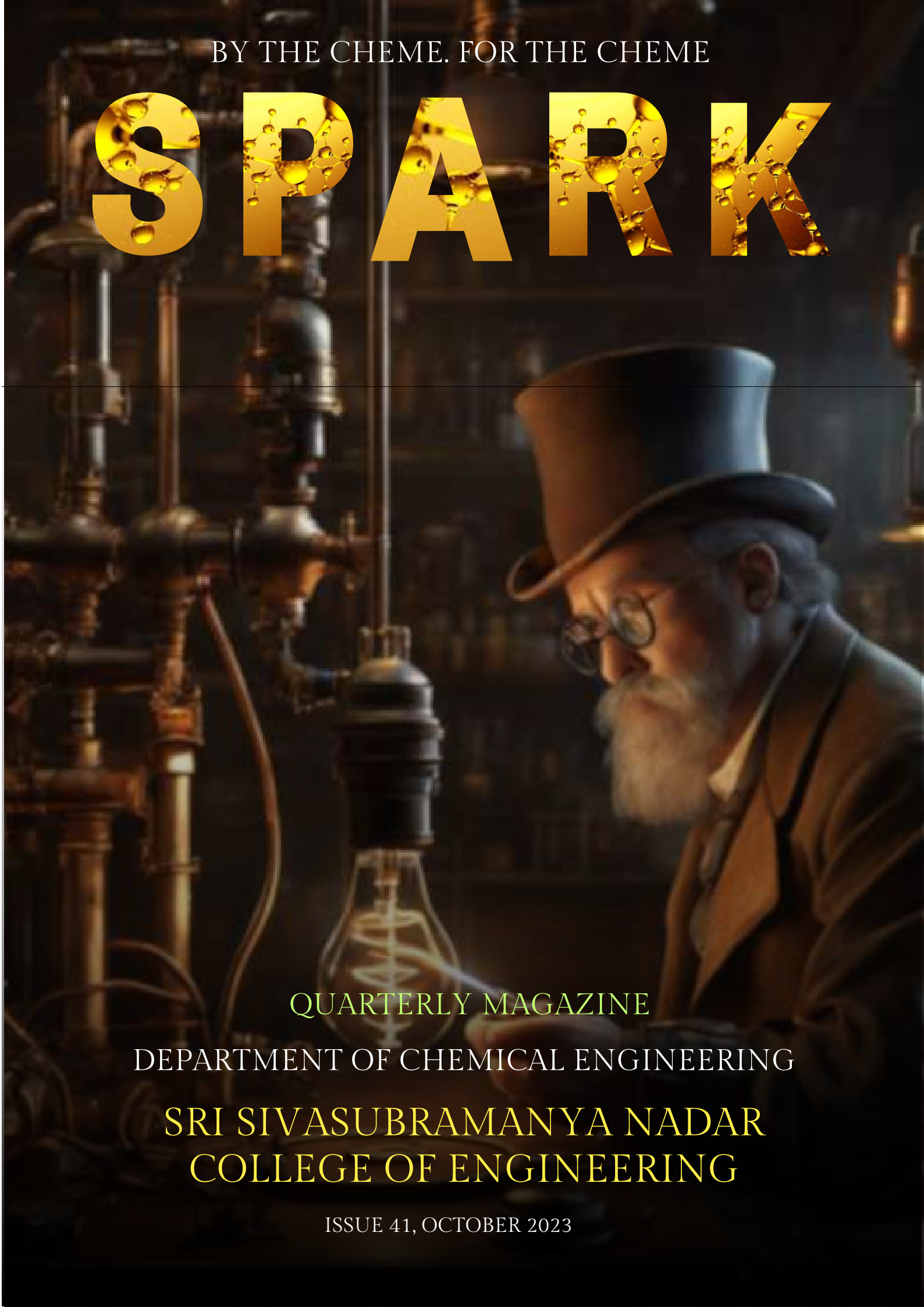
BY THE CHEME. FOR THE CHEME

SPARK



QUARTERLY MAGAZINE

DEPARTMENT OF CHEMICAL ENGINEERING

SRI SIVASUBRAMANYA NADAR COLLEGE OF ENGINEERING

ISSUE 41, OCTOBER 2023

Quarterly Magazine of the Department of Chemical Engineering

EDITION 41

OCTOBER 2023

Highlights in this Newsletter

From HOD's Desk

I am delighted to present the 41st issue of our Department Newsletter SPARK. The primary focus of this edition is the range of academic endeavours undertaken by our faculty and students. One of our academic members filed two patents on the removal of heavy metals from water, and they were credited for publishing their research findings in the journal with the highest impact factor. These are just a few of their noteworthy accomplishments.

By pooling our expertise in academic and research-related endeavours for the good of the environment and society, we also have a strong industrial partnership. Our alumni offered a variety of interactive sessions and seminars to help our students improve their academic skills.

I also want to express my gratitude to the students who sent in articles and photos for this edition of Spark. Lastly, I would like to express my gratitude to the faculty and student editors for their tireless efforts in getting this issue out on time.

Dr. K. Sathish Kumar
Professor & Head
Department of Chemical Engineering

FACULTY ACTIVITIES

Awards & Recognition

✪ **Dr. R. Anantharaj, Associate Professor/Chemical Engineering** delivered a guest lecture on "Understanding the Science behind Alcohol-Free Sanitizers" during A Days Training Programme for Self Help Groups (SHG) for Women on "Low-Cost Alcohol-free Hand Sanitizer Preparation and Revenue Benefits" Catalyzed and Financially Supported By Tamil Nadu State Council For Science And Technology at IFET College of Engineering (Autonomous Institution), Valavanur, Villupuram, on 07.07.2023.

✪ **Dr. P. Senthil Kumar, Professor/Chemical Engineering** delivered a Guest Lecture on "Life Cycle Assessment" during thePDP-60, "Realms of Environmental, Social and Governance: Way to Sustainable Entrepreneurship", organized by NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH (NITTTR), Ministry of Education, Government of India on 05-07-2023.

✪ **Dr. P. Senthil Kumar, Professor/Chemical Engineering** has been invited as a Special Invitee and Member - Expert Panel for the startup pitch session to evaluate startups in the Demo Day session during the "City Innovation Exchange Bootcamp + Demo Day" organized by Forge Innovation & Ventures at iTNT HUb, CEG-AU Campus, Chennai on 29-07-2023

✪ **Dr. P. Senthil Kumar, Professor/Chemical Engineering** has been nominated as an Anna University represented Doctoral Committee member for the research candidate Ms. Neelu Mishra, Full Time Research Scholar, St. Joseph's College of Engineering, Chennai.

✪ **Dr. P. Senthil Kumar, Professor/Chemical Engineering** has been nominated as an Anna University Doctoral Committee member for the research candidate Ms. M. Hinduja, Full Time Research Scholar, BIT Campus, Anna University, Tiruchirappalli and convened the first DC meeting on 31-07-2023

✪ **Dr. P. Senthil Kumar, Professor/Chemical Engineering** has been invited as a Speaker - UTAR ICP and R&D Colloquium 2023 organized by Universiti Tunku Abdul Rahman (UTAR), Malaysia and it will be held on 21st October 2023.

✪ **Dr. P. Senthil Kumar, Professor/Chemical Engineering** acted as a Doctoral Committee Member for the DC Confirmation Meeting of the candidate, Ms. R. Gomathi, Full Time Research Scholar at KPR Institute of Engineering & Technology, Coimbatore on 17-07-2023

✪ **Dr. P. Senthil Kumar, Professor/Chemical Engineering** acted as a Chief Superintendent for the May 2023, Phase - III examinations

✪ **Dr. K. Sathish Kumar, Professor/Chemical Engineering** delivered a guest Lecture on "Removal of Organic dyes from Nano graphene exfoliated from waste Batteries" at the Department of Chemical Engineering, Sathyabama University, Chennai on 08.08.2023.

✪ **Dr. Nalinkanth V. Ghone, Associate Professor/Chemical Engineering** served as a jury member for the Internal Hackathon at institutional level on 23rd September 2023 to select the top 35 teams to submit the ideas for SIH 2023 Grand Finale of World's Biggest Open Innovation Model 2023 Regional Round.

✪ **Dr. Nalinkanth V. Ghone**, **Associate Professor/Chemical Engineering** showcased his innovative startup "NCAPS Formulations" to the Special Jury at the SSN Innovation Day, held on September 6, 2023

✪ **Dr. Anup Kundu, Assistant Professor**, delivered a guest Lecture on "Active learning Fluid Mechanics module and introducing Slido app" at the Department of Civil Engineering, SSN College of Engineering, Chennai on 8th September 2023.

Journal & Book Chapter Publications

📖 Adsorptive removal of acid blue dye 113 using three agricultural waste biomasses: The possibility of valorization by activation and carbonization – A comparative analysis, Swetha Sunkar, P. Prakash, Balaji Dhandapani, Omirserik Baigenzhenov, J. Aravind Kumar, Valli Nachiyaar, Sara Zolfaghari, Sara Tejaswini, Ahmad Hosseini-Bandegharaei, Environmental Research, Volume 233, 116486, 2023, Clarivate, 8.3

📖 Experimental Density, Volumetric Properties of DESs Based on Tetrabutylammonium Bromide and Used for Effective Extraction of Naphthol Green B and Malachite Green, Beevi Fathima Mohamed Thamby, Vivek Mariappan Santhi, Anantharaj Ramalingam, Journal of Chemical Technology and Biotechnology, NA, 2023, Web of Science, 3.709

📖 Green synthesis of a photocatalyst Ag/TiO2 nanocomposite using Cleistocalyx operculatus leaf extract for degradation of organic dyes, Tran Hung Nguyen, Nhat Huy Hoang, Chinh Van Tran, P.T.M. Nguyen, Trung-Dung Dang, W. Jin Chung, S. Woong

Chang, D. Duc Nguyen, P.Senthil Kumar, Duong Duc L, Chemosphere, Vol. 306, pp. 135474, 2022, Clarivate, 8.8

- IGZO-decorated ZnO thin films and their application for gas sensing, Sunil Babu Eadi, Han Yan, P.Senthil Kumar, R.Yuvakkumar, Hi-Deok Lee, Environmental Research, Vol. 214, pp. 113796, 2022, Clarivate, 8.3
- Photocatalytic degradation of methylene blue dye using newly synthesized Zirconia nanoparticles, Ramesh Vinayagam, Bhawesh Singhania, Gokulakrishnan Murugesan, P.Senthil Kumar, Ruchi Bhole, Manoj Kumar Narasimhan, Thivaharan Varadavenkatesan, Environmental Research, Vol. 214, pp. 113785, 2022, Clarivate, 8.3
- Carbon dioxide methanation on heterogeneous catalysts: a review, Cham Q. Pham, Mahadi B. Bahari · P.Senthil Kumar, Shams Forruque Ahmed, Leilei Xiao, Sunil Kumar, Amjad Saleh Qazaq, Tan Ji Siang, Huu-Tuan Tran, Aminul Islam, Adel Al-Gheethi, Yasser Vasseghian, Dai-Viet N. Vo, Environmental Chemistry Letters, Vol. 20, pp. 3613-3630, 2022, Clarivate, 15.7
- Plant-mediated gold and silver nanoparticles as detectors of heavy metal contamination, Sneha Nayak, Louella Concepta Goveas, P.Senthil Kumar, Raja Selvaraj, Ramesh Vinayagam, Food and Chemical Toxicology, Vol. 167, pp. 113271, 2022, Clarivate, 4.3
- Laccase production by Pleurotus ostreatus using cassava waste and its application in remediation of phenolic and polycyclic aromatic hydrocarbon contaminated lignocellulosic biorefinery wastewater, Vaidyanathan Vinoth Kumar, Swethaa Venkataraman, P.Senthil Kumar, Jenet George, Devi Sri Rajendran, Anna Shaji, Nicole Lawrence, Kongkona Saikia, Abiram Karanam Rathankumar, Environmental Pollution, Vol. 309, pp. 119729, 2022, Clarivate, 8.9
- Heterostructured γ-Fe2O3/FeTiO3 magnetic nanocomposite: An efficient visible-light-driven photocatalyst for the degradation of organic dye, N. Subha, M. Mahalakshmi, S. Monika, P. Senthil kumar, V. Preethi, G. Vaishnavi, A. Rajabhuvaneswari, Chemosphere, Vol. 306, pp. 135631, 2022, Clarivate,
- Threats, challenges and sustainable conservation strategies for freshwater Biodiversity, Shams Forruque Ahmed, P. Senthil Kumar, Maliha Kabir, Fatema Tuz Zuhara, Aanushka Mehjabin, Nuzaba Tasannum, Anh Tuan Hoang, Zobaidul Kabire, M. Mofijur, Environmental Research, Vol. 214, pp. 113808, 2022, Clarivate, 8.3
- A. Saravanan, P. Senthil Kumar, Biochar derived carbonaceous material for various environmental applications: Systematic review, Environmental Research, Vol. 214, pp. 113857, 2022, Clarivate, 8.3
- Engineering microbes for enhancing the degradation of environmental pollutants: A detailed review on synthetic biology, P.R. Yaashikaa, M. Keerthana Devi, P. Senthil Kumar, Environmental Research, Vol. 214, pp. 113868, 2022, Clarivate, 8.3

