayalan Velauthapillai, Ceren Karaman, Mehmet Lütfi Yola, Hassan Karimi - Maleh, *Topics in Catalysis* ,Vol. 65, pp. 753-764, 2022, Clarivate, 2.781
- 📖 Functionalization of MXene-based nanomaterials for the treatment of micropollutants in aquatic system: A Review, Karthik Velusamy, Padmanaban Velayudhaperumal Chellam, **P. Senthil Kumar**, Jeyamanikandan Venkatachalam, Selvakumar Periyasamy, R. Saravanan, *Environmental Pollution*, Vol. 301, pp. 119034, 2022, Clarivate, 9.988
- 📖 A review on bioremediation approach for heavy metal detoxification and accumulation in plants, P. R. Yaashikaa, **P. Senthil Kumar**, S. Jeevanantham, R. Saravanan, *Environmental Pollution*, Vol. 301, pp. 119035, 2022, Clarivate, 9.988
- 📖 Synthesis, computational and cytotoxicity studies of aryl hydrazones of β -diketones: selective Ni²⁺ metal responsive fluorescent chemosensors, Annamalai Subhasri, Subramanian Balachandran, Kumar Mohanraj, **P. Senthil Kumar**, Kumaravel Jeeva Jothi, Chinnadurai Anbuselvana, *Chemosphere*, Vol. 297, pp. 134150, 2022, Clarivate, 8.943

- 📖 Visible light stimulated binary nanostructure and defect enriched TiO₂-SnO₂ for photocatalysis and antibacterial activity, Lalitha Gnanasekaran, Saravanan Rajendran, **P. Senthil Kumar**, A.K. Priya, F. Gracia, Mohamed A. Habila, Karunamoorthy Saravanakumar, *Materials Letters*, Vol. 316, pp. 131998, 2022, Clarivate, 3.574
- 📖 Detection and identification of hazardous organic pollutants from distillery wastewater by GC-MS analysis and its phytotoxicity and genotoxicity evaluation by using *Allium cepa* and *Cicer arietinum* L., Pankaj Chowdhary, Anjali Singh, Ram Chandra, **P. Senthil Kumar**, Abhay Raj, Ram Naresh Bharagava, *Chemosphere*, Vol. 297, pp. 134123, 2022, Clarivate, 8.943
- 📖 PEG mediated tetragonal calcium molybdate nanostructures for electrochemical energy conversion applications, S. Swathi, R. Yuvakkumar, **P. Senthil Kumar**, G. Ravi, M. Thambidurai, Cuong Dang, Dhayalan Velauthapillai, *International Journal of Hydrogen Energy*, Vol. 47 (62), pp. 26013-26022, 2022, Clarivate, 7.139
- 📖 Nanochemistry approach for the fabrication of Fe and N co-decorated biomass-derived activated carbon frameworks: A promising oxygen reduction reaction electrocatalyst in neutral media, Hassan Karimi-Maleh, Onur Karaman, Fatemeh Karimi, Yasser Vasseghian, Li Fu, Mehdi Baghayeri, Jalal Rouhi, **P. Senthil Kumar**, Pau-Loke Show, Saravanan Rajendran, Afsaneh L. Sanati, Ali Mirabi, *Journal of Nanostructure in Chemistry*, Vol. 12, pp. 429-439, 2022, Clarivate, 8
- 📖 Algal biofuels: Technological perspective on cultivation, fuel extraction and engineering genetic pathway for enhancing productivity, P.R. Yaashikaa, M. Keerthana Devi, **P. Senthil Kumar**, *Fuel*, Vol. 320, pp. 123814, 2022, Clarivate, 8.035
- 📖 Insights on synthesis and applications of graphene-based materials in wastewater treatment: A review, A. Saravanan, **P. Senthil Kumar**, S. Srinivasan, S. Jeevanantham, M. Vishnu, K. Vishal Amith, R. Sruthi, R. Saravanan, Dai-Viet N. Vo, *Chemosphere*, Vol. 298, pp. 134284, 2022, Clarivate, 8.943
- 📖 Novel cobalt doped hafnium oxide/reduced graphene oxide nanosphere composite materials exhibit superior supercapacitor performance and long cyclic stability, P. Nethaji, P. Revathi, **P. Senthil Kumar**, *Sustainable Energy Technologies and Assessments*, Vol. 52, pp. 102167, 2022, Clarivate, 7.632
- 📖 Removal of toxic heavy metals using genetically engineered microbes: Molecular tools, risk assessment and management strategies, A. Saravanan, **P. Senthil Kumar**, B. Ramesh, S. Srinivasan, *Chemosphere*, Vol. 298, pp. 134341, 2022, Clarivate, 8.943

