SRM INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

CHEMICAL CHRONICLE

NEWSLETTER

Volume 2, Issue 1 (July to December 2022)

Department of Chemical Engineering
College of Engineering and Technology
SRM Institute of Science and Technology

Kattankulathur - 603 203, Chengalpattu District
Tamil Nadu, India

NAAC	MHRD Govt. of India / UGC University Grants Commission	nirf National Institutional Ranking Framework	QS	THE World University Rankings	ARIIA Atal Ranking of Institutions on Innovation Achievements	SHANGHAI RANKING
A++	Category 1 with 12B Status	(2022) Ranked 19th University	(2023) World Ranking one among 41 Indian Universities	(2023) World Ranking one among 75 Indian Universities	(2021) Ranked 4th	(2023) World Ranking one among 14 Indian Universities

https://www.srmist.edu.in/department/department-of-chemical-engineering/
Facebook: https://www.facebook.com/profile.php?id=100083228537110
Instagram: https://instagram.com/srmchemicalofficial?igshid=ZDdkNTZiNTM=

Message from the Chairperson
School of Bioengineering

Dr. M. Vairamani
Chairperson, School of Bioengineering, CET, SRMIST

I congratulate the Department of Chemical Engineering, SRM Institute of Science and Technology for putting together the second volume of the newsletter, 'Chemical Chronicle'. This issue focuses on the various activities and accomplishments of the students and faculty of the Department of Chemical Engineering during the period from July to December 2022. A periodic consolidation of milestones achieved by the department helps motivate the team spirit and also indicates the areas of refinement and growth to be planned in future. Since both academia and research elucidate a need for traversing across departments to cultivate a multidisciplinary attitude, I am sure that this newsletter will pave way for many such collaborations.

I congratulate the editorial team for coming up with another enticing issue of the Chemical Chronicle and hope to witness the continual growth of the department through this medium.

From the HoD's Desk

Dr. K. Suresh
Head of the Department, Chemical Engineering

Dear Reader,

Greetings!

I am delighted to present the second volume of 'Chemical Chronicle', the official newsletter of the Department of Chemical Engineering, College of Engineering and Technology, SRMIST. This newsletter brings to you the highlights of the department activities such as research contributions, awards/ prizes won, conferences, workshops, technical talks organized, and the recent placement records of our students.

I wholeheartedly thank the students, parents, alumni, research scholars, faculty, and the non-teaching staff of the Department of Chemical Engineering, for being a part of this incredible journey and solicit your support in all our future endeavours to carry the department to a higher pedestal. I am thankful to the management for providing a conducive environment to synergise our strengths towards fulfilling the objectives of the department and the institute as a whole. I am sure this compilation consisting of our efforts will help to periodically review, retrospect and plan to improve our performance in a better manner.

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Phone: 044 – 2741 7818

Editorial Desk

Dear Readers,

We are overwhelmed to present to you the second volume of the Chemical Chronicle. This issue serves to showcase all the aspects of growth of the department observed over a period of six months from July to December 2022. The students, faculty, and supporting staff have always put in their best efforts for the growth of the department and this period is no exception. ***We are proud to let you know that all the faculty in the Department of Chemical Engineering have published research articles in the past semester (January to June 2022).*** *The quality of the research publications has increased significantly as reflected by the increase in* ***average impact factor*** *of the publications from* ***3.9 to 6.7*** *in the last 6 months. In the phase I of the placement season for final year B. Tech. (2019-2023), the students have bagged* ***30 job offers*** *already and we are sure that the number will increase tremendously in the forthcoming semester before they pass out.*

In an attempt to showcase the research activities of the Ph.D. scholars and to promote an interactive research environment, the department has introduced the ***Research Seminar series*** *where in the scholars and the faculty members give a talk on a research topic followed by a discussion. The feedback has been a very positive one and we are hoping to continue the same in future as well.*

The creativity of the faculty members and students is portrayed in the new ***Creative corner*** *section featuring articles and puzzles contributed by them. Hope you have a wonderful time reading our newsletter!*

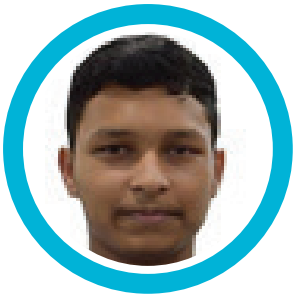
Warm regards,

Editorial Team

Dr. E. Poonguzhali
Assistant Professor
Chemical Engineering

Dr. K. Deepa
Assistant Professor
Chemical Engineering

Student Contributors



Sarthak Asthana
IV year,
B. Tech. Chemical Engineering

Afeez Ahamed A.
IV year,
B. Tech. Chemical Engineering

Praveena M.
II year,
B. Tech. Chemical Engineering

About the Department

The Department of Chemical Engineering was started in the year 1995 offering B. Tech. degree programme in Chemical Engineering as one of the core departments of SRM Engineering College under the University of Madras. The department started offering a post-graduate programme, M. Tech. (Chemical Engineering) since 2002-2003. From the academic year 2003-2004, the department started functioning under SRM Institute of Science and Technology. The department now offers B. Tech. (Chemical Engineering), M. Tech. (Chemical Engineering) and Ph.D. (part time and full time) under SRM Institute of Science and Technology. So far, 24 batches of B. Tech. students and 19 batches of M. Tech. students have graduated from this department with meritorious performance. Presently, the department has 15+ Ph.D. scholars working on various socially relevant projects.

Vision of the Department

To utilize Chemical Engineering and Technology to ensure overall socio-economic growth, welfare, and progress of Indian society and the World-at-large by supporting Academia, Industries through Research and Development, Consultancy and graduating high-quality Chemical Engineers

Mission of the Department

- **To facilitate high quality education, well grounded in the fundamental and applied areas of engineering necessary for learners to contribute effectively to chemical and allied industries**
- **To educate, prepare, inspire and mentor learners with the technical and professional skill-set necessary to excel as professionals, grow in their careers and contribute to chemical engineering science and technology**
- **To inculcate social-responsibility in learners and train them to contribute effectively to science and society**

Publications

The **faculty members** along with their **students** have published **13 papers** in refereed journals and **2 book chapters** during the period, July to December 2022. The Department of Chemical Engineering congratulates its faculty members and students for their tremendous efforts towards contribution for publication in peer reviewed journals/books.

Number of Publications (July to December 2022)	**13**
Number of Corresponding Author Publications	**11 (85 %)**
Number of Science Citation Indexed (SCI) Publications	**11 (85 %)**
Highest Impact Factor	**11.072**
Average Impact Factor	**6.664**

Dr. Paromita Chakraborty
Publication with highest IF: 11.072

[1] **K. Deepa*, Adithya Sridhar,** T. Panda, **"Biogenic Gold Nanoparticles: Current Applications and Future Prospects", Journal of Cluster Science.** (2022). https://doi.org/10.1007/s10876-022-02304-8. **(SCI, IF : 3.447).**

[2] **Meenu Mariam Jacob, P. Muthamilselvi*, Ashish Kapoor, S. Prabhakar, "Adsorptive decontamination of organophosphate pesticide chlorpyrifos from aqueous systems using bagasse-derived biochar alginate beads: Thermodynamic, equilibrium, and kinetic studies", Chemical Engineering Research and Design.** 186 (2022) 241–251. https://doi.org/10.1016/J.CHERD.2022.07.043. **(SCI, IF : 4.119).**

[3] **M. Ogedjo, Ashish Kapoor, P. Senthil Kumar, G. Rangasamy, P. Muthamilselvi, M. Rajagopal, P. Nath Banerjee, "Modeling of sugarcane bagasse conversion to levulinic acid using response surface methodology (RSM), artificial neural networks (ANN), and fuzzy inference system (FIS): A comparative evaluation", Fuel.** 329 (2022) 125409. https://doi.org/10.1016/J.FUEL.2022.125409. **(SCI, IF : 8.035).**

[4] **M. Helen Kalavathy, G. Keerthiga*, "Review on conventional preparation, properties of graphene and growth of graphene from fruit wastes", Brazilian Journal of Chemical Engineering.** (2022). https://doi.org/10.1007/s43153-022-00259-x. **(SCI, IF : 1.771).**

[5] Abinaya Stalinraja, G. Keerthiga*, S. Venkatesan, S. M J, S. Ghosh, T. Selvaraj, "Electrochemical reduction of CO2 on Cu doped titanium nanotubes—An insight on ethylene selectivity", Electrochimica Acta. 431 (2022) 141078. https://doi.org/10.1016/J.ELECTACTA.2022.141078. (SCI, IF : 7.336).