- 🕮 Treatment of mixed azo dyes in an aerobic sequential batch reactor and toxicity assessment using Vigna radiata, T. Akshaya Vidhya, K. Veena Gayathri, P. Senthil Kumar, Gayathri Rangasamy, Tasneem M Kathawala, International Journal of Chemical Engineering, Vol. 2022, pp. 1-2, Article ID 7083772, 2022, Clarivate, 2.8
- 🕮 Biohydrogen Production: An outlook on methods, constraints, economic analysis and future prospect, P.R. Yaashikaa, M. Keerthana Devi, P. Senthil Kumar, International Journal of Hydrogen Energy, Vol. 47(98), pp. 41488-41506, 2022, Clarivate, 7.2
- 🕮 The consequence of Mg and Mn doping on the structure, photoluminescence, morphology, photocatalytic performance properties of t,m-ZrO2 nanoparticles fabricated by the co-precipitation method, G. Rajesh, S. Akilandeswari, P. Senthil Kumar V.Uma Shankar, M.Ramya, K.Nirmala, Applied Nanoscience, Vol. 13, pp. 3839–3851, 2023, Clarivate, 3.869
- 🕮 A review on synthesis methods and recent applications of nanomaterial in wastewater treatment: Challenges and future perspectives, A. Saravanan, P. Senthil Kumar, R.V. Hemavathy, S. Jeevanantham, Marie Jyotsna Jawahar, J.P. Neshaanthini, R. Saravanan, Chemosphere, Vol. 307, pp. 135713, 2022, Clarivate, 8.8
- 🕮 Biosensor for heavy metals detection in wastewater: A review, Karthik Velusamy, Selvakumar Periyasamy, P. Senthil Kumar, Gayathri Rangasamy, J. Mercy Nisha Pauline, Pradeep Ramaraju, Sneka Mohanasundaram, Dai-Viet Nguyen Vo, Food and Chemical Toxicology, Vol. 168, pp. 113307, 2022, Clarivate, 4.3
- 🕮 Modeling of degradation ability for starch-based biodegradable polymer film using ANFIS, Chitra Boobalan, Abhishek Venkatesh, Dhakshin Shravan Ramgopal, MRS Advances, 2023, Scopus, 0.8
- 🕮 Investigation of Nafion coated GO-ZnO nanocomposite behaviour for sulfamethoxazole detection using cyclic voltammetry, P. Senthil Kumar, B.S. Sreeja, K. Krishna Kumar, G. Padmalaya, Food and Chemical Toxicology, Vol. 167, pp. 113311, 2022, Clarivate 4.3
- 🕮 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, Vol. 53, pp. 102549, 2022, Clarivate 8
- 🕮 Endurance of COVID 19 in Wastewater, Natural Prescription and Antiviral Medication for the Analysis of COVID 19 and its Effects on the Development of New Antiseptic Strategies, R. Sivaranjanee, P. Senthil Kumar, Gayathri Rangasamy, Total Environment Research Themes, Vol. 3-4, pp. 100010, 2022, Scopus,
- 🕮 Biodegradation of textile dye Rhodamine-B by Brevundimonas diminuta and sscreening of their breakdown metabolites, Swetha Saravanan, Femina Carolin C, P. Senthil Kumar, B. Chitra, Gayathri Rangasamy, Chemosphere, Vol. 308, pp. 136266, 2022, Clarivate 8.8

- Treatability studies on the optimization of ozone and carbon dosages for the effective removal of contaminants from secondary treated effluent, P. Ganesh Kumar, S. Kanmani, P. Senthil Kumar, Adsorption Science & Technology, Vol. 2022, Article ID 1998549, pp. 1-14, 2022, Clarivate 2.9
- Experimental investigation of the electrochemical detection of sulfamethoxazole using copper oxide-MoS2 modified glassy carbon electrodes, M. Ramya, P. Senthil Kumar, Gayathri Rangasamy, V. Uma Shankar, G. Rajesh, K. Nirmala, Environmental Research, Vol. 216, pp. 114463, 2023, Clarivate 8.3
- Assessment of product distribution of plastic waste from catalytic pyrolysis process, Fetcia Jackulin Christopher, P. Senthil Kumar, Lakshmipriya Jayaraman, Gayathri Rangasamy, Fuel, Vol. 332, pp. 126168, 2023, Clarivate 7.4
- Valorization of micro-algae biomass for the development of green biorefinery: Perspectives on techno-economic analysis and the way towards sustainability, A. Saravanan, P. Senthil Kumar, Michaël Badawi, Gunda Mohanakrishna, Tejraj M. Aminabhavi, Chemical Engineering Journal, Vol. 453, pp. 139754, 2023, Clarivate 15.1
- Sustainable production of biohydrogen from algae biomass: Critical review on pretreatment methods, mechanism and challenges, S. Karishma, A. Saravanan, P. Senthil Kumar, Gayathri Rangasamy, Bioresource Technology, Vol. 366, pp. 128187, 2022, Clarivate 11.4
- Perovskite solar cells: Thermal and chemical stability improvement, and economic analysis, Shams Forruque Ahmed, Nafisa Islam, P. Senthil Kumar, Anh Tuan Hoang, M. Mofijure, Abrar Inayat, GM Shafiullah, Dai-Viet N. Vo, Irfan Anjum Badruddin, Sarfaraz Kamangar, Materials Today Chemistry, Vol. 27, pp. 101284, 2023, Clarivate 7.3
- Three-phase partitioning for the separation of proteins, enzymes, biopolymers, oils, and pigments: a review, Devi Sri Rajendran, Ashok Chidambaram, P. Senthil Kumar, Swethaa Venkataraman, Shanmugaprakash Muthusamy, Dai-Viet Nguyen Vo, Gayathri Rangasamy, Vasanth Kumar Vaithyanathan, Vinoth Kumar Vaidyanathan, Environmental Chemistry Letters, Vol. 21, pp. 911-934, 2023, Clarivate 15.7
- Adsorptive removal of Alizarin Red S onto Sulphuric acid modified Avocado seeds: Kinetics, Equilibrium and Thermodynamic studies, G. Bharath Balji, P. Senthil Kumar, Adsorption Science & Technology, Vol. 2022, Article ID. 3137870, pp. 1-13, 2022, Clarivate 2.9
- Electrodeionization: Principle, techniques and factors influencing its performance, P. Senthil Kumar, M. Varsha, B. Senthil Rathi, Gayathri Rangasamy, Environmental Research, Vol. 216, pp. 114756, 2023, Clarivate 8.3
- GO/ZnO nanocomposite - as transducer platform for electrochemical sensing towards environmental applications, P. Senthil Kumar, Padmalaya G, N. Elavarasan, B.S. Sreeja, Chemosphere, Vol. 313, pp. 137345, 2023, Clarivate 8.8

- Fabrication of a novel Ni-doped CdAl2O4 nanoparticles and applications in photo-oxidation processes under visible light illumination, G. Rajesh, P. Senthil Kumar, Gayathri Rangasamy, S. Akilandeswari, Aindrila Mandal, V.Uma Shankar, M.Ramya, K.Nirmala, K.Thirumalai, Molecular Catalysis, Vol. 535, pp. 112835, 2023, Clarivate 4.6
- A review on the applicability of adsorption techniques for remediation of recalcitrant pesticides, Sanchali Bose, P. Senthil Kumar, Gayathri Rangasamy, G. Prasannamedha, S. Kanmani, Chemosphere, Vol. 313, pp. 137481, 2023, Clarivate 8.8
- A comprehensive review on novel quaternary metal oxide and sulphide electrode materials for supercapacitor: Origin, fundamentals, present perspectives and future aspects, Isacfranklin Melkiyur, Yuvakkumar Rathinam, P. Senthil Kumar, Asaithambi Sankaiya, Selvakumar Pitchaiya, Ravi Ganesan, Dhayalan Velauthapillai, Renewable & Sustainable Energy Reviews, Vol. 173, pp. 113106, 2023, Clarivate 15.9
- A synergistic consequence of catalyst dosage, pH solution and reactive species of Fe-doped CdAl2O4 nanoparticles on the degradation of toxic environmental pollutants, G. Rajesh, P. Senthil Kumar, S. Akilandeswari, Gayathri Rangasamy, Aindrila Mandal, V.Uma Shankar, M.Ramya, K.Nirmala, K.Thirumalai, Chemosphere, Vol. 318, pp. 137919, 2023, Clarivate 8.8
- Biodegradation of Chlorpyrifos pesticide by Meiothermus silvanus DSM 9946 isolated from agricultural runoff, Sanchali Bose, P. Senthil Kumar, Desalination and Water Treatment, Vol. 287, pp. 103-115, 2023, Clarivate 1.1
- Strategies for ameliorating the photodegradation efficiency of Mn-doped CdAl2O4 nanoparticles for the toxic dyes under visible light illumination, G. Rajesh, P. Senthil Kumar, S. Akilandeswari, Gayathri Rangasamy, S. Lohita, V.Uma Shankar, M.Ramya, K.Nirmala, K.Thirumalai, Chemosphere, Vol. 321, pp. 138069, 2023, Clarivate 8.8
- Various surface-active agents used in flotation technology for the removal of noxious pollutants from wastewater: a critical review, G. Pooja, P. Senthil Kumar, Environmental Science: Water Research & Technology, Vol. 9, pp. 994-1007, 2023, Clarivate 5
- Fabrication of an effectual, stable and reusable Mg-doped CdAl2O4 nanoparticles for photodegradation of toxic pollutants under visible light illumination, S. Mahalaxmi, G. Rajesh, P. Senthil Kumar, S. Akilandeswari, M. Arul Joshua, V. Uma Shankar, M. Ramya, K. Thirumalai, Gayathri Rangasamy, Chemosphere, Vol. 322, pp. 138178, 2023, Clarivate 8.8
- Preparation and characterization of a novel cobalt-substitution cadmium aluminate spinel for the photodegradation of azo dye pollutants, G. Rajesh, P. Senthil Kumar, S. Akilandeswari, Gayathri Rangasamy, S. Lohita, V.Uma Shankar, M.Ramya, K.Thirumalai, Chemosphere, Vol. 323, pp. 138232, 2023, Clarivate 8.8

- Advances in enzymatic conversion of biomass derived furfural and 5-hydroxymethylfurfural to value-added chemicals and solvents, VinothKumar Vaidyanathan, KongkonaSaikia, P. Senthil Kumar, Abiram Karanam Rathankumar, Gayathri Rangasamy, Ganesh Dattatraya Sarataleh, Bioresource Technology, Vol. 378, pp. 128975, 2023, Clarivate 11.4
- MXenes and MXene-Based Materials for Removal and Detection of Water Contaminants: A Review, Keerthiga Gopalram, Ashish Kapoor, P. Senthil Kumar, Anagha Sunil, Gayathri Rangasamy, Industrial & Engineering Chemistry Research, Vol. 62(17), pp. 6559-6583, May 2023, Clarivate 4.2
- A selective analysis of Sulfamethoxazole – trimethoprim in tablet formulations using Graphene Oxide-Zinc Oxide Quantum Dots based nanocomposite modified glassy carbon electrode, P. Senthil Kumar, Padmalaya G, N. Elavarasan, B.S. Sreeja, Chemosphere, Vol. 332, pp. 138814, August 2023, Clarivate 8.8
- Simultaneous detection of uric and ascorbic acids by AuNPs electrodeposited on the GCE surface, S. Denisdon, P. Senthil Kumar, A. John Jeevagan, T. Adinaveen, P. Muthukumar, M. Amalraj, Applied Nanoscience,https://doi.org/10.1007/s13204-023-02869-4, 2023, Clarivate 3.869
- A critical review on biochar for environmental applications, R. Sivaranjanee, P. Senthil Kumar, Gayathri Rangasamy, Carbon Letters, Vol. 33, pp. 1407-1432, 2023, Clarivate 4.5
- Techno-economic and environmental sustainability prospects on biochemical conversion of agricultural and algal biomass to biofuels, A. Saravanan, P.R. Yaashikaa, P. Senthil Kumar, A.S. Vickram, S. Karishma, R. Kamalesh, Gayathri Rangasamy, Journal of Cleaner Production, Vol. 414, pp. 137749, August 2023, Clarivate 11.1
- A recent advancement on hydrothermal carbonization of biomass to produce hydrochar for pollution control, R. Sivaranjanee, P. Senthil Kumar, Gayathri Rangasamy, Carbon Letters,https://doi.org/10.1007/s42823-023-00576-2, 2023, Clarivate 4.5
- Lignocellulosic biomass-based glycoconjugates for diverse biotechnological applications, Cristiano E. Rodrigues Reis, Thais Suzane Milessi, Marcio Daniel Nicodemos Ramos, Akhilesh Kumar Singh, Gunda Mohanakrishna, Tejraj M. Aminabhavi, P. Senthil Kumar, Anuj K. Chandel,, Biotechnology Advances, Vol. 68, pp. 108209, November 2023, Clarivate 16
- Bioprocessing of plastics for sustainable environment: Progress, challenges, and prospects, K Rambabu, G Bharath, Muthusamy Govarthanan, P. Senthil Kumar, Pau Loke Show, Fawzi Banata, Trends in Analytical Chemistry, Vol. 166, pp. 117189, September 2023, Clarivate 13.1
- Strength, mineralogical and microstructural studies on clayey soil stabilized by bio-stabilized waste ash with lime, Arunthathi S, Balaji D and Sivapriya V, Journal of Material Cycles and Waste Management,Nil, 2023, Clarivate 3.1

- Synthesis and characterization of granite dust microparticles reinforced bio-benzoxazine composites, 62. Chandramohan Ayyavu, Parthiban Rangasamy, Sathishkumar Kannaiyan, Dinakaran Kannaiyan, Alagar Muthukaruppan, Polymers from Renewable Resources, 2023, Scopus, 0.513
- A review on biofilm-based reactors for wastewater treatment: Recent advancements in biofilm carriers, kinetics, reactors, economics, and future perspectives, Shabnam Murshid, Adithya Joseph Antonysamy, Gnana Prakash Dhakshinamoorthy, Arun Jayaseelan, Arivalagan Pugazhendhi, Science of the Total Environment,892 and 164796, 2023, Clarivate, 10.754
- Immersed boundary method-based fluid–structure–thermal interaction solver with conjugate heat transfer, Hemanshul Garg, Anup Kundu, Atul Kumar Soti & Rajneesh Bhardwaj, Sādhanā,48, 200, 2023, Scopus, 1.6

Projects Applied

- **Dr. R. Anantharaj Ph.D**, **Associate Professor/Chemical Engineering**, Experimental Investigation of Isolation of Cardanol from Cashew Nut Shell Liquid using Efficient Green Catalyst, PI: Dr. R. Anantharaj/ASP/Chem, Total Budget (INR): 500000. Funding Agency: Tamil Nadu State Council for Science and Technology.
- **Dr. R. Anantharaj Ph.D**, **Associate Professor/Chemical Engineering**, Simultaneous Dechlorination and Decolourization of Industrial Wastewater using Deep Eutectic Solvent: Quantum Chemical Calculations and Experiments. PI: Dr. R. Anantharaj/ASP/Chem, Total Budgett (INR): 7737087. Funding Agency: Department of Science and Technology (DST) - Under the scheme of Water Technology Cell (WTC).
- **Dr. D. Balaji Ph.D**, **Associate Professor/Chemical Engineering**, Project Title: Utilization of bio-dried digestate: A green binding material in soil stabilization, PI: Dr. Balaji D, ASP/Chem, Co-PI : Dr. S. V. Sivapriya, ASP/Civil, Total Budget (INR): 4,35,000. Funding Agency: Tamil Nadu State Council for Science and Technology.
- **Dr. Nalinkanth V. Ghone**, **Associate Professor/Chemical Engineering**, An International Internship offer was submitted to RISE Worldwide (Research Internships in Science and Engineering), DAAD, funded by the German Federal Ministry of Education and Research, to work on the project titled "Value added regeneration of clay nanotube adsorbent for CO_2 capture" for a duration of three months.
- **Dr. Nalinkanth V. Ghone**, **Associate Professor/Chemical Engineering**, Project Title: Economical Regeneration of Clay Nanotube Adsorbent for CO2 Capture, Students: Dharmesh Kumar and Yugesh B P, Final Year, Chemical Engg, Mentor: Dr. Nalinkanth V. Ghone / ASP/ Chemical Engg, Total Budget (INR): 10,200. Funding Agency: TNSCST Student Project Scheme 2023

- Kaviarasan V S, Sanjnaa S and Santosh Krishna R B of III YEAR, Chemical Engineering submitted a project titled "In vitro characterization of clay nanotube formulation for dermatological applications" under the guidance of **Dr. Nalinkanth V. Ghone**, **Associate Professor/Chemical Engineering**, Budget Rs.53,200/-
- Giridaran S, Bathrasri Kannan KT, and Roshan of III YEAR, Chemical Engineering submitted a project titled "Synthesis of dimethyl carbonate from sequestered CO2 in clay nanotubes" under the guidance of **Dr. Nalinkanth V. Ghone/Chemical Engineering**, Budget Rs.30,969/-
- Krishnapriyaa M M, K V Malavika, Vaibavasri S of III year CHEM submitted a project titled "Synthesis and Characterisation of Nano scale Zero-Valent Iron Supported on UiO-66 (Zr-MOF) for the removal of Heavy Metals" under the guidance of **Dr. D. Gnana Prakash, Associate Professor/Chemical Engineering.** Budget Rs.24,938/-
- Gokul Kannan R, Dinesh Kumar, Smilin Blessy C of II-year Chemical Engineering submitted a project titled "Wind Energy Harvesting by Piezoelectric Plate" under the guidance of **Dr. Anup Kundu**, **Assistant Professo/Chemical Engineering r** Budget Rs.25000/-
- Ajay Chinnathambi M P, Pratheesh T, and Jeyanth J of II-year Chemical Engineering submitted a project titled "Sustainable Solutions: Developing a Bio Dishwashing Liquid" under the guidance of **Dr. Anup Kundu, Assistant Professor/Chemical Engineering & Dr. V. Jaikumar, Associate Professor/Chemical Engineering** Budget Rs.25000/-

Patents

- **Dr. R. Anantharaj Ph.D**, **Associate Professor,** submitted the verified first draft of the complete specification for the invention titled "Hydrophobic Deep Eutectic Solvents on Selective Removal of Cadmium Ion from their Aqueous solution." to CIntelligence Services Pvt Ltd on 31.08.2023.
- **Dr. R. Anantharaj Ph.D**, **Associate Professor** submitted the verified first draft of the complete specification for the invention titled "Extraction of Hexavalent Chromium Using Hydrophobic Deep Eutectic Solvents and Its Re-Utilization Performances." to CIntelligence Services Pvt Ltd on 31.08.2023

Events Attended

- **Dr. Balaji Dhandapani, Associate Professor** presented a paper entitled 'A potent insight into the microalgal and surface-modified magnetic microalgal biomass synthesis and treatment strategies in the removal of metal ions' in 3rd International Conference on "Waste, Energy and Environment (ICWEE-2023)", organized by Centre for Waste Management, Sathyabama Institute of Science and Technology, Chennai, during July 5-7, 2023.
- **Dr. Nalinkanth V. Ghone**, Associate Professor has attended one day national level workshop on "Goals and Strategies for NAAC Accreditation" organized by SSNCE on 13.07.2023.
- **Dr. B. Ambedkar**, Mangaleswari Santhosh kumar presented a paper along with Ambedkar Balraj, Geetha Subramani, and Ambiga Selvaraj, High Frequency Ultrasound-Assisted CO2 Stripping/ Solvent Regeneration: Process Intensification by Al2O3 Nanoparticles", International Conference on Sustainable and Applied Nanotechnology for Agriculture and Heath (SANTAH) organized by IIT Madras from 19" - 21" July 2023., Chennai, Tamilnadu, India.
- **Dr. R.Anantharaj, Associate Professor** has attended One day Training cum Interactive Programme on "Research Options in Sustainability of Ground Water" organized by Central Ground Water Board & Centre for Research - Anna University on 24.08.2023.
- **Dr. Anup Kundu, Assistant Professor**, attended Five days Faculty Development Programme (FDP) on "AI & Gamification for Teachers" Conducted by SSN School of Management, SSN College Engineering, Kalavakkam, Tamil Nadu from 21.08.2023-25.08.2023.

Viva-voce & DC meetings

- **Dr. R.Anantharaj, ASP/Chem** conducted the Synopsis DC Meeting for his full-time research scholar, Ms. M.T.Beevi Fathima on 27.07.2023.
- **Dr. D. Balaji, ASP/Chem** conducted the public viva-voce for his full-time research scholar, Ms. Dhanya V on 02.08.2023.
- **Dr. R.Anantharaj, ASP/Chem** conducted the Synopsis DC Meeting for his full-time research scholar, Mr.Kadambanathan K (Reg. No. 21145991111) on 21/08/2023.
- **Dr. P. Senthil Kumar Professor/Chemical Engineering** conducted the confirmation DC Meeting for his full-time research scholar, Mr. S. Denisdon on 25.08.2023.

- **Dr. P. Senthil Kumar Professor/Chemical Engineering** conducted the confirmation DC Meeting for his full-time research scholar, Mrs. G. Pooja on 25.08.2023.
- **Dr. P. Senthil Kumar Professor/Chemical Engineering** conducted the confirmation DC Meeting for his full-time research scholar, Mr. G. Bharath Balji on 25.08.2023.
- **Dr. P. Senthil Kumar Professor/Chemical Engineering** conducted the first DC Meeting for his full-time research scholar, Mrs. P. Ajitha on 25.08.2023.
- **Dr V Jaikumar** Conducted First DC Meeting of Newly joined Full Time Research Scholar Mrs Pooja on 30 Aug 2023. DC Members are Dr Saravanathamizhan Prof. Anna University and Dr Sivasubramanian Prof. NIT Calicut.
- **Dr. D. Balaji, ASP/Chem** conducted the public viva-voce for his full-time research scholar, Mr. Santhosh K on 21.09.2023.

Industrial Interacations

With reference from Mr.T.S.Giridaran, CEO SSN iFound, I along with Dr. R. Ananatharaj visited Plant Lipids, Khamman, one of largest producers of spice extracts, essential oils and natural colours on 28th September 2023.

We went around the plant and had discussion with their experts about the process. They use Red chilli grown in nearby areas and extract novel compounds using various solvents. After the process the sludge obtained has been used by various industries. But due to their high moisture content its usable is questioned now. Hence we have been asked to reduce their moisture content in the sludge which is the primary task.

Secondly for extraction of capsaicin from Red chilli they have tried with various solvents. However, these solvents are volatile and creates further moisture and therefore an alternate green and sustainable solvents are essential to meet the best extraction efficiency.

They have agreed to collaborate with us, and are ready to supply their sludge samples. With the preliminary study completed here we will share the result with them to go up further. In fact, they have sent a mail communication regarding the same and will receive their samples shortly.

- Report by Dr. K. Sathish Kumar, Head-Chemical Engineering

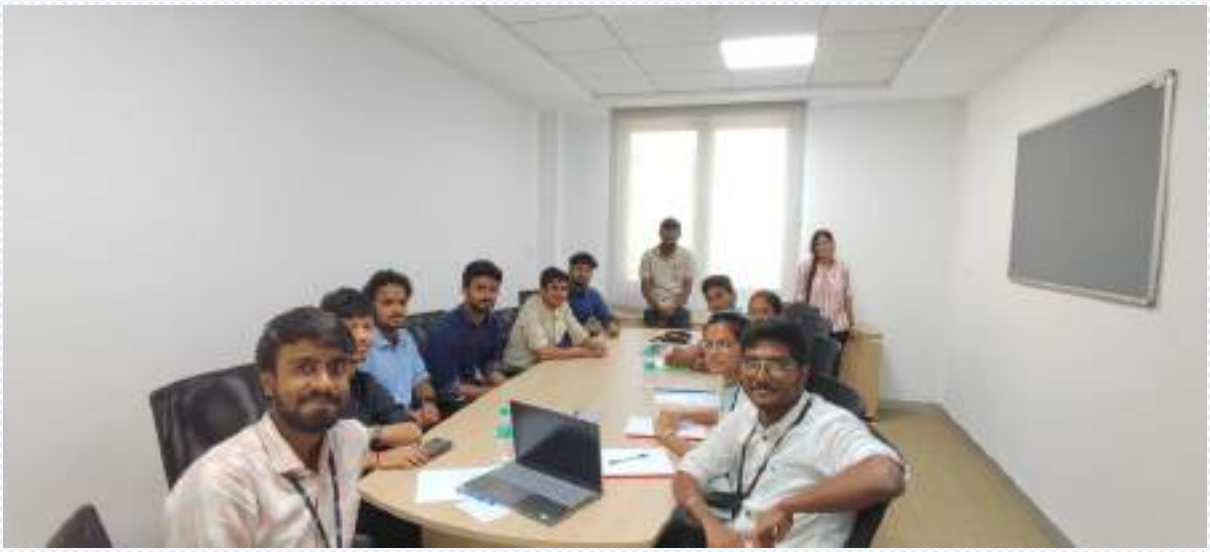
ALUMNI ACTIVITIES

Alumni Interaction with the Department

Alumni Association of Chemical Engineering Department organized an engaging and insightful interactive session for the current final year students, focusing on placement preparation on 12th August 2023. The event brought together a diverse group of accomplished alumni, Mr. S. Nijanthan (2016 Batch) Senior Process Engineer, Mr. G. Sudarshan (2019 Batch) Senior Process Engineer and Miss. G. Lavanaya (2021 Batch), Process Safety Engineer at Technip Energies. During this dynamic session, students gain valuable insights into the intricacies of job searching, interview techniques and industry specific advice. The interactive nature of session not only empowered the students with practical career skills but also fostered a sense of connection and community within the alumni network.

CAREER DEVELOPMENT WORKSHOP

SSN Alumni Association conducted the career development workshop on 9th, September, 2023. In the event, Chemical Department students were allowed to choose between core company technical interviews, IT company technical interviews, management company interviews, group discussion rounds and general HR



interviews. For the technical round, Mr. M. Danish John Paul (2015 – 2019 Batch), Process Engineers from McDermott has conducted a mock interview. After the individual interviews, overall feedback was given to all the students which was really beneficial to them. A session for group discussion was conducted by Miss. Shruthi Nagaraj (2015 – 2019 Batch), Product Marketing Specialist, Freshworks. Importance of the group discussion was informed to the students during discussion round. After GD she gave individual feedback to each student. Students interacted with the alumni and the session served as a valuable learning experience. The chemical core interview was highly beneficial as it provided valuable experience to students who previously did not have the opportunity to participate in core interviews. It was a great learning experience for the students in attending the mock interviews conducted by alumni from various industries including human resource, management, core technical and software.

Alumni Interaction

Ms. Yamini Balaji (2023 Batch), Graduate Engineering Trainee – Proposal and Estimation Department, L&T Energy Hydrocarbon, interacted with the current final year chemical engineering students on 16th September 28, 2023. The discussion focusses on current industry challenges, emerging technologies, interview preparation and career prospects. This engagement not only facilitates knowledge exchange but also helps the students to gain a deeper understanding of real-world applications in their field of study.

STUDENT ACTIVITIES

Placements

PLACEMENT DETAILS - BATCH - 2019 - 2023				
Sl.No.	**Name**	**Company**	**Category**	**Salary per Annum (Rs)**
1.	Aadithya S	Wood	Core	6.00
2.	Ambiga S	Technip Energies	Core	6.00
3.	Ashwin Kumaar B	Zifo RnD	Core	4.76
4.	Chaitanya Polavarapu	Zifo RnD	Core	4.76
5.	Dhriaviya Devi M	Wood	Core	6.00
6.	G D B Santhosh	Wood	Core	6.00
7.	Geetha S	Zifo RnD	Core	4.76
8.	Geofrin Lanso L S	Zifo RnD	Core	4.76
9.	Hemanthram R S	Zifo RnD	Core	4.76
10.	Jalashree S	Wood	Core	6.00
11.	J P Michael Samuel	L&T Technology Services	Core	4.00
12.	Meenakshisundaram R M	Zifo RnD	Core	4.76
13.	Mohan P	Wood	Core	6.00
14.	K Poornima	Wood	Core	6.00
15.	R Priyavadhana	McDermott	Core	6.00
16.	Janarth R	Technip Energies	Core	6.00
17.	Sathi Sai Akshatha	Worley India Pvt. Ltd.	Core	5.15
18.	Sri Varshini	McDermott	Core	6.00
19.	Tharun Kumar R	Zifo RnD	Core	4.76
20.	Umayaa N	Technip Energies	Core	6.00
21.	Vaideesh Srinivasan	Zifo RnD	Core	4.76
22.	B. Vaishnavi	Wood	Core	6.00
23.	Varshni Murugan	KBR Engineering	Core	6.00
24.	Vevaka Nandha J O	Worley India Pvt. Ltd.	Core	5.15
25.	Vidya S	Worley India Pvt. Ltd.	Core	5.15
26.	Viknesh S	Wood	Core	6.00

Co & Extra Curricular Activities

- **Dr. B. Ambedkar, Associate Professor**, Research Scholar "Mangaleswari Santhosh kumar" presented a paper along with Ambedkar Balraj, Geetha Subramani, and Ambiga Selvaraj, High Frequency Ultrasound-Assisted CO2 Stripping/ Solvent Regeneration: Process Intensification by Al2O3 Nanoparticles", International Conference on Sustainable and Applied Nanotechnology for Agriculture and Heath (SANTAH) organized by IIT Madras from 19" - 21" July 2023., Chennai, Tamilnadu, India.
- **Dr. B. Ambedkar, Associate Professor**, Research Scholar "Mangaleswari Santhosh kumar" presented a paper along with Ambedkar Balraj, Moniha Mohanavelu and Geetha Subramani "Enhancement of Megasonics-Assisted CO2 Stripping Using Hydrophobic Nano-Particles", Internal National conference on Emerging Technologies in Engineering and Science (ICETES), August 11-12, 2023, DVR & Dr. HS MIC College of Technology, Kanchikacherla, Andhra Pradesh, India.
- **Dr. B. Ambedkar, Associate Professor**, Research Scholar "Papitha Palaian Premalalitha" presented a paper along with Ambedkar Balraj, Nilavuckkarasi R Karunakaran and Ambiga Selvaraj, "Regeneration of Carbon-Rich Aminosilicone-Triethylene Glycol Mixture Using Megasonics", 1st International Conference on Emerging Technologies in Engineering and Science (ICETES), August 11 – 12, 2023 at DVR & Dr. HS MIC College of Technology (AUTONOMOUS), Kanchikacherla, Andhra Pradesh, India.
- Third year UG students of the department of chemical engineering along with the faculty **Dr. V. Jaikumar, Associate Professor**, Chemical Engineering, and **Dr. Balaji D, Associate Professor**, Chemical Engineering visited Sewage Treatment Plant at Nesapakkam and Koyambedu in Chennai on 04-09-2023. The Industrial Visit was arranged by Dr. Parthiban, Professor, Chemical Engineering.

Talent Showcase

The Transformative Power of Cloud Computing

Cloud computing has emerged as a revolutionary technology, transforming the way businesses operate and individuals access and store data. With its scalable infrastructure, flexibility, and cost-effective solutions, cloud computing has become a game-changer in the digital era.

Cloud computing has unlocked new possibilities by providing ubiquitous access to resources and services over the internet. Gone are the days of relying solely on local servers and hardware. Organizations can now leverage the power of the cloud to store, process, and analyze vast amounts of data, enabling them to make informed decisions and drive innovation. The cloud has facilitated collaborative work environments, allowing teams to seamlessly share and collaborate on projects from any location, enhancing productivity and efficiency.

One of the key advantages of cloud computing is its scalability. Businesses can effortlessly scale their resources up or down based on demand, eliminating the need for expensive investments in on-premises infrastructure. Moreover, cloud computing offers unparalleled flexibility, empowering organizations to adopt agile practices and quickly respond to market changes. This agility enables businesses to launch new products or services swiftly, gaining a competitive edge in the fast-paced digital landscape.

Cloud computing has disrupted the traditional IT cost structure. Organizations no longer bear the burden of maintaining and upgrading physical servers, reducing capital expenditure. By embracing cloud solutions, businesses can leverage a pay-as-you-go model, paying only for the resources they utilize. This cost-effective approach allows organizations of all sizes to access enterprise-level infrastructure and services without the need for significant upfront investments.

Cloud service providers prioritize robust security measures to protect sensitive data, often employing encryption, access controls, and continuous monitoring. Additionally, they invest heavily in redundant infrastructure, ensuring high availability and minimizing the risk of data loss. Cloud-based disaster recovery solutions offer peace of mind, providing organizations with reliable backup and restoration capabilities.

In conclusion, cloud computing has revolutionized the digital landscape, offering scalability, flexibility, cost-effectiveness, and enhanced security. Its transformative impact has enabled businesses to innovate and thrive in a rapidly evolving digital era, making it an indispensable technology for organizations across all sectors.

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

The Uselessness of Engineering Graphics: An Unproductive Subject

Engineering Graphics, often touted as a cornerstone of engineering education, is a subject that has perplexed students and left them questioning its relevance in today's technological age. With the rapid advancements in computer-aided design (CAD) software and the diminishing importance of manual drafting, it's time to address the elephant in the room: Engineering Graphics is a largely useless subject in the modern engineering curriculum.

1. Obsolete Skills: Engineering Graphics primarily focuses on manual drafting techniques, which were once crucial but have now become archaic in the face of digital technology. The painstaking hours spent on learning how to draw precise lines, projections, and isometric views with pencil and paper are skills that are almost never put to practical use in today's engineering world. Modern engineers rely on CAD software to create complex designs efficiently, rendering these archaic skills redundant.

2. Wasted Time and Resources: The countless hours students dedicate to mastering the art of manual drafting could be better spent on subjects that are genuinely pertinent to modern engineering practices. The time spent laboring over T-squares and drafting tables could be channeled into subjects like robotics, artificial intelligence, or materials science, all of which are integral to the future of engineering.

3. Limited Industry Demand: In today's competitive job market, engineers are hired for their ability to apply digital design tools effectively. Employers seek engineers who can produce 3D models, simulations, and prototypes using CAD software. Rarely do employers require proficiency in hand-drawn sketches or orthographic projections, rendering the skills learned in Engineering Graphics almost irrelevant.

4. Environmental Impact: The resources required for manual drafting, including paper, ink, and drawing instruments, have an adverse environmental impact. In an era where sustainability is a pressing concern, it is irresponsible to continue teaching skills that encourage excessive use of paper and contribute to deforestation.

5. Inadequate Preparation: Engineering Graphics does a disservice to students by inadequately preparing them for the realities of the engineering profession. Modern engineering projects are collaborative endeavors that rely heavily on digital tools for design, analysis, and documentation. Spending excessive time on a subject that does not align with the industry's needs sets students up for failure rather than success.

6. Stifling Creativity: The rigid rules and standards of Engineering Graphics can stifle creativity in engineering design. By placing undue emphasis on conformity to traditional drafting standards, this subject limits the imaginative thinking that is essential for innovation in engineering.

In conclusion, Engineering Graphics is an outdated subject that does not serve the needs of today's engineering profession. It wastes valuable time and resources, provides obsolete skills, and fails to adequately prepare students for the demands of the modern engineering industry. It's time for educational institutions to reconsider the relevance of this subject in their curricula and prioritize subjects that equip students with the skills and knowledge needed to thrive in the 21st-century engineering landscape.

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

WAKING UPTO A CLIMATE CHANGE.....

Global warming is a common word in the present; gen-z as this is the generation which has seen. The word which means it's the long-term heating of Earth's surface observed since the pre-industrial period cause to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere.

The term can be used or can be so-called "interchanging climate".

In the present year, the planet is in distress, the grip is tight of warming globe caused an unrest for the world. The temperature, spiked up, nature's harmony disrupted. It’s required to stand up as a solution for it

What is global warming...? We go in it for brief now. Global warming is an upraised issue and problem in the recent time it reached critical level in the present year (2023).

The consequences of this environmental crisis are becoming increasingly evident as temperatures soar, ice belt melt, and extreme weather events become more frequent and vast pain. The accelerated pace of global warming is primarily attributed to human activities, particularly the burning of fossil fuels and deforestation.

The release of greenhouse gases, such as carbon dioxide and methane, into the atmosphere is a significant contributor to global warming. These gases trap heat, leading to the unfavorable greenhouse effect that drives up temperatures worldwide. As a result, we witness the rapid melting of glaciers and polar ice belt leading to rising sea levels and the submergence of coastal regions.

Island nations and vulnerable coastal communities are already grappling with the imminent threat of displacement and loss of their homes.

The global warming has been a headache in the agricultural fields as well cause due to sudden change, agriculturist don't know which plant how they would grow and fertility of soil also degrades by it the changing climate leads insecurity for humans' food and threatens global food systems. Furthermore, global warming amplifies the intensity and frequency of extreme weather events, including hurricanes, droughts, and heatwaves. These events wreak havoc on communities, causing devastating economic and human losses. Ecosystems are also suffering, as species struggle to adapt to rapidly changing environments, potentially leading to biodiversity loss and ecological imbalance.

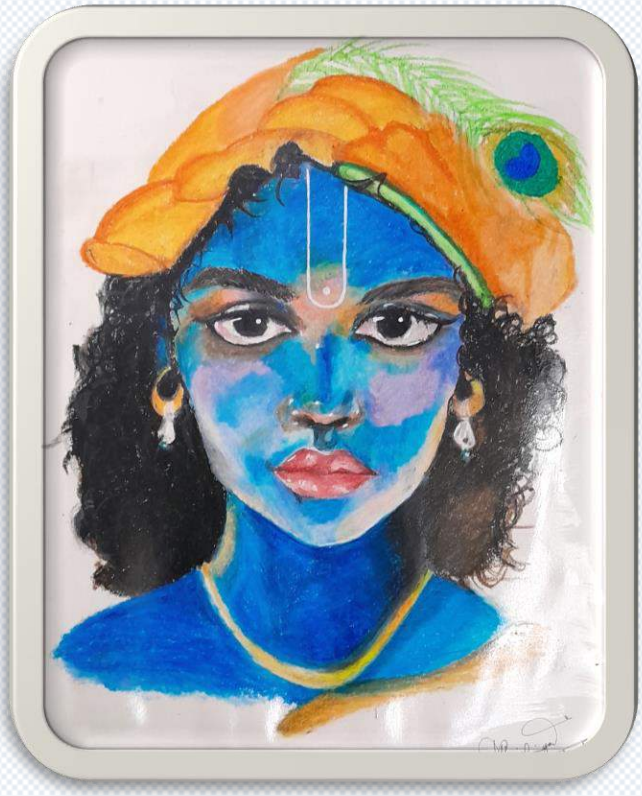
The only possible positive thing that happened during the lockdown time was that the ozone depletion was recovered, that in a way has stabiles the eco system as it helps in one or other way. Many ways are there where the globe can be conserved and the warming effect can be reduced and helpful for the best.one of the best ways preferable would-be educational awareness as its the duty of the young generation to save the globe. It's right that civilization should reach at its top and it should be advanced but damaging the resource giving planet would be trounce on the Earth.

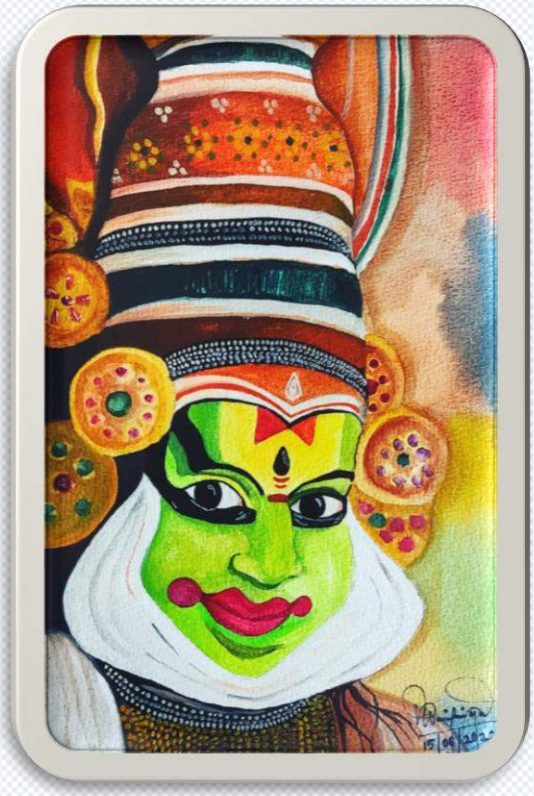
The young generation, kids, elders should take responsible of questioning the government and find ways for helping them restore our won planet and overcome global warming effect.

Effective methods for preventing global warming would be:1) Save energy at home, 2) Walk, cycle, or take public transport, 3) Reduce, reuse, repair & recycle,4) Change your home's source of energy, 5) Switch to an electric vehicle. These given are some out of many but it's the duty of public to secure it and make action over it.

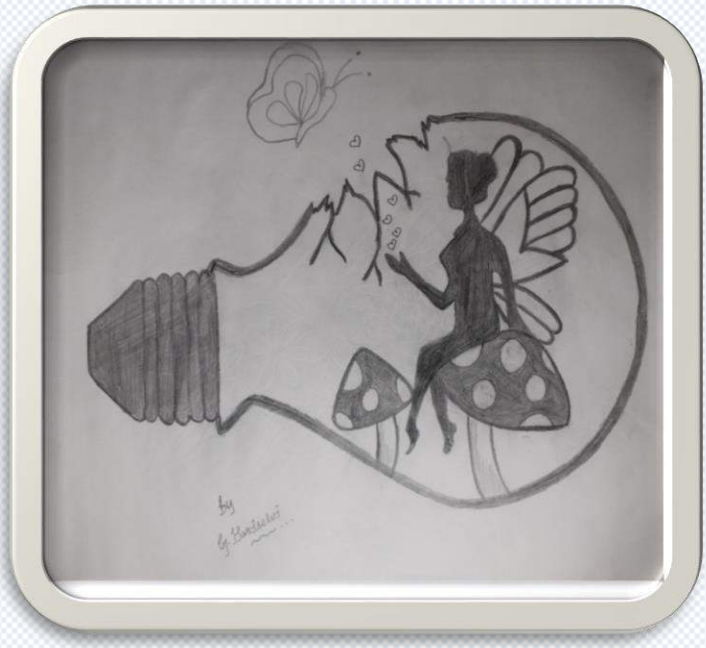
In conclusion, Global warming was a problem, is a problem but should be not a problem to the future, as this climate change is the most significant problem facing the world. Global warming is increasing day by day. If we cannot prevent it as soon as possible, our world will face undesirable consequences and prevention should be in comandante. The end could be: "global warming isn't a prediction; it's happening", "Want a future? Save mother earth". People living should always remember these two quotes to have future to live in.

- Article by Mr. Dwithin, II Year B.Tech., -Chemical Engineering





- Art by Ms. V. Haripriya, II Year B.Tech., -Chemical Engineering



- Art by Ms. G. Hari Selvi, II Year B.Tech., -Chemical Engineering

பொறாமை கொள்ள வேண்டாம்
கொஞ்சம் பொறுமை கொண்டால் போதும்
சினம் கொள்ள வேண்டாம்
சற்று சிந்தித்து செயல்பட்டால் போதும்
வண்மம் நமக்கு வேண்டாம்
வண்ணமிகு வாழ்க்கையே போதும்
புலம்பிக் கொட்ட வேண்டாம்
புன்னகைத்துக் கொண்டால் போதும்
பிரிந்து வாழ வேண்டாம்
கொஞ்சம் புரிந்து நடந்தால் போதும்!

-கிருஷ்ணபிரியா, III Year B.Tech., -Chemical Engineering

EDITORIAL TEAM

FACULTY EDITORS

Dr. K. Sathish Kumar

Dr. D. Balaji

Dr. Anup Kundu

STUDENT EDITORS

S. Sanjnaa

L. M. Rajashri

P. Smruthi

S. Abinaya

Fathema Fahmida Sulaiman

M. Pranavavel

III Year B.Tech., - Chemical Engineering