Projects Applied

- ⌚ **Dr. Pachimatla Rajesh, AP/Chem**, Project Titled "Nonlinear Electrochemical Impedance Spectroscopic studies on Double Layer Capacitance behaviour at Hybrid Electrolyte/Electrode Interface" applied for Start-up Research Grant 2023 (SERB). Duration - 2 Years; Budget - 28.63 Lacs.
- ⌚ **Dr. P. Senthil Kumar, Prof/Chem**, Project Title: Sustainable approaches on the conversion of domestic wastewater to potable water, PI: Dr. P. Senthil Kumar/Prof/Chemical, along with National and International Industry/Institute Partners, Total Budget (INR): 2,74,25,000. Funding Agency: United Nations Sustainable Development Group (UNSDG), New York
- ⌚ **Dr. V. Jaikumar, ASP/Chem**, Project Title: A detailed study on four different drugs from Siddha medicine on five different leading cancers in the world - Characterization of the drug, in-vitro and in-vivo studies in the animal model, applied for SERB CRG Grant 2023, Duration - 3 Years; Budget - 32.74 Lacs.

Guest lectures, Workshops and Webinars Organized

- ☂ **Dr. Nalinkanth V. Ghone, ASP/Chem** organized a guest lecture titled "Project Management for Chemical Engineers" delivered by industrial resource person, Mr. Kumaravel Panchapakesan, Former Vice President of Projects, Navin Fluorine International Limited, India, on 24th Feb 2023, at Chemical Engineering Seminar Hall, SSNCE for III and IV year students under the banner of AIChE Student chapter.
- ☂ **Dr. Nalinkanth V. Ghone ASP/Chem** Organized a guest lecture titled "Upskilling Chemical Engineer to CEO" delivered by Mr. Mr. Karthikeyan K S, Chief Executive Officer, Proklean Technologies Private Limited, Chennai on 29.03.23 for II, III, IV Year of study of students under the banner of SSN AIChE Student Chapter.
- ☂ **Dr. P. Senthil Kumar/Prof, Dr. Kilaru Harsha Vardhan, Dr. B. Chitra, Associate Profs** from Chemical Engineering Department organized the Faculty Development Programme on "Tips to Write Effective Research Papers for Quality Journals" during March 21-30, 2023.

- ☂ **Dr. B. Ambedkar, ASP/Chem** organized a "One Day Seminar and Hands-on Training on Innovative Approaches in the Carbon Capture Process." on 20th March 2023 (Monday): 10.00 am – 03.00 pm as a part of SSN IIC 5.0 activity.

Events Attended

- 👤 **Dr. Nalinkanth V. Ghone, Associate Prof** has attended seminar on the topic of "Role of Faculty in Startup Ecosystem" by Mr Venkkatesh, Co-Founder of Tender cuts on 17.01.23, organized by SSNi found and SSN IIC.
- 👤 **Dr. Nalinkanth V. Ghone, Associate Prof** has attended seminar organized by SSNiFound on "Awareness talk on the BIG 22 (Biotechnology Ignition Grant)" on 19th Jan, 2023.
- 👤 **Dr. P. Senthil Kumar, Prof/Chem** has attended 4 days GDC I-NITIATE Program scheduled from 21st to 24th of February 2023.
- 👤 **Dr. K. Jagannathan, ASP/Chem** has attended a 4-day workshop, "GDC I-NITIATE Programme" during 21-24 Feb 2023, organized by SSNiFound and Gopalakrishnan Deshpande Centre for Innovation & Entrepreneurship.
- 👤 **Dr. Nalinkanth V. Ghone, ASP/Chem** has attended four-day workshop on "Innovation and Entrepreneurship" (I-NITIATE program) by the Gopalakrishnan Deshpande Centre for Innovation & Entrepreneurship (GDC) I-NITIATE program and SSNiFound from 21st Feb 2023 to 24th Feb 2023.
- 👤 **Dr. B. Ambedkar, ASP/Chem** has attended four-day workshop on "Innovation and Entrepreneurship" (I-NITIATE program) by the Gopalakrishnan Deshpande Centre for Innovation & Entrepreneurship (GDC) I-NITIATE program and SSNiFound from 21st Feb 2023 to 24th Feb 2023.
- 👤 **Dr. Nalinkanth V. Ghone, Associate Prof**, has participated in the LEAN CANVAS BUSINESS MODEL COMPETITION, conducted exclusively for our faculty Startups (incubated and to be incubated) by The SSN Incubation Foundation and SSN IIC on 18th January 2023.
- 👤 **Dr. P. Senthil Kumar, Prof/Chem** Engineering acted as a Jury member to evaluate the proposals for "IEEE YESIST12 (Youth Endeavors for Social Innovation using Sustainable Technology)" on 31-03-2023, organized by IEEE Student Branch in association with Institution's Innovation Council, SSN College of Engineering.

- 👤 **Dr. K. Sathish Kumar, Prof/Chem, Dr. Nalinkanth V. Ghone, ASP/Chem and Dr. D. Gnana Prakash, ASP/Chem** visited Kongu Engineering College, Erode, on 13th March, 2023, to meet their NBA team (Chemical Engineering) and discuss about SAR report submission for NBA Tier I accreditation.

Viva-voce & DC meetings

- ⊕ **Dr. R Parthiban Prof/Chemical** conducted the first DC Meeting for his Full -time research scholar, Ms. M Subhashini on 19.12.2022.
- ⊕ **Dr. D. Balaji, ASP/Chem** conducted the confirmation DC Meeting for his full-time research scholar, Ms. Arasi R on 25.01.2023.
- ⊕ **Dr. R. Anantharaj, ASP/Chem** conducted the First DC Meeting for his full time Research Scholar, Ms. Nithiya Stree (Reg.No: 23245991140) on 01-02-2023.
- ⊕ **Dr. R. Anantharaj, ASP/Chem** conducted the First DC Meeting for his full time Research Scholar, Ms. Prathiksha Prabhakar (Reg.No: 23245991104) on 01-02-2023.
- ⊕ **Dr. D. Balaji, ASP/Chem** conducted the confirmation DC Meeting for his full-time research scholar, Mr. Thamaraiselvan A on 06.02.2023.
- ⊕ **Dr. R. Parthiban, Prof/Chem** conducted the first DC Meeting for his part-time research scholar, Ms. S. Kumaran on 21.03.2023 to finalize the course work.

Collaborations / MoU

- 🌀 **Dr. P. Senthil Kumar, Prof/Chemical Engineering** visited the Srinivas Solid Waste Management Company (SWMC), Chetpet-Chennai.

ALUMNI ACTIVITIES

Mr. Pradeep Kumar Tamilmani, alumnus of batch 2012-2016, visited the department of chemical engineering on 25th of January 2023. Mr. Pradeep interacted with the faculties and had a brief discussion with the HOD of chemical engineering, Dr. K. Sathish Kumar about department activities. Mr. Pradeep explained about his new start up named “Strategy Fox” <https://strategyfox.in/> that provides D2C services for clients and also he further discussed about his business model and its current stage of implementation.



STUDENT ACTIVITIES

Placements

Sl.No.	Name	Company	Category	Salary per annum (INR)
1	B Aishwarya	Schlumberger Limited	Core	6,00,000.00
2	Dinesh Kumar K S	TCS Digital	Dream	7,00,000.00
3	Divya Darshini P	First Solar	Core	4,50,000.00
4	Gayathri S	Haldor Topsoe	Core	7,20,000.00
5	Gnanasekar M S	Saint Gobain	Core	6,30,000.00
6	Harini P	Haldor Topsoe	Core	7,20,000.00
7	Jagannath S	SPIC	Core	4,80,000.00
8	Jennifer M	KBR	Core	6,00,000.00
9	Kanchana K	Tata Chemicals	Core	5,65,000.00
10	Malarkodi L	GEABGR	Core	3,00,000.00
11	Neeshanth S	Pickyourtrail	Regular	4,40,000.00
12	Persis J	Saint Gobain	Core	6,30,000.00
13	Surya K	JSW	Core	8,50,000.00
14	Viswanathan M	Qspiders	Regular	3,00,000.00