[6] K. Sofiya*, S. Prabhakar, "Performance of PES Membrane Contactor on the Separation of Dilute Acetic Acid from Aqueous Forms", International Journal of Membrane Science and Technology. 9 (2022) 25–32. https://doi.org/10.15379/2410-1869.2022.03. (SCOPUS, SNIP : 0.04).

[7] S. Arun, L. Xin, O. Gaonkar, B. Neppolian, G. Zhang, Paromita Chakraborty*, "Antibiotics in sewage treatment plants, receiving water bodies and groundwater of Chennai city and the suburb, South India: Occurrence, removal efficiencies, and risk assessment", Science of The Total Environment. 851 (2022) 158195. https://doi.org/10.1016/J.SCITOTENV.2022.158195. (SCI, IF : 10.753).

[8] C. Yazhini, J. Rafi, Paromita Chakraborty*, S. Kapse, R. Thapa, B. Neppolian, "Inner filter effect on amino-functionalized metal-organic framework for the selective detection of tetracycline", Journal of Cleaner Production. 373 (2022) 133929. https://doi.org/10.1016/J.JCLEPRO.2022.133929. (SCI, IF : 11.072).

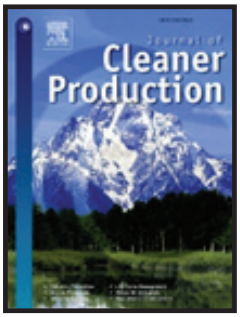
[9] P. Mohasin, Paromita Chakraborty*, N. Anand, S. Ray, "Risk assessment of persistent pesticide pollution: Development of an indicator integrating site-specific characteristics", Science of The Total Environment. (2022) 160555. https://doi.org/10.1016/J.SCITOTENV.2022.160555. (SCI, IF : 10.753).

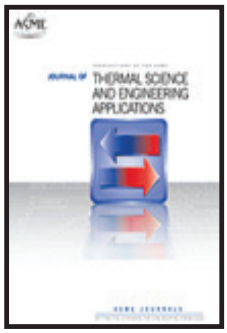
[10] K. Suresh*, Ashish Kapoor, Krishna Srihari Bonasi, S. Balasubramanian, "Thermal processing of liquid food in a rectangular prism-type container" AIP Conference Proceedings. 2516 (2022) 410003. https://doi.org/10.1063/5.0108 654. (SCOPUS, SNIP : 0.262).

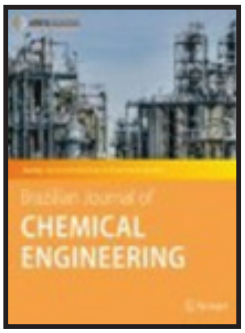
[11] S. Vishali*, E. Poonguzhali, Indhurekha Banerjee, Sharan Sakshi George, P. Srinivasan, "Purification of domestic laundry wastewater in an integrated treatment system consists of coagulation and ultrafiltration membrane process", Chemosphere. 314 (2023) 137662. https://doi.org/10.1016/J.CHEMOSPHERE.2022.137662. (SCI, IF : 8.943).

[12] C. Sreelakshmi, S. Kiruthika, R. Jeyalakshmi, "A review of chemical and bioelectrochemical process of N , P nutrient", Desalination and Water Treatment. 276 (2022) 28967. https://doi.org/10.5004/dwt.2022.28967. (SCI, IF : 1.254).

[13] Thilakavathi Ramamurthy, K. Suresh*, "Importance of temperature-dependent non-Newtonian fluid in conventional thermal processing", Journal of Thermal Science and Engineering Applications. (2022) 4056468.https://doi.org/10.1115/1.4056468. (SCI, IF : 1.879).



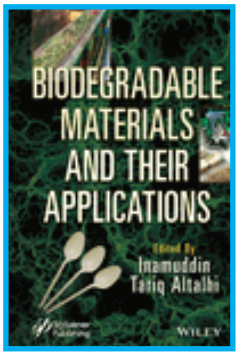


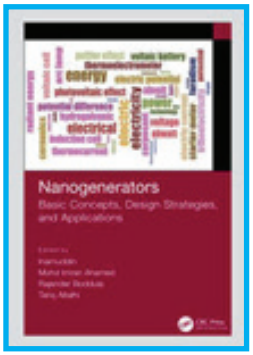


Book Chapters Published

[1] **S. Vishali*, M. Susila, S. Kiruthika, "Biodegradable Materials in Electronics", in: Biodegradable Materials and Their Applications,** (2022) pp. 1–27, **Wiley online library,** https://doi.org/10.1002/9781119905301.ch1.

[2] **R. B. Panicker, A. Kapoor, K. Deepa*, S. Prabhakar, "Triboelectric Nanogenerators", in: Nanogenerators: Basic Concepts, Design Strategies, and Applications,** (2022) pp. 121-130, **CRC Press,** https://doi.org/10.1201/9781003187615-7.





Patent Published

S. No.	Inventors	Title of the Patent	Date of Publishing	Patenting Agency, Application Number, Patent Number
1	Dr. B. Muthukumaran Dr. V. Selvarani Dr. K. Ponmani Dr. M. Priya **Dr. S. Kiruthika** Ms. A. Gayathri Ms. K. Mahalakshmi	**Design a smarter gaseous fuel cell that is efficient in producing electricity for running automobile**	7 October, 2022	**Indian Patent Office,** 202241055902 40/2022

Projects Sanctioned

S. No.	Investigator(s)	Project Title	Funding Agency	Sanctioned Amount
1	**Dr. Paromita Chakraborty**	**Genome sequencing and wastewater surveillance in open drains of Chennai city and the suburbs for predicting the future waves of COVID-19 pandemic**	**Department of Science and Technology - Science and Engineering Research Board (DST – SERB)**	**42.52 Lakhs**
2	**Dr. G. Keerthiga**	**Hybrid metal organic framework for Electrochemical reduction of CO2**	**UGC Start Up**	**8 Lakhs**
3	**Dr. S. Vishali** **Dr. S. Kiruthika**	**Transformation of Floral Waste into Value-Added Products: A Sustainable Approach Towards Waste Management**	**Unnat Bharat Abhiyan (UBA) SEG: Sanitation and Solid Waste Management**	**1 Lakh**

Dr. Paromita Chakraborty

Dr. G. Keerthiga

Dr. S. Vishali

Dr. S. Kiruthika

Hearty Congratulations to Dr. Paromita Chakraborty, Dr. G. Keerthiga, Dr. S. Vishali and Dr. S. Kiruthika for procuring the grants. We wish you all the best for the successful completion of the projects!

Awards /Achievements - Faculty

"Teaching is more than imparting knowledge; it is inspiring change. Learning is more than absorbing facts; it is acquiring understanding."

- William Arthur Ward

[1] The following faculty members from the Department of Chemical Engineering received the **Certificate of Appreciation for Teaching and Research** for the Academic Year 2021 - 2022 on 22 September, 2022 from The Dean CET, SRMIST.

Dr. K. Suresh
Dr. M. P. Rajesh
Dr. Paromita Chakraborty
Dr. S. Anandhakumar
Dr. S. Vishali
Dr. M. Magesh Kumar
Dr. K. Anbalagan
Dr. K. Selvam
Dr. S. Kiruthika
Dr. E. Kavitha
Dr. E. Poonguzhali
Dr. P. Muthamilselvi
Dr. D. Nanditha
Dr. K. Deepa
Dr. S. Sam David
Dr. G. Keerthiga
Dr. Ashish Kapoor
Dr. B. Karunanithi

The Awardees of Chemical Engineering

Technical Expert Members

[1] **Dr. S. Vishali** was appointed as Subject Matter Expert and Interview Panel member for the Carbon Zero Challenge (CZC 2022) held at IIT Madras on 23 December, 2022. The theme for the event was Circularity in Resources Conservation. **Dr. S. Vishali** along with two other experts from the field reviewed the applications of the participating teams.

Dr. S. Vishali with **Mr. Gagandeep Singh Bedi, I. A. S.,**
Commissioner, Greater Chennai Corporation at CZC 2022

Invited Talks Delivered

[1] **Dr. M. P. Rajesh** delivered a **Technical Talk** on **Ionic-Liquid Assisted Processing of Microalgae for Biodiesel Production** in a seminar organized by the Department of Biotechnology, Manipal Institute of Technology, Manipal Academy of Higher Education, Karnataka on 18 July, 2022.

[2] **Dr. S. Anandhakumar** and **Dr. K. Deepa** contributed as **Resource persons** for the **Six Days Faculty Development Programme on Current Trends in Nanomaterials and its Applications (CTNA – 2022)** organized by the Department of Chemical Engineering, College of Engineering and Technology, SRM Institute of Science and Technology, Kattankulathur held on 23 and 27 August, 2022 respectively. **Dr. S. Anandhakumar** delivered a lecture on "Polyelectrolyte Multilayer Capsules for Cancer Chemo-Photothermal Therapy". **Dr. K. Deepa** delivered a lecture on "Nanocatalysts for Environmental Applications".

[3] **Dr. Paromita Chakraborty** contributed as the **Resource person** in the **FDP on Smart Waste Mangement 2022** organized by the Department of Chemical Engineering, College of Engineering and Technology, SRM Institute of Science and Technology, Kattankulathur held on 14 September, 2022. She delivered a lecture on **"Plastic Waste Management in the Developing Economies".**

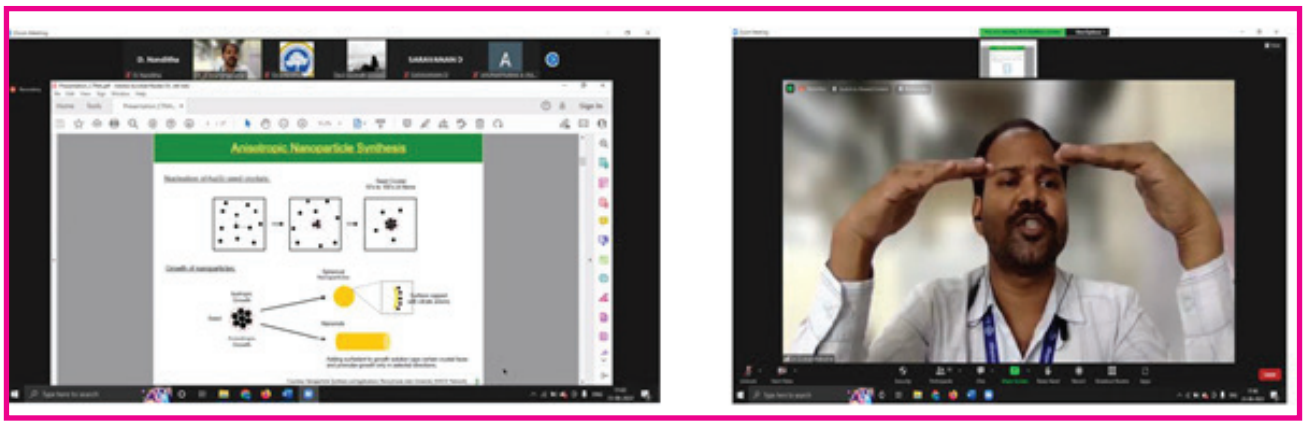
[4] **Dr. Paromita Chakraborty** contributed as the **Resource person** in the **E-waste National Conference** organized by the Department of Environmental Science, Shillong College held from 29 to 30 September, 2022. She delivered a lecture on **"The issue of electronic waste: Environmental Concerns, Management and Opportunities for Entrepreneurship".**

[5] **Dr. E. Poonguzhali** contributed as the **Resource person** in the **Five Days Faculty Development Programme on Recent Advancements in Water Treatment (RAWT 2022),** organized by the Department of Chemical Engineering, KPR Institute of Engineering and Technology, Coimbatore in association with Indian Desalination Association- South Zone held on 21 October, 2022. She delivered a lecture on **"Current Advances in Membrane Technologies for Saline Wastewater Treatment".**

[6] **Dr. S. Vishali, Dr. E. Kavitha, Dr. S. Kiruthika, Dr. E. Poonguzhali, Dr. D. Nanditha** and **Dr. K. Deepa** contributed as the **Panel Judges for Oral Presentation** in **Chemflux,** 10.0, the Annual Technical Symposium of the Department of Chemical Engineering, College of Engineering and Technology, SRM Institute of Science and Technology, Kattankulathur held from 3 to 4 November 2022.

[7] **Dr. E. Poonguzhali** contributed as the **Panel Judge for Poster Presentation** in **International Conference on Higher Education Institute's Challenges Solutions for Sustainable Development Goals 2022 (ICSDG 2022)** organized by the Department of Chemical Engineering, College of Engineering and Technology, SRM Institute of Science and Technology, Kattankulathur held on 16 November, 2022.

[8] **Dr. Paromita Chakraborty** contributed as the **Resource person** in the **2nd International Academic Forum** organized by the College of Marine Ecology and Environment, Shanghai Ocean University, China held on 27 November, 2022. She delivered a lecture on **"Surveillance of plastic additives in the Ganges and Sundarban Wetlands: implications on risk assessment".**



Dr. S. Anandhakumar delivering a lecture on **"Polyelectrolyte Multilayer Capsules for Cancer Chemo-Photothermal Therapy in CTNA, 2022**

Dr. Paromita Chakraborty at the **E-waste National Conference,** Shillong College

Dr. E. Poonguzhali receiving a memento from **Dr. K. Suresh,** HoD, Chemical Engineering and **Dr. Paromita Chakraborty** for her role as **Panel Judge, Poster Presentation** at **ICSDG 2022**

Conference Presentation - Faculty

S. No.	Faculty	Title of the Paper Presented	Event	Organized by	Date
1.	Dr. M. P. Rajesh	Removal of Nitrate and Fluoride ions from aqueous solution using Zr (IV) loaded cyclodextrin	2nd International Conference on Water Technologies – 2022	IIT Bombay	1 to 2 December, 2022
2.	Dr. M. P. Rajesh	Study of nitrate removal on chitosan-based beads in comparison with INDION NSSR	Advance Materials for Strategic Application and Sustainable Future (AMSAS - 2022)	KPRIET, Coimbatore	16 to 17 December, 2022

Conference Presentation - Students

S. No.	Student/ Scholar	Title of the Paper Presented	Event	Organized by	Date
1.	Aaditya Sarin	A fire safety IOT device for Lithium batteries	22nd National Convention of Electrochemists	PSG College of Technology, Coimbatore	26 to 27 August, 2022
2.	D. Alice Jasmine	Synergetic pre-treatment of rice straw through integrated methodology for fine chemical synthesis	Conference on Environmental Pollution and Control Technologies	Annamalai University	26 to 27 August, 2022

3.	**M. B. Abinaya**	**Enhanced visible light photocatalytic degradation of organic pollutant using heterogeneous photocatalyst**	**Conference on Environmental Pollution and Control Technologies**	Annamalai University	26 to 27 August, 2022
4.	**Aaditya Sarin**	**Review of electrolyser technologies for hydrogen production**	**SCHEMCON -2022**	National Institute of Technology, Warangal	23 to 24 September, 2022
5.	**G. Kanishka**	**Hydroponic from RO rejected industrial wastewater**	**National Seminar on Electrochemical Energy conversion and Storage**	Naval Science Technological Laboratory, Visakhapatnam	28 to 29 September, 2022
6.	**L. Gopika**	**Synthesis and characterization of different pH sensitive hydrogel**	**International Chemical Engineering Conference 2022**	IIT Patna	12 to 13 November,22
7.	**Nithish Sridar**	**Value recovery using membrane solvent extraction process**	**International Conference on Higher Education Institute's Challenges Solutions for Sustainable Development Goals 2022 (ICSDG 2022)**	Department of Chemical Engineering, CET, SRMIST, KTR	16 November, 2022
8.	**L. Gopika**	**Adsorption of norfloxacin drug using bagasse-based biochar beads**	**Advances in Smart Materials, Chemical and Biochemical Engineering (CHEMSMART 2022)**	NIT Rourkela	16 to 18 December, 2022
9.	**Rahul Adithya C.**	**Effect of sonication time on solvent extraction of Rosa × damascena essential oil**	**Chemcon 2022**	Harcourt Butler Technical University, Uttar Pradesh	27 to 30 December, 2022

Events Participated by faculty

S. No.	Faculty	Title	Event	Organizer	Date
1.	Dr. E. Poonguzhali, Dr. D. Nanditha	IP Awareness / Training Program under National Intellectual Property Awareness Mission	Awareness/ Training program	Intellectual Property Office, India	3 August, 2022
2.	Dr. K. Sofiya	Workshop on Experimental approaches in Material Characterization	Workshop	Department of Chemistry, SRMIST, KTR	11 to 12 August, 2022
3.	Dr. S. Sam David	Biostatistics with Statistical Software	Workshop	Centre for Statistics, SRMIST	22 to 26 August, 2022
4.	Dr. S. Vishali, Dr. M. Magesh Kumar, Dr. S. Kiruthika, Dr. E. Poonguzhali	Current Trends in Nanomaterials and its Applications (CTNA 2022) Faculty Development Program	Faculty Development Program	Department of Chemical Engineering, CET, SRMIST, KTR	22 to 27 August, 2022
5.	Dr. K. Tamilarasan, Dr. M. Magesh Kumar, Dr. E. Kavitha, Dr. K. Selvam, Dr. K. Sofiya, Mr. V. Ganesh Dr. E. Poonguzhali, Dr. D. Nanditha Dr. K. Deepa, Dr. S. Sam David, Dr. G. Keerthiga	Smart Waste Management (SWM 2022)	Faculty Development Program	Department of Chemical Engineering, CET, SRMIST, KTR	12 to 17 September, 2022

6.	Dr. S. Sam David	Workshop on Data Analytics in Healthcare	Workshop	Department of Data Science and Business Systems, School of Computing, SRMIST	14 to 16 September, 2022
7.	Mr. V. Ganesh	PDP on Electronics Cooling using Ansys ICEPAK	Professional Development Progra	Department of Chemical Engineering, CET, SRMIST, KTR	16 November, 2022
8.	Dr. K. Deepa	Research Opportunities in Semiconductor Materials and Devices	Workshop	Department of ECE, CET, SRMIST, KTR	14 to 19 October, 2022
9.	Dr. E. Kavitha, Dr. K. Sofiya	Recent Advancements in Water Treatment (RAWt 2022)	Faculty Development Program	KPR Institute of Engineering and Technology, Coimbatore	17 to 21 October, 2022
10.	Mr. V. Ganesh	Machine Learning for Multidisciplinary Fields	Faculty Development Program	Department of Data Science and Business Systems, School of Computing, SRMIST	27 to 31 October, 2022
11.	Dr. E. Kavitha, Dr. D. Nanditha	X-Reality Technologies using Unity	Faculty Development Program	Center for Immersive Technologies, SRMIST	17 to 23 December, 2022
12.	Dr. S. Sam David	Programming for Problem Solving	Faculty Development Program	CodeTantra Tech Solutions Pvt. Ltd.	15 to 21 December, 2022

Events Participated by Students

S. No.	Student/Scholar	Title	Event	Organizer	Date
1.	Abinaya A. S., Takumi Nagasaka	Workshop on Experimental Approaches in Materials Characterization (EAMC-2022)	Workshop	Department of Chemistry, SRMIST	11 to 12 August, 2022
2.	Arumugam Thrisa, Palak Kachhawah, A.U. Mitun	Current Trends in Nanomaterials and its Applications	Faculty Development Program (Student volunteers)	Department of Chemical Engineering, CET, SRMIST, KTR	22 to 27 August, 2022
3.	Aaditya Sarin, Shivanjali Ramakrishnan	Online Industrial Internship Program on PETROLEUM REFINERY ENGINEERING	Online Start- Up Training Program – An Internship	Terra-Green Technolgies Pvt. Ltd.	2 August to 20 September, 2022
4.	Saanz Wanjari	HACK SUMMIT 3.0	Aaruush 2022	SRMIST	22 to 23 October, 2022
5.	Muhammad Abdul Khader	Paper Presentation	Chemflux 10.0	Department of Chemical Engineering, CET, SRMIST, KTR	3 November, 2022
6.	Muhammad Abdul Khader	Non- Tech Event	Chemflux 10.0	Department of Chemical Engineering, CET, SRMIST, KTR	3 November, 2022
7.	L. Gopika & C. Rahul Adithya	Clean water and Sanitation	Sustainable Development Goals 2022	Department of Chemical Engineering, CET, SRMIST, KTR	15 to 17 November, 2022

Industrial Visit

Company Name: **Paradeep Phosphates Limited**

Location: Jai Kisaan Bhawan, Zuarinagar, Sancoale, Goa

Industry type: Phosphatic fertilizer manufacturing company. Fertilizers are marketed under the brand names of "Jai Kisaan" and "Navratna".

About the company

Paradeep Phosphates Limited (PPL) is one of India's largest private sectors phosphatic players, producing a wide range of phosphatic grades including DAP, N-10, N-12, N-14, N-19, N-20 and N28. The plant located in Goa also produces urea, and is a key supplier to the states of Maharashtra and Karnataka. The company is also a major supplier of various industrial products like gypsum, Zypmite, HFSA (Hydrofluorosilicic Acid), sulphuric acid and ammonia.

The final year students of batch 2019-2023 from the Department of Chemical Engineering had visited Goa and Coorg, Karnataka accompanied by Dr. K. Anbalagan and Dr. G. Keerthiga from 26 to 30 September 2022. This industry was selected because of its prominence in the fertilizer manufacturing sector. During this visit, a full overview of the industry was presented. Maintenance of the equipments and ethics considered during storage and disposal of harmful greenhouse gases like carbon dioxide and sulphur which evolved from the processes was also explained.

Dr. Anbalagan and Dr. Keerthiga with IV-year, B. Tech. Chemical Engineering students during the Industrial visit

Manak Manthan Programme

The Chennai Branch - I of the **Bureau of Indian Standards (BIS)** conducted the **'Manak Manthan'** programme on 26 October, 2022, at Hotel Turyaa in Perungudi. Students from SRMIST namely **Turumella Vighnesh, Gauri Awasthi, Mithun A. U.** and **Thrisa Arumugam** represented the Department of Chemical Engineering at the event.

'Manak' translates to 'standard', and the event aimed at providing college students and industrial experts an insight into the implementation of standards for various commodities. The programme was moderated by **Ms. G. Bhavani,** Scientist and Head at the BIS Southern Region Office. **Dr. Syed Amanullah,** Chief Director at CIPET was the honorable Chief Guest. The theme for the event specifically touched upon **'Discussion on Indian Standards for Glass Fiber Reinforced Plastic (GRP) for indoor glass shutters'.** The BIS team elaborated on the series of quality and compatibility tests that products undergo before receiving an ISI license or certification. The programme was an informative experience for the students and was an important step towards sensitizing consumers about their rights.

Turumella Vighnesh, Gauri Awasthi, Mithun A. U. and **Thrisa Arumugam** with **Ms. G. Bhavani, Scientist and Head at the BIS Southern Region Office**

Certification Completed

[1] **Dr. M. Magesh Kumar** and **Dr. K. Anbalagan** have completed the certification of **Internal Auditing for Environment Management System based on ISO 14001:2015** conducted by the **Academy division of TUV – SUD South Asia Pvt. Ltd.** on 3 November, 2022.

Dr. Magesh Kumar and Dr. K. Anbalagan receiving the certificate from Dr. S. Ponnusamy, Registrar, SRMIST

Online Courses Completed

[1] **Dr. K. Deepa, Dr. S. Sam David** and **Dr. G. Keerthiga** completed a Certification course by the **All India Council for Technical Education (AICTE) - National Initiative for Technical Teachers Training** on **Module 6: Student Assessment and evaluation** in July 2022.

[2] **Dr. K. Deepa, Dr. S. Sam David** and **Dr. G. Keerthiga** completed a Certification course offered by the **All India Council for Technical Education (AICTE) - National Initiative for Technical Teachers Training** on **Module 7: Creative Problem Solving, Innovation and Meaningful R & D** in July 2022.

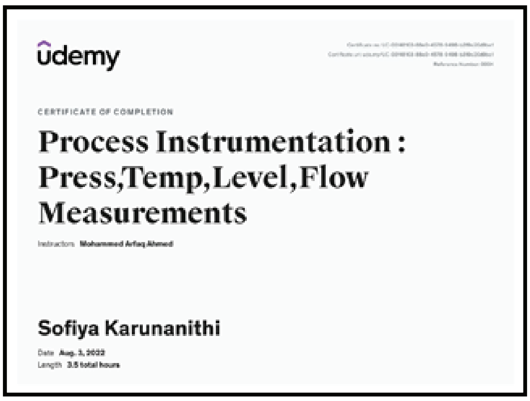
[3] **Dr. K. Deepa, Dr. S. Sam David** and **Dr. G. Keerthiga** completed a Certification course offered by the **All India Council for Technical Education (AICTE) - National Initiative for Technical Teachers Training** on **Module 8: Institutional Management & Administrative Procedures** in July 2022.

[4] **Dr. K. Deepa, Dr. S. Sam David** and **Dr. G. Keerthiga** completed all the 8 modules of the Certification course offered by the **All India Council for Technical Education (AICTE) - National Initiative for Technical Teachers Training** in July 2022.

[5] **Dr. K. Sofiya** completed a Certification course offered by **Udemy** titled **Process Instrumentation: Press, Temp, Level, Flow, Measurements** on 3 August, 2022.

[6] **Harish Mishra** of final year, B. Tech. completed an online course titled **MATLAB Onramp** offered by **Mathworks Training Services** on 3 August, 2022.

[7] **Kaviya K.** of final year, B. Tech. completed an online course in **Coursera** titled **Chemicals and Health** on 6 August, 2022.



Ph.D. Awarded

Mr. K. Selvam successfully completed his Ph.D. public viva-voce examination on 19 September, 2022 at SRM Institute of Science and Technology, Kattankulathur.

Title: Theoretical and Experimental Studies on the Formation of Hollow Fiber Membrane

Supervisor: Dr. B. Karunanithi

Mr. K. Selvam defending his thesis

Dr. D. Nanditha and **Dr. K. Selvam** receiving their Ph. D. degree certificate from the **Honorable Chancellor, SRMIST**

Hearty Congratulations to Dr. D. Nanditha and Dr. K. Selvam who were awarded with Ph.D. degrees in the Convocation held on 25 September, 2022.

Students' Performance (2022 Batch)

"Education's purpose is to replace an empty mind with an open one."

- Malcolm Forbes

Hearty Congratulations to the B. Tech. and M. Tech students who passed out in 2022!

Rank holders

B. Tech.

Deshmukh Ovi Chaitanya
Gold medal
CGPA 9.76

Dripta Sanyal
Silver medal
CGPA 9.75

M. Tech.

Vyas Bhumika Sachinbhai
Gold medal
CGPA 9.37

Summary of Results	B. Tech. (2018-2022 batch)	M. Tech. (2020-2022 batch)
Total number of students	87	11
Number of students graduated in 2022	83 (95.4 %)	11 (100 %)
Number of students graduated as First class with distinction	48 (57.8 %)	8 (72.7 %)
Number of students graduated as First class	35 (42.2 %)	3 (27.3 %)

Encouraging the Toppers!

In order to motivate the II year B. Tech. students for their performance in end-semester exams, **Dr. D. Nanditha** gifted pens to the toppers while distributing the grade sheets on 22 September, 2022

Ph.D. Progress Details of Research Scholars

(DC Meeting-I/ Comprehensive Viva/ Pre Ph.D.-Presentation/ Synopsis Meeting/ Synopsis Submission/ Thesis Submission/ Oral Viva Voce)

S. No.	Research Scholar (Category)	Supervisor	Area of Research	Research Progress	Date
1.	**Mr. P. Ramesh** (Full Time)	**Dr. K. Suresh**	**Dehumidification of Lean Gas**	**Completed Comprehensive examination**	25 August, 2022
2.	**Mr. K. Selvam** (Part Time - Internal)	**Dr. B. Karunanithi**	**Theoretical and Experimental Studies on the Formation of Hollow Fiber Membrane**	**Completed viva-voce**	19 September, 2022
3.	**Ms. Meenu Mariam Jacob (Full Time)**	**Dr. P. Muthamilselvi**	**Process Modeling for the Decontamination of Chlorpyrifos**	**Completed Comprehensive examination**	19 October, 2022
4.	**Ms. R. Thilakavathi (Full Time)**	**Dr. K. Suresh**	**Numerical Analysis of Heat Transfer Behavior in Thermal Processing of Homogeneous Liquid Foods**	**Thesis submitted**	3 November,2022

On Campus Placements
July to December, 2022 (B. Tech. Batch 2019 - 2023 and M. Tech. Batch 2021-2023)

S. No.	Student	Company Placed	Job profile	Salary package (₹)
1.	 Shubhi Dixit	Amazon	Manager I, Operations	Stipend during training: 70000 p.m. Salary: 29 lakhs
		Cognizant	Trainee Engineer	4 lakhs
2.	 Varnika Singh	Amazon	Manager I, Operations	Stipend during training: 70000 p.m. Salary: 29 lakhs
		Cognizant	Trainee Engineer	4 lakhs
3.	 Deep Katiyar	JSW Energy	Trainee Engineer	9.75 lakhs
		Cognizant	Trainee Engineer	4 lakhs
4.	 Kaviya	Zenoti	Trainee Engineer	8.64 lakhs

5.	 Rajeshwaran N.	Reliance Industries	Trainee Engineer	8 lakhs
		TCS	Trainee Engineer	3.6 lakhs
6.	 Raakesh B. R.	Reliance Industries	Trainee Engineer	8 lakhs
		TCS	Trainee Engineer	3.6 lakhs
7.	 Patel Smit Vijayakumar	Reliance Industries	Trainee Engineer	8 lakhs
8.	 Kavya Roy	PharmaAce	Trainee Engineer	7.5 lakhs
9.	 Swathik Sajeesh	Planet Spark	Trainee Engineer	7 lakhs

10.	 Haran Kishore	InMovidu Technologies	Trainee Engineer	7 lakhs
11.	 Afeez Ahamed A.	Unschool	Trainee Engineer	6.5 lakhs
12.	 Ashwin V Nair	Consultadd services Pvt. Ltd.	Trainee Engineer	5 lakhs
		Intellipaat	Trainee Engineer	3.84 lakhs
13.	 Vallabhaneni Kaushik	Vintrus Ed-Tech	Trainee Engineer	5 lakhs
14.	 Divyash Singh	Accenture	Trainee Engineer	4.5 lakhs

15.	 Indrani Das	Cognizant	Trainee Engineer	4 lakhs
16.	 Parthasarathy A	Cognizant Gen C Select	Trainee Engineer	4 lakhs
17.	 Aswin Krishna	Intellipaat	Trainee Engineer	3.84 lakhs
18.	 Shwetha Udayan	Intellipaat	Trainee Engineer	3.84 lakhs
19.	 S Shriram	TCS	Trainee Engineer	3.6 lakhs

20.	 Sahana Sadhukhan	TCS	Trainee Engineer	3.6 lakhs
21.	 Nithish S. (M. Tech.)	TCS	Trainee Engineer	3.6 lakhs
22.	 Arkaprava Ray	Tech Destiny	Trainee Engineer	3.5 lakhs
23.	 Yokeshwaran R.	Garuda Aerospace	Project Manager	3 lakhs
24.	 Balmurugan N.	Garuda Aerospace	Project Manager	3 lakhs

Placement Summary (Batch 2018 - 2022)

Number of students registered for placements	48
Number of job offers till December 2022	30
Average Salary Package (₹)	6.7 Lakhs

Hearty Congratulations dear students!
Wishing you all the best and many more success in your future endeavours!

Admitted for Higher Studies (Batch 2018 - 2022)

S. No.	Name of the Student	Degree	University
1.	 Kevin Cheriyan	M.Sc. in Advanced Chemical Engineering	University of Greenwich, UK
2.	 Yuktha Krishna Therambil	M.S. in Human Resource Management and Development	NYU School of Professional Studies, USA
3.	 Abhijith Sunil Warrier	M.Sc. in Advanced Process Integration and Design	The University of Manchester, UK

4.	 Suryadevara Jaspreeth Chowdary	M.S. in Chemical Engineering	Graduate School of Purdue University, USA
5.	 Jannabhatla Nydhruva Kameswara Prasad	M.Eng. in Chemical Engineering	University of Buffalo, USA
6.	 Yuvashree I	M.Eng. in Chemical and Materials Engineering	University of Alberta, Canada

Department Events Organized

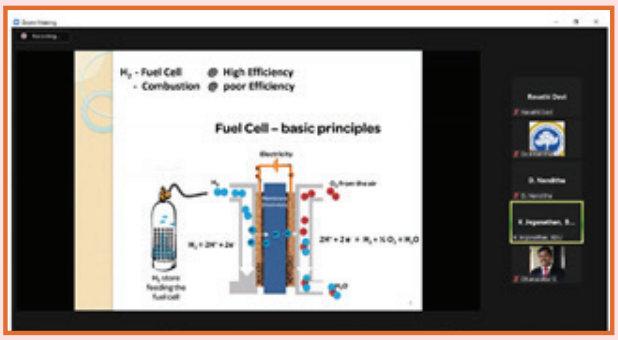
[1] Six Days **Faculty Development Programme** on **"Current Trends in Nanomaterials and its Applications"**

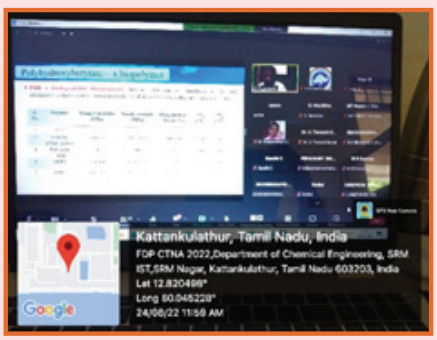
22 to 27 August, 2022

Convenor
Dr. K. Suresh, Associate Professor & Head in - charge, Chemical Engineering

Co-Convenors
Dr. E. Kavitha, Assistant Professor, Chemical Engineering
Dr. D. Nanditha, Assistant Professor, Chemical Engineering

About the event
The FDP aims to provide opportunities to faculty members, research scholars, and postgraduate students to enrich their teaching skills and research in the field of nanotechnology and its latest trends. The FDP was attended by 100 participants from faculty members of Chemical Engineering, Physics, Chemistry, Mathematics, Civil Engineering, Ph. D. research scholars, and PG students. There were 56 external participants from various universities in and around India.





[2] Entrepreneur Alumni Connect 2022

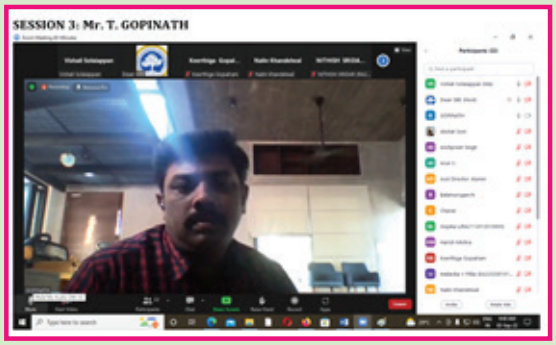
1 to 2 September, 2022

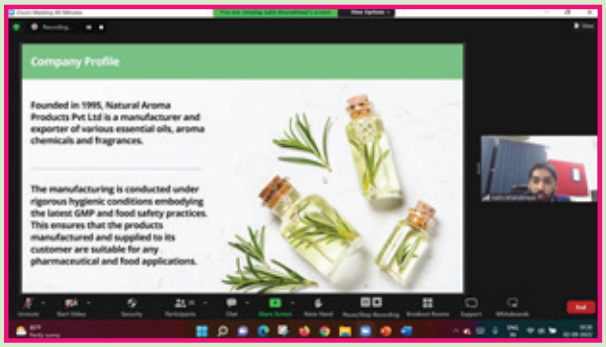
Convenor
Dr. K. Suresh, Associate Professor & Head in - charge, Chemical Engineering

Co-Convenors
Dr. S. Vishali, Associate Professor, Chemical Engineering
Dr. E. Poonguzhali, Assistant Professor, Chemical Engineering

Organizing Committee
Dr. A. Rathinam, Director, Alumni Affairs
Mrs. Radha Ravindran, Assistant Director, Alumni Affairs

About the event
The Department of Chemical Engineering and the Directorate of Alumni Affairs (DAA), SRMIST have ensured continual interaction of the alumni with the current students and faculty in the department. This edition of the Alumni Connect proudly presented the alumni who have become successful entrepreneurs.





[3] IIC - Innovation Ambassador Activity

6 September, 2022

Title of the talk: Application of Emotional Intelligence and Business Intelligence Quotient in Human Resource Development

Resource person
Dr. T. Karthick
Innovation ambassador
Assistant Professor
Department of Data Science and Business Systems

Organized by
Dr. K. Anbalagan, Assistant Professor, Chemical Engineering

About the event
Research scholars and students were motivated in expressing emotional intelligence.

[4] Online Seminar - Shikshak Parv (Teacher's Day) Celebration Talk

9 September, 2022

Resource person
Dr. N. Anantharaman
Visiting Faculty, Formerly Professor (HAG)
Department of Chemical Engineering
National Institute of Technology, Trichy

Organized by
Dr. M. Magesh Kumar, Assistant Professor, Chemical Engineering

About the event
Dr. N. Anantharaman, Visiting Faculty, NIT Trichy delivered an online seminar on**"Teachers Role in National Education Policy (NEP) Implementation in Chemical Engineering Department"**

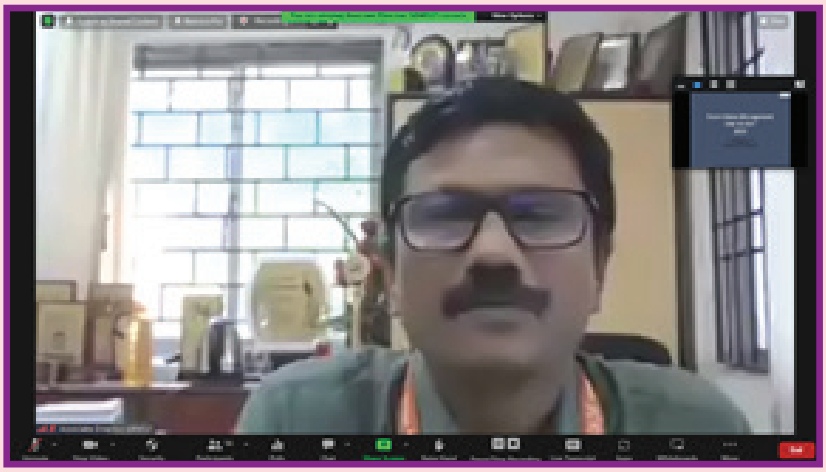
[5] Six Days **Faculty Development Programme on "Smart Waste Management SWM 2022"**

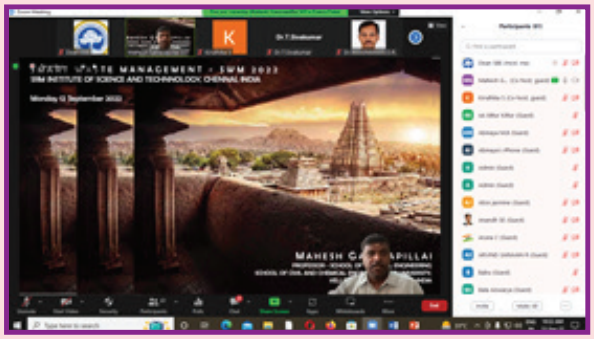
12 to 17 September, 2022

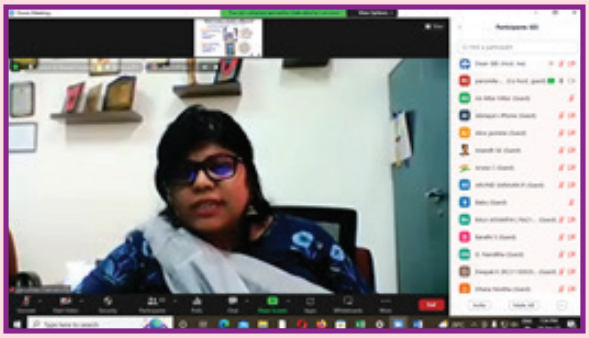
Convenor
Dr. K. Suresh, Associate Professor & Head In-charge, Chemical Engineering

Co-Convenors
Dr. S. Vishali, Associate Professor, Chemical Engineering
Dr. S. Kiruthika, Assistant Professor, Chemical Engineering

About the event
The Faculty Development Programme on 'Smart Waste Management -2022' provided a forum for exchanging ideas and experiences in this area. The International experts and industry practitioners develop strategies and point out ways and new prints to achieve effective waste management to pave the way for a zero-waste future. The aim is to arouse the interest of scientists and citizens and to inform them about the latest developments in the field of waste management.







[6] **International Workshop for Coastal Cleanup - "#Cshore Cleanmore"**

17 September, 2022

Organizers

Dr. Paromita Chakraborty, Research Associate Professor, Chemical Engineering

About the event

On the occasion of the International Coastal Cleanup Day on 17 September, 2022, Mu Gamma Consultants with partner institutions, SRMIST, TERI, NIVA, CIPET and Toxics Link organized a beach cleanup program at Besant Nagar Beach, Chennai at 7.30 AM (IST). The event is a part of the Indo-Norwegian Marine Litter Project-INOPOL and is supported by The Royal Norwegian Embassy in New Delhi and UNEP India. The coastal cleanup drive was followed by an awareness generation session (virtual), where experts shared their reflections on various aspects of marine pollution.

[7] **Ayudha Pooja Celebration 2022**

29 September, 2022

Organizers

Dr. S. Vishali, Associate Professor, Chemical Engineering

Dr. E. Poonguzhali, Assistant Professor, Chemical Engineering

About the event

Every educational institute or organization associated with education celebrates and observes Ayudha Pooja. The Ayudha Pooja celebration for the year 2022 was planned and organized by the team of Chemical Engineering faculty members. All the teaching and non-teaching staffs, research scholars and students were cordially invited to attend this program. Everyone was united together to worship the workplace with great devotion in the Mechanical Operation lab of the Chemical Engineering department. This gathering brought an extra smile and positivity among all.

[8] **Annual Technical Symposium - Chemflux 10.0**

3 to 4 November, 2022

Theme: **Innovative Waste management**

Convenors
Dr. K. Suresh, Associate Professor & Head in-charge, Chemical Engineering
Dr. G. Keerthiga, Assistant Professor, Chemical Engineering

Student co-ordinators
Anuragh, III-year, B. Tech.
Kanishka, III-year, B. Tech.

About the event
Chemflux is conducted every year with a new theme that challenges the youth of the nation to experiment and think in real-life situations. With technical events including informative lectures and paper presentations, Chemflux 10.0 inspires young minds and encourages maximum participation from all over the nation. The events included all kinds of waste management especially Solid, Water, Energy & Emissions.

[9] **International Conference** on **"Higher Education Institutes' Challenges & Solutions- Sustainable Development Goals (SDG) '22"**

15 to 17 November, 2022

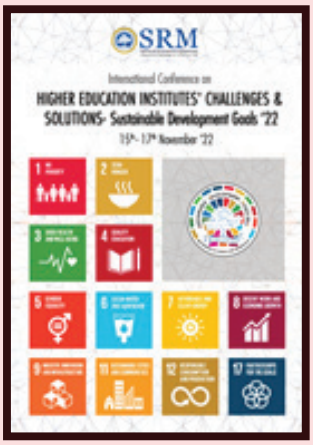
SDG 6 Theme (Clean Water and Sanitation)

Convenor

Dr. Paromita Chakraborty, Research Associate Professor, Chemical Engineering

About the event

Health emergencies like the Covid 19 pandemic have shown the importance of building resilient communities and health systems to combat challenges and shape a sustainable future. Through research and action, Higher Education Institutes (HEIs) can play an important role in achieving SDGs, which aim to end poverty, save the planet, foster gender equality, protect and promote cultures, and ensure prosperity for all. The objectives of the conference are to enhance awareness about SDG 6 and the challenges in achieving them and to provide an interactive platform for academia, industry, government and civil society to discuss the role of HEIs in achieving SDG 6.



Research Seminar Series

The Department of Chemical Engineering, SRMIST planned to conduct a weekly seminar to provide an open forum for Ph. D. scholars and M. Tech. students. This can be an opportunity for every researcher to improve their research work, oral communication, to learn new ideas from their peers and also to build a professional network with fellow students and faculties. The seminar will be an open forum to discuss their research work among the scholars, students and faculty members for their self-evaluation.

Faculty co-ordinator: **Dr. S. Sam David,** Assistant Professor
Student co-ordinator: **Ms. Meenu Mariam Jacob,** Ph. D. scholar

Title: **Legacy and new chlorinated persistent organic pollutants in the rivers of south India: occurrences, sources, variations before and after the outbreak of the COVID-19 pandemic**

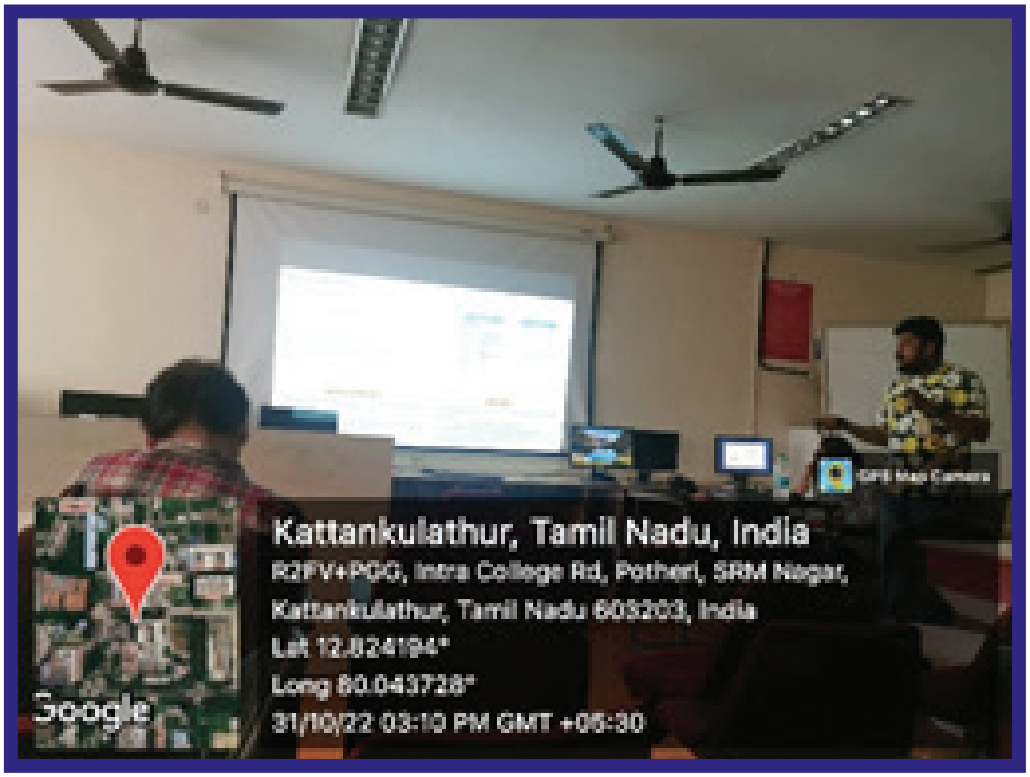
Date/Time: 31.10.2022 3:00 PM

Venue: Computer Lab II - PGA block, Department of Chemical Engineering

Speaker: K Ronnie Rex

Biography of the Speaker: Ph. D. Research Scholar, Department of Civil Engineering, SRMIST

Guide: - Dr. Paromita Chakraborty, Environmental Science and Technology Laboratory, Department of Chemical Engineering, SRMIST



Title: **Fabrication of CuS Nanorods and Surface Modification with Chitosan and Folic Acid for Cancer Ablation Therapy and Antibacterial Applications**

Date/Time: 07.11.2022, 3:00 PM

Venue: Computer Lab II - PGA block, Department of Chemical Engineering

Speaker: **Sharmiladevi Ramamoorthy**

Biography of the Speaker: Ph. D. Research Scholar, Department of Physics and Nanotechnology, SRMIST

Guide: - Dr. S. Anandhakumar, Biomaterials Research Laboratory (BMRL), Department of Chemical Engineering, SRM IST

Title: **My research journey towards "Smart Waste Management"**

Date/Time: 19.11.2022, 3:00 PM

Venue: Computer Lab II - PGA block, Department of Chemical Engineering

Speaker: **Dr. S. Vishali**

Biography of the Speaker: Associate Professor, Department of Chemical Engineering, SRMIST

Message from the Alumni

Akshara Raghav
Assistant Manager
Hindustan Zinc Ltd.
B. Tech. (2015-2019)

Hello there!

I am **Akshara Raghav,** and I graduated from SRMIST in 2019. I had an exhilarating experience pursuing a Bachelor's Degree in Chemical Engineering. With the assistance of proficient faculty members who taught arduous subjects effortlessly, I developed a strong predilection for the course. I could approach the faculty without apprehensions to clear any doubts I had in a topic and due to this, I have performed well in academics. Budding chemical engineers are offered many opportunities to further their professional career in the placement season where several chemical manufacturing industries come to pick from the lot.

Because I was provided with a wholesome education during these 4 years, I could confidently sit for interviews and get recruited by a multinational conglomerate. I am forever indebted to the resources that this institution has provided, and I am sure that future batches will benefit from this experience.

Srishti Shaw
Process Engineer
Birla Carbon Pvt. Ltd.
B. Tech. (2017-2021)

My name is **Srishti Shaw,** a 2021 batch pass out graduate from the Department of Chemical Engineering, SRM Institute of Science and Technology, Kattankulathur. My journey of four years at SRM was quite like a roller coaster ride where I grew academically and prepared myself for the longer run. It is true that behind a student's success, there is always the hand of the professors with their prime motive of seeing us successful.

The Department of Chemical Engineering provides a lot of opportunities to the students to do something out of the box be it in terms of projects, internships, conferences or seminars. Not only does this department aim to provide quality education but also pushes us to participate in extracurricular activities like organizing department fests which I find quite thrilling. I would like to mention the excellent laboratory facilities offered to the students to carry out their research work. Regarding placements, most of the students passing out from SRM get multiple placement offers including offers from the top MNC and core companies. I feel obliged to all my faculty members and staff from the Department of Chemical Engineering for being so supportive and helpful.

Balayogesh R. B.
Production Engineer
Chemplast Sanmar Ltd.
B. Tech. (2017-2021)

I am **Balayogesh R B**, a 2021 graduate from the Department of Chemical Engineering, SRM Institute of Science and Technology, Kattankulathur. I feel grateful that I could share my experience here and I hope the students could resonate with me and make the best out of their 4 years. My journey at SRM from the very start had been a smooth ride. The Department of Chemical Engineering is one of the best departments among others as it not only provides us with internships and R&D opportunities, conferences , student exchange facilities but it also has well developed laboratories to carry out practical work where faculties help us to think out of the box and carry out our research.

The faculties were a huge part of my journey who not only helped me with my doubts but also pushed me to excel in all other areas, be it extra-curriculars, projects, seminars etc. Last but not the least, SRM not only helps us prepare for our post-graduation but also provide us with multiple placement opportunities. Students here get multiple offers from various well reputed companies. I will be forever grateful to SRM and my faculty members and staff who have supported and helped me to become who I am today.

The Chemical Engineering Team

Role of Chemical Engineers in Ushering Modern India

Dr. S. Prabhakar
Adjunct Professor, Chemical Engineering

Manufacturing industries play a key role towards the growth of any country with resources as evident from China's rise in the last three decades. If India has to prosper, the growth of manufacturing sector becomes critical. With fast changing global geo-political scenario, where the developed countries are looking for alternative sources of products, India has plenty of opportunities, on a platter. With recent discovery of lithium ores in J&K, it is prudent to fast-track our manufacturing sector.

Chemical engineers by their training are well placed to take the lead as they are suitably equipped during the graduating years in transforming resources to useful products for the society to meet the requirements of food, clothing, shelter, health and environment. By their choice, aptitude and personal environment, they can become entrepreneