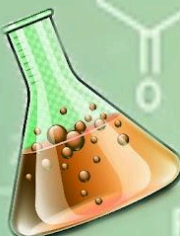
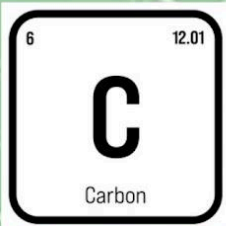


DEPARTMENT OF
CHEMICAL
ENGINEERING
NEWSLETTER

THE



CATALYST
ACCELERATING YOUR GROWTH

Volume - 3, Issue - VI, June, 2024

Newsletter: E-Copy



Newsletter

The Catalyst

(Accelerating your Growth rate)

Department of Chemical Engineering

Vision

“To attain comprehensive recognition in research and training students for developing a value based sustainable society on both National and global platforms by fostering creative minds for academic and research excellence with highly futuristic facilities and potential support.”

Mission

Empowering Excellence: Drive human excellence by shaping the future of chemical engineering through groundbreaking research and innovation.

Continuous Improvement: Foster the innovative capabilities of individuals in providing solutions for the needs of the society by acquiring necessary skills and attributes.

Lifelong Support: Enable engineers to translate ideas and discoveries into equitable engineering solutions worldwide.

Motivation: Alumni page



Ms. Anusha. G

P-GET

Fichtner Consulting Engineers

B.Tech - Chemical Engineering

(2018 - 2022)

My Dear Juniors,

Be ambitious! Work hard to achieve your ambition. Never settle for anything you deem lesser. It takes a lot of courage to not settle for anything lesser and aiming for something bigger. Yes, you should be courageous to come out of your comfort zone and work harder. Your mantra should always be "hard work" and there is no shortcut to achieve your dream. Plan everything you need to do to achieve your dream and start working on it. Don't be afraid of the end result, if there is vigor in you and you meticulously work hard, there will be success at the end of the tunnel.

Even after this, if you fail, you shouldn't be afraid of failures. Each time you fail, doesn't mean that you are a loser, each time you learn something more valuable, which is a win. This should be the mind-set. But, never give up in between, work until the last. Be optimistic and calm in all situations. Do not compare yourself with anybody, you are unique, so comparing yourself with your peers will bring you unnecessary stress. To achieve this state of mind is not an easy task, practice meditation, control your mind.

Our department faculties are gems. They are student-friendly and never judge you for what you are or what you have done, which you cannot see in any colleges. So, always seek their guidance and use the research facilities available in the department. Don't be ignorant, know what is happening in your surroundings, among your classmates, in your department. Maintain a good rapport with the faculties and be attentive in class.

Be strong with your basics, use multiple text books for it, if you struggle with any concepts, always seek your professors and friends. So, be ambitious, be brave, be vigorous, don't give up, be patient, you will be at a height where you want to be. Finally, never think you are unfit to dream anything bigger. All the best guys!

Chemical Skill Development Training: enhance *employability*

Chem Skill Development Centre (CSDC), a non-profit trust consisting of experts from Chemical industries, predominantly from Manali, is involved in providing practical knowledge to Chemical Engineering students.

The Department of Chemical Engineering, SVCE, in collaboration with CSDC, conducted a 13-day training program for final-year Chemical Engineering students from 11th – 26th June 2024.

The training consisting of 40 sessions for a total of 60 h were handled by around 25 technical experts and management consultants from industries viz., Chennai Petroleum Corporation Limited (CPCL), Tamilnadu Petroproducts Limited (TPL), Epcogen Private Limited, CETEX Petrochemicals Limited, Kothari Products Limited (KPL), Thirumalai Chemicals Limited (TCL) and MonitPro Solutions; and inaugurated by Mr. Premapriyan, VP Operations, Kothari Petrochemicals Limited & Mr. R. Ravi, Director, Chem Skill Development Centre and Prof.S.Muraleedharan, Chief Placement Officer, Sri Venkateswara College of Engineering.

The experts imparted knowledge related to the expectations from the industry, safe practices and social obligations such as process safety and Environment Social Governance (ESG). Some of the key topics covered during this training were “Operation of Chemical Plants”, “Plant Design & Safety Aspects”, “Process Design Drawing & Design Tools”, “Process Safety Management,” and “Process Simulation.”



The list of sessions covered during the training is provided in the table below, along with insights into the training aspects are given.

Date & Day	Session	Topic	Faculty
11.06.24 Tuesday	INAUGURAL SESSION Chief Guest: Mr. Premapriyan, VP Operations, Kothari Petrochemicals Limited Mr. R. Ravi, Director, Chem Skill Development Centre		
	1	Pressure Vessels & Storage Tanks Design	Mr. Sankaranarayananamurthy, Senior Associate Vice President, Coromandel International Limited, Kakinada
	2	Plant Design Engineering	Mr. Gunasekaran N., Process Plant Consultant
	3	Plant Design & Safety Aspects	Mr. Avudiappan RM., Proprietor, AV Process Consulting
12.06.24 Wednesday	4	Water Treatment	Mr. Venkat Subramanian, Technical & Business Consultant
	5	Chemical Plant Life Cycle	Mr. Stalin S., Former SPIC Executive Director
	6	Operation of Chemical Plants	Mr. Stalin S., Former SPIC Executive Director
13.06.24 Thursday	7	Optimisation & Plant Modification	Mr. Paneer Selvam B., Retired Chief General Manager, CPCL
	8	Operational Control Practices	Mr. Premkumar T.K., General Manager (Projects), Arasan Eye Hospitals, Chennai
	9	Accidents reporting & Investigation	Mr. Premkumar T.K., General Manager (Projects), Arasan Eye Hospitals, Chennai
14.06.24 Friday	10	Asset Integrity	Mr. Murthy N.S., Senior Consultant, McKinsey & Company, Chennai
	11	Net Zero	Mr. Murthy N.S., Senior Consultant, McKinsey & Company, Chennai
	12	Infrastructure. & Logistics for chemical industries	Mr. Premkumar T.K., General Manager (Projects), Arasan Eye Hospitals, Chennai

Date & Day	Session	Topic	Faculty
15.06.24 Saturday	13	Industrial Momentum Transfer Equipment	Mr. Natarajan N., Vice President - Engineering, Epcogen Private Limited, Chennai.
	14	Industrial Heat Transfer Equipment	Mr. Natarajan N., Vice President - Engineering, Epcogen Private Limited, Chennai.
	15	Process Design Drawing & Design Tools	Mr. Natarajan N., Vice President - Engineering, Epcogen Private Limited, Chennai.
18.06.24 Tuesday	16	Emergency Preparedness	Mr. Sivaram Kumar, Senior Manager – Manufacturing Excellence, Thirumalai Chemical Limited, Ranipet
	17	Case Studies and problem Solving	Mr. Sivaram Kumar, Senior Manager – Manufacturing Excellence, Thirumalai Chemical Limited, Ranipet
	18	Quality Control Lab	Mr. Premkumar T.K., General Manager (Projects), Arasan Eye Hospitals, Chennai
	19	Economic of Production	Mr. Premkumar T.K., General Manager (Projects), Arasan Eye Hospitals, Chennai
19.06.24 Wednesday	20	Ultimate protection & safe guards	Mr. Lakshminarayanan M., Senior General Manager, Steadfast Safety Solutions, Coimbatore
	21	Technical Services	Mr. Nachiappan N., Retired Chief General Manager, CPCL
	22	Spill Control and Containment	Mr. Samantham M.C., Retired Additional Director, The Directorate of Industrial Safety and Health (DISH)

Date & Day	Session	Topic	Faculty
20.06.24 Thursday	23	Environmental Regulations	Mr. Srinivasan M., Senior Consultant, Quality Business Systems, Chennai
	24	Types of Pollution and its control measures	Mr. Srinivasan M., Senior Consultant, Quality Business Systems, Chennai
	25	EIA, Permits and sustainability	Mr. Srinivasan M., Senior Consultant, Quality Business Systems, Chennai
21.06.24 Friday	26	Root Cause Analysis	Mr. Venkat Subramanian, Technical & Business Consultant
	27	Behaviour for Safety	Mr. Lakshminarayanan M., Senior General Manager, Steadfast Safety Solutions, Coimbatore
	28	HAZOP, SIL	Mr. Perumal Manoharan, Former President (Safety), Sanmar Group
22.06.24 Saturday	29	Operational Concepts and Control	Mr. Naveen Prabhu, DGM-works, Cetex Petrochemicals Limited, Chennai
	30	Industry 4.0	Mr. Premkumar T.K., General Manager (Projects), Arasan Eye Hospitals, Chennai
	31	Technology of Manufacture	Mr. Premkumar T.K., General Manager (Projects), Arasan Eye Hospitals, Chennai
24.06.24 Monday	32	Process Safety Management	Mr. Ramesh R., Director, MonitPro Solutions Private Limited, Trichy
	33	Process Monitoring & Improvement.	Mr. Ramesh R., Director, MonitPro Solutions Private Limited, Trichy
	34	TQM & 6 Sigma	Mr. Murthy N.S., Senior Consultant, McKinsey & Company, Chennai

Date & Day	Session	Topic	Faculty
25.06.24 Tuesday	35	Safety Control and Monitoring	Mr. Samantham M.C., Retired Additional Director, The Directorate of Industrial Safety and Health (DISH)
	36	Fired Heaters, Boilers	Mr. Venkat Subramanian, Technical & Business Consultant
	37	Simulation	Mr. Venkat Subramanian, Technical & Business Consultant
	38	Develop an entrepreneur in you and pursue your dreams	Mr. Balaji S.M., Proprietor, PG Equipments India Private Limited
26.06.24 Wednesday	39	College to Industry Transformation	Ms. Sunitha, Vice President (HR), Thirumalai Chemicals Limited, Ranipet
	40	Career Path and Employment avenues	Mr. Senthikumar D., Whole time Director, Tamilnadu Petroproducts Limited (TPL), Chennai
	VALEDICTORY SESSION Chief Guest: Shri. S D Gopi, Director, Cohort Engineering, Consultancy Services Pvt. Ltd., Chennai		

The session on "Water Treatment" covered the fundamental principles and methods for treating water in industrial processes, including filtration, sedimentation, and chemical treatment techniques to ensure water quality and regulatory compliance.

The talk on "Industrial Momentum Transfer Equipment" explored equipment such as pumps, fans, and compressors used to handle fluids in motion, focusing on their design, operation, and efficiency. In "Industrial Heat Transfer Equipment," the focus was on heat exchangers, condensers, and evaporators, delving into their design, selection, and applications in process industries. The "Process Design Drawing & Design Tools" session introduced the use of software tools and drafting techniques essential for creating detailed process flow diagrams, P&IDs, and other technical drawings.

"Root Cause Analysis" emphasized systematic approaches to identifying the underlying causes of process failures or deviations, using techniques like the what if analysis and fault tree diagrams. In the sessions on "Plant Design & Safety Aspects," the focus was on designing industrial plants with safety as a core consideration, covering hazard identification, risk assessment, and the integration of safety systems into the design process. The session on "Accidents Reporting & Investigation" looked into the procedures for accurately reporting workplace accidents and conducting thorough investigations to determine root causes and prevent recurrence.

The "Emergency Preparedness" session emphasized the development of effective response plans by engineers for potential emergencies, including drills and resource allocation. "Ultimate Protection & Safeguards" explored advanced safety measures and systems designed to provide last-line defense against catastrophic failures. "Behavior for Safety" addressed the human factors influencing safety culture, promoting safe practices through behavior-based safety programs. An important session on "HAZOP, SIL" delved into Hazard and Operability Studies (HAZOP) and Safety Integrity Level (SIL) assessments, focusing on systematic approaches to identifying and mitigating risks in process industries.

The "Fired Heaters, Boilers" session covered the operation, maintenance, and design considerations of combustion equipment used for process heating, highlighting safety and efficiency aspects. The talk on "Simulation" focused on the use of process simulation software to model, analyze, and optimize industrial processes, aiding in design and operational decisions. The last day sessions were non-technical in nature. The session on "Develop an Entrepreneur in You and Pursue Your Dreams" inspires participants to explore their entrepreneurial potential, focusing on the mindset, skills, and strategies needed to start and grow a successful business.

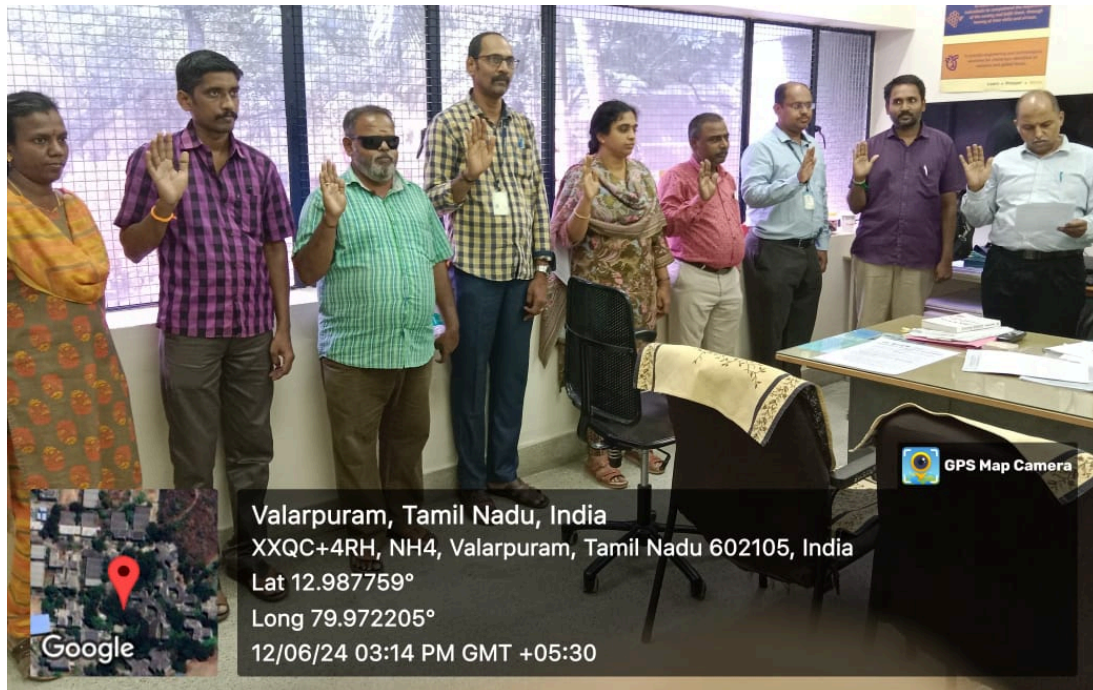
"College to Industry Transformation" addressed the crucial transition from academic life to the professional world, providing insights into the skills, communication, attitudes, and experiences that help students adapt to industry expectations. The "Career Path and Employment Avenues" session guided the students in exploring various career options and making informed decisions about their professional journeys. The session detailed about the higher studies options in India & Abroad. Further, the various avenues for a Chemical Engineering in industry and research were discussed in detail giving the students a clearer picture on their option post-graduation.

Finally Shri. S D Gopi, Director, COHORT ENGINEERING, CONSULTANCY SERVICES PVT. LTD., CHENNAI has delivered the valedictory speech emphasized the importance of industry oriented knowledge, that every graduand should possess in order to make a bright career.



A Day to pledge:

Department of Chemical Engineering , Sri Venkateswara College of Engineering, Sriperumbudur, has pledged to promote the well-being and rights of children on the account of International Children's Day.



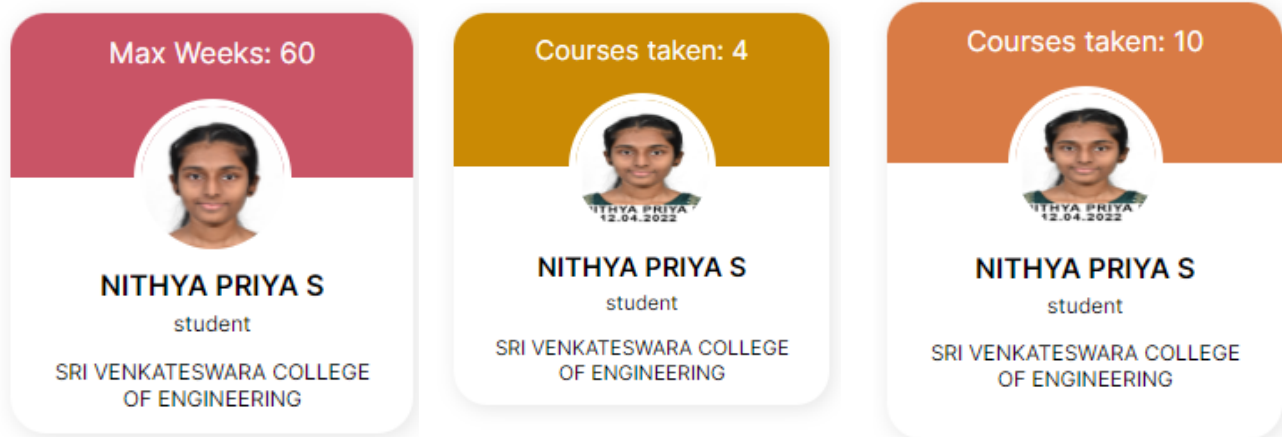
Students Achievements: *recorded appreciation*

mukundan
janarthan c
ramanamoorthy
didar s hameed
kcp limited
technip
jana rajesh

The Final year students has achieved the paid internship opportunities at KCP Limited and Technip EPC during their summer break and decorated the "Hall of Name"

Students Achievements: *recorded appreciation*

Ms.S. Nithya priya from Chemical Engineering has been recognized as a NPTEL discipline star for taking a maximum of 60 weeks of courses for the July–December 2023 examinations. (Link: <https://nptel.ac.in/nptelstars/disciplinestars>).



Ms.S.Nithya priya from Chemical Engineering has been recognized as a NPTEL motivated learner for the academic year January–April 2024 for completing 10 courses in the last four semesters. (Link: <https://nptel.ac.in/nptelstars/motivatedlearners>)

Ms.S.Nithya priya from Chemical Engineering has been recognized as a NPTEL Believers for completing 4 courses in NPTEL during January–April 2024 examinations (<https://nptel.ac.in/nptelstars/believers>)

Faculty Journal Publication: *appreciation*

Dr. N.P. Kavitha, Assistant Professor has recorded her publication in “ Journal of Water Chemistry and Technology”, Volume 26, June 2024.

*ISSN 1063-455X, Journal of Water Chemistry and Technology, 2024, Vol. 46, No. 3, pp. 279–291. © Allerton Press, Inc., 2024.
Ukrainian Text © The Author(s), 2024, published in Khimiya i Tekhnologiya Vody, 2024, Vol. 46, No. 3, pp. 338–354.*

===== WATER TREATMENT AND DEMINERALIZATION TECHNOLOGY =====

Mathematical Modelling and Response Surface Methodology Approach of Electrocoagulation Hybrid Activated Sludge Process for an Efficient Removal of Selenium from Mining Wastewater

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Abstract—Selenium (Se) is an important nutritional element which exists at very low concentrations, easily accumulates via the food chain and creates adverse effects such as a deprived reproduction rate and diminutive growth in human and aquatic organisms. So, it has become a severe concern around the world. We explore electrocoagulation using Al and Fe electrodes and activated sludge process (ASP) in batch process and also in an integrated process to remove Se. The optimized parameters of the current density in the batch process were: 6.7 and 5.7 mA/cm² for Al and Fe, respectively. The mass transfer coefficient has been estimated through numerical modelling for batch and integrated processes using the equations $K = 0.0146C_{Se}^{0.3651}I^{0.8916}$ and $K = 295.387C_{Se}^{-6.607}I^{3.587}$; the energy consumption and metal dissolution were 138240 and 384 MWh/m³, 60 and 3.58 g, respectively. The response surface methodology (RSM) was implemented in Box–Benken design to assess the parametric optimization, and the validation of experimental data was done using ANOVA and regression analysis. The obtained *p*-values and model *F*-values were 0.000 and 63.09 for Al and 0.000 and 79.98 for Fe, which indicated the significance of the model. The chemical oxygen demand (COD) reduction values estimated along with Se reduction in real effluent treatment were above 90 and 60% in electrolytic and 80% in an integrated ASP with very high-cost efficiency. The results assure that this proposed hybrid work will provide a higher reduction, improved energy and cost efficiency for the effluent with indeterminate influent Se and COD concentration. The proposed model also helps to make predictions of removal efficiency without requiring an extensive time and cost burden.

Programmes run by the Department of Chemical Engineering are,

- B.Tech Chemical Engineering
- M.Tech Chemical Engineering
- Ph.D

B.Tech CHEMICAL Engineering

Programme Educational Objectives

PEO1: Equip students with the necessary skills and knowledge to prosper in their career in Chemical Engineering and related domains.

PEO2: Encourage students to Pursue advanced learning and engage in research with internationally acclaimed institutions and foster professional growth.

PEO3: Empower students with leadership qualities to succeed in diversified fields with ethical administrative acumen and adapt to the rapid technological advancements and innovations.

Programme Outcomes

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs

with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

P04: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

P05: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

P06: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

P07: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

P08: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

P09: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

P10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

P11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOME's

PS01: Apply the knowledge of science and mathematics in the field of various transport processes to accomplish the contemporary needs of chemical and allied industries.

PS02: Execute the chemical engineering principles and modern engineering tools to conduct experiments or design a system for developing quality chemical processes by considering the cost, safety and environmental aspects.

M.Tech CHEMICAL Engineering

Programme Educational Objectives

PEO1: Function effectively to solve complex industrial problems using Chemical engineering concepts and also in expanding areas of Energy and Environmental industries

PEO2: Pursue their careers in Research and Development towards an advanced degree in Chemical engineering and allied technical discipline.

PEO3: To become Professional Leaders in the complex work environment.

Programme Outcomes

PO1: Independently carry out research /investigation and development work to solve practical problems.

PO2: Write and present a substantial technical report/document.

PO3: Demonstrate a degree of proficiency over the area as per the specialization of the program. The proficiency should be at a level higher than the requirements in the appropriate bachelor program

PO4: Potential to analyze solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.

PO5: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO6: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PROGRAMME SPECIFIC OUTCOME's

PSO1: Apply the knowledge of science and mathematics in the field of various transport processes to accomplish the contemporary needs of chemical and allied industries.

PSO2: Usage of modern engineering tools to design and conduct experiments to develop quality chemical processes by considering the cost, safety and environmental aspects.

Editorial Team: Dr. N. Meyyappan, HOD/CHE & Mr. S. Jai Ganesh, AP/CHE.