Internships

Sl.No.	Name	Company	Category
1	Balaji Muralikrishnan	WOOD	Core
2	Durga Gunasekar	WOOD	Core
3	A Gowthamraj	WOOD	Core
4	Joshua T	WOOD	Core
5	A Reshma	WOOD	Core
6	Sriram Gokula Krishnan R	WOOD	Core
7	Kishore S	WOOD	Core
8	Kanchana K	Cognizant	Regular
9	Supraja M	Cognizant	Regular
10	Ahamed Basith M M	Comcast	Dream
11	Kaavya A	Comcast	Dream

Co & Extra Curricular Activities

☞ **Dr. R. Anantharaj, ASP/Chem** with Final Year Chemical – UG Students went Industrial Visit to Dandeli, Gokarna and Bangalore during 19/11/2022 to 23/11/2023.

STEER 2023

STEER (Sustainable Trends in Energy and Environmental Resources), The Annual National Conference first took place in 2015. After witnessing the enormous success of the inaugural event, the ACE - IICHE Student Chapter has been organized it annually. This is the 9th edition of the conference conducted on March 16 & 17, 2023.

Mr. V Sriram, General Manager, CPCL Chennai, inaugurated and delivered the inaugural address to the participants. **Mr. Avijith Ghosh**, Honorary secretary, IICHE, Kolkata and **Dr. R. Parthiban**, Chairman, IICHE Chennai felicitated the occasion.

The following events conducted during the event

- Paper presentation – Oral and Poster
- Quest The Blast
- Clueminati
- Quiz
- Cook with Clues



Cook With Clues



Paper presentation “Chem-Xplore”

The depletion of resources and environmental issues that go along with it are becoming increasingly problematic as development moves forward. Energy supply, for instance, is largely provided by fossil fuels, which are non-renewable resources and, as a result, force us to seek alternative locations. It is of the utmost importance to provide sustainable solutions and address these issues in a manner that does not hinder availability for future generations. Similar to this, non-sustainable resources satisfy many demands.

The idea that led to the creation of STEER was to shed light on these issues and direct the current progress in the energy and environmental sectors toward finding solutions. It sets up a stage for people to examine new developments in a feasible manner and the downsides behind it. It creates a meeting point where knowledgeable guest speakers converse with younger students, share their knowledge of current research findings, and address issues. The event introduces us to a vast array of knowledge and concepts. It also discusses how the various chemical engineering

principles can be applied to real-world problems. In general, STEER exemplifies the cutting-edge nature of chemical engineering.



STEER 2023 Core Committee Members

Talent Showcase

Inter College Handball tournament

As an ardent sports player, I took part in the inter college handball tournament. Unfortunately, we faced a defeat in the first match against the Jeppiaar College of Engineering with a score of 6-9. Despite the loss, it was a valuable learning experience for our team, and I would like to share the details of the match and our observations.

Until this year there was no Handball team in our college. A couple of first years and second years got together to form the team. Most of the people in the team are new to the game unlike me and some others. We spent the 2 months before the zonals teaching new players rules and practising the basics of Handball. Since most of the team members are new they didn't have enough experience. This year it was only supposed to be a first

experience for the new players. I would say we displayed all the skills we practised to the best of our ability. We can win next year with determination and intense practise.

Our team went head-to-head with the skilled and competitive team, Jeppiyaar college in the opening match of the tournament. The match was intense and fiercely contested from the beginning, with both teams displaying their athleticism and tactical prowess.

First Half: During the first half, our team struggled to find their rhythm and faced some difficulties in breaking through the strong defense of the opponent. Jeppiyaar college capitalized on their offensive opportunities and managed to score several goals, taking the lead. Our team's defense performed admirably, but we were unable to match their scoring efficiency.

Second Half: In the second half, our team exhibited a commendable fighting spirit and improved their performance. The players adjusted their strategies, demonstrating better coordination and attacking tactics. However, Jeppiyaar college maintained their lead by taking advantage of the opportunities that arose. Our team showed determination and managed to score a few goals, closing the gap, but unfortunately, it wasn't enough to secure a victory. The final score stood at 6-9 in favor of Jeppiyaar.

I would also like to share the notes I took based on my observations and learning:

- ✚ **Defense:** Our team's defensive line showcased great resilience and managed to restrict the opponent's scoring opportunities to some extent. However, we need to enhance our marking and positioning to minimize the opponent's chances further.
- ✚ **Offensive Strategies:** Our attacking plays lacked precision and creativity, making it difficult to penetrate the opposing team's defense. We should work on developing more effective attacking strategies and quick passing combinations.
- ✚ **Team Communication:** Communication among the team members played a crucial role in our performance. Improving communication on the field will enhance coordination, enabling us to react swiftly and make better decisions during the game.
- ✚ **Physical Conditioning:** The match highlighted the importance of maintaining peak physical fitness. We need to focus on stamina, agility, and endurance training to sustain a high level of performance throughout the game.

To improve our performance for future tournaments, we have identified the following action points:

- ✚ Analyze and learn from our mistakes in this match, particularly in terms of offensive strategies and communication.
- ✚ Organize more training sessions focused on attacking plays, including drills to improve passing accuracy and offensive coordination.
- ✚ Strengthen defensive skills by practicing marking, positioning, and developing a solid understanding of defensive systems.
- ✚ Emphasize physical conditioning, incorporating regular fitness training sessions to enhance endurance and agility.
- ✚ Participate in friendly matches and practice games to further develop teamwork and enhance match experience.

We believe that with targeted efforts and continuous practice, our team will improve and perform better in upcoming tournaments.

- Report by Giridaran. S, II Year B.Tech., -Chemical Engineering

ANALYSIS OF VARIANCE AND ITS APPLICATIONS IN CHEMICAL ENGINEERING

Analysis of variance (ANOVA) is a statistical technique used to analyse the differences among means in a data set. It is widely used in various fields including chemical engineering to identify the significant differences between groups of data. The main purpose of ANOVA is to determine whether there is a statistically significant difference between the means of two or more groups.

ANOVA can be applied to various areas of chemical engineering such as process optimization, quality control, and experimental design. In process optimization, ANOVA is used to identify the factors that affect the process and to determine the optimal conditions for the process. In quality control, ANOVA is used to determine whether a process is stable or not. In experimental design, ANOVA is used to determine the effect of different variables on the response variable.

One of the applications of ANOVA in chemical engineering is in the analysis of experiments with multiple factors. For example, in a chemical reaction, there may be multiple factors such as temperature, pressure, and reactant concentration that can affect the reaction rate. ANOVA can be used to determine which factor has the most significant effect on the reaction rate. By identifying the most significant factor, the process can be optimized to increase the reaction rate.

Another application of ANOVA in chemical engineering is in the analysis of data from a process control system. In a process control system, data is continuously collected from various sensors and analysed to determine whether the process is within the desired

range. ANOVA can be used to analyse the data and identify the factors that are affecting the process. By identifying the factors, the process can be optimized to operate within the desired range.

In addition, ANOVA can also be used in chemical engineering to compare the performance of different products or processes. For example, ANOVA can be used to compare the performance of two different catalysts in a reaction. By comparing the performance, the best catalyst can be selected for the process.

In summary, ANOVA is a statistical technique that is widely used in chemical engineering to analyse the differences among means in a data set. It can be used in various areas of chemical engineering such as process optimization, quality control, and experimental design. ANOVA is particularly useful in the analysis of experiments with multiple factors and in the analysis of data from a process control system. By identifying the significant factors that affect the process, ANOVA can help to optimize the process and improve its performance.

However, it is important to note that ANOVA is a powerful tool, but it is not without its limitations. For example, ANOVA assumes that the data is normally distributed and that the variances of the groups are equal. If these assumptions are not met, the results of ANOVA may not be reliable. Therefore, it is important to carefully analyse the data and ensure that the assumptions of ANOVA are met before applying it to a data set.

In conclusion, ANOVA is a valuable statistical tool that has many applications in chemical engineering. By using ANOVA, engineers can identify the significant factors that affect a process, optimize the process, and improve its performance. However, it is important to carefully analyse the data and ensure that the assumptions of ANOVA are met before applying it to a data set.

- Article by R Sudarsan, IInd Year B. Tech., - Chemical Engineering

NSS Camp

Members from our department have always been active and dedicated members of the NSS unit, with an avid interest in working towards the betterment of the community. They have been involved in several activities, the first of which was the annual NSS camp held from 12th March 2023 to 18th March in partnership with Anna University. The unit adopted two schools – Government Elementary at Thandalam. Our student, Hamshavarthini S was a part of a group of fifty enthusiastic volunteers who performed various activities such as restoration and painting in the school. Additionally, they also organized soft skill training sessions for the students which resulted in motivating them and uplifting their spirits. Empowering the lives of students who may not have otherwise received the opportunity was one of the primary objectives which they successfully accomplished.

Efforts taken such as the above were lauded at the Award Ceremony, organized by the NSS Cell of Anna University on the 28th of April. The grand event took place at the

prestigious Vivekananda Auditorium, located within the premises of Anna University in Chennai. A group of 42 NSS volunteers including Hamshavarthini S, Balan P, Kallki Selvan and Satish Kumar K. The ceremony was graced by distinguished Chief Guest, Mr. Udhayanithi Stalin, the Minister for Youth Welfare and Sports Development in the Government of Tamil Nadu. He proudly addressed the audience and spoke about the Naan Mudhalvan scheme, which was initiated to inspire the youth of the state in order to bring about positive change in the nation. Following the speech, the eagerly anticipated event which was the distribution of awards took place. Finally, in order to express gratitude and appreciation, a portrait of was gifted to Mr. Udhayanidhi Stalin, by Kallki Selvan, a dedicated NSS volunteer from our department, thus concluding the event which was filled with a sense of accomplishment and served as a source of motivation, as they witnessed their fellow volunteers being recognized and honoured for their exemplary contributions.

The next event that was held was an insightful visit to the Design thinking lab in Intellect, SIPCOT IT park, Siruseri on the 05th of May. Students Hamshavarthini S, Kallki Selvan, Satish Kumar K and Fahmida S were part of the group that visited the laboratory where the thought process involved in design thinking and its applications were outlined. They were trained to think beyond the two-dimensional perspectives that we as humans have forced ourselves in. The event proved to be an excellent opportunity for the volunteers to learn about various aspects of problem-solving and how to work towards solutions that better our community.

And finally the most recent event held was the beach clean-up organised in collaboration with the Environmentalist Foundation of India (EFI) on the 13th of May. This remarkable endeavour involved a large group of dedicated volunteers including Hamshavarthini S and Kallki Selvan. Through their unwavering dedication, the volunteers managed to collect 30 bags of waste creating a largely positive impact on the environment. The event resulted in a newfound interest in working towards preserving our beaches and protecting them from the pollution that continues to infest them.

The series of events held were all eye opening experiences that taught our students things that go beyond the classrooms. They aided in understanding that the true essence in life lies in helping out the community that you live in and seeking fulfilment from it. These valuable lessons will be ones that they carry with them for the years to come.

- Report by Fathema Fahmida Sulaiman, II Year B.Tech., -Chemical Engineering

SYMPOSIUM AT TNPCB - WASTE TO WEALTH

“Preserve and cherish the pale blue dot, the only home we’ve ever known.” ~ Carl Sagan

The Central Pollution Control Board (CPCB) conducted a symposium on the topic of Waste to Wealth at Tamilnadu pollution control board (TNPCB), Guindy on 28th April 2023. In the symposium, findings of scientific work related to biomining of legacy waste, circular economy, waste to renewable energy, bio methanation, composting, elimination of single-use plastic with digital intervention, integrated solid waste management, and the future of plastics were discussed with the group of experts. The symposium largely discussed the

features of the newly added “Mann ki baat” episodes centering on the conservation of the environment.

An invitation was extended for the students and the lecturers of the chemical engineering department to attend this symposium to gain an understanding of the various large-scale techniques developed to reduce, reuse and recycle our waste. The panel members present were Dr. Prashant Gargava – Member secretary of CPCB; Shri Shiv Das Meena – The Additional Chief Secretary to Govt., Tamilnadu; Shri Vinod Babu – Director, CPCB; Dr. P.S.G. Krishnan – Principal Director (TSS & BD), CIPET Chennai; Divya Sinha – Director, CPCB. Sh. R. Kannan - Member Secretary, TNPCB and Sh.H.C. Girish – Member Secretary, Karnataka State Pollution Control Board were invited as Chief Guest to the Symposium.

This symposium served as a glimpse into the world of environmental engineering, showcasing around environmental engineer’s work. They play a crucial role in mitigating the adverse impacts of human activities on our planet. A total of twelve projects were presented during the session. Through these presentations, the participants were able to grasp some knowledge of the innovative techniques developed to address pressing issues such as pollution, resource depletion, and climate change. Technologies used for recovery of energy from paddy straw as well as from cow dung generated in the goshala were highlighted during the Workshop. Status of waste management of technologies for Solid Waste Management including Waste to Energy plant, Bio-methanation, composting as well as the way forward for these technologies were presented during the Symposium. Working of Integrated Waste Management was illustrated during the Symposium. Further, for plastic waste management, approach adopted for the elimination of Single Use Plastic & promotion of alternatives and its impact was presented in the symposium. The symposium demonstrated the importance of adopting holistic approaches that consider the interconnectedness of environmental, social, and economic factors. A deeper understanding of emerging trends in waste management is gained which are instrumental in creating a more sustainable future.

Smruthi P, Dharunya S, Abinaya S, Murali, Natrajan, Padmanabhan, Roshan, Prithviraj, and Kamalakannan of 2nd year, attended this lecture. Prominent members of the CPCB and TNPCB were present. All attendees were given a jute bag in an initiative to reduce the use of plastics.

- Report by Abinaya S, II Year B.Tech., -Chemical Engineering

ENTREPRENEURSHIP CLUB EXPERIENCE

This is Vaibavasri from Chemical department second year writing an article about the club events in which I was in the Organising Committee(OC). I am a member of our college entrepreneurship cell EDC – Lakshya club where they have flagship events, workshops and many other events related to entrepreneurship lined up throughout the year. As a part of organising those events, I have contributed as a OC member for the following events of EDC. ‘Marketize 2.0’ is an event organised by Lakshya on 25th November where it involves student’s participation and the event has a total of three rounds with treasure hunt being one of it. I have contributed by working on the event structure and sold the

highest number of tickets for it. Next up 'Masterminds' is also an event involving simple theme of 'guess the logo' where students will find the logo/brand name within the given time limit. The event was completely organised by myself and one more person from the other department. Following that, Lakshya conducted their three flagship events one after the other. One was 'Mela' which was held on 24th February, is an event in which students will put up stalls of their own interest on the day of the event and sell their products to the people. I also served as a OC for the same. During Instincts, Lakshya organised their next flagship event 'Udaan' held on 9th March where a group of students will learn about entrepreneurship in three rounds of fun. I served as OC by designing, working on structure and management of the event. Another flagship event was 'SYCoN' which was held on 19th April. It's an event in which entrepreneurs from various sectors and fields would come on the day of the event and share their life experiences and talk about entrepreneurship. I did my part as OC by helping out in poster designing, sponsorship, finding speakers and being an emcee on the day of the event. It was a great opportunity working for EDC- Lakshya as I learned and explored new things not only related to entrepreneurship but also in terms of other stuffs. If you are a person who is likely to do business or love entrepreneurship or curious about what this club is, then definitely our college EDC – Lakshya club would be a great platform for you to explore and learn. Hope I gave you all a glimpse of what Lakshya club is all about. Thank you so much for our department for giving me the opportunity to write an article about this.

- Article by Vaibavasri S, II Year B.Tech., -Chemical Engineering

Portrait of Wednesday Addams (Jenna Ortega)



- Art by Vaibavasri S, II Year B.Tech., -Chemical Engineering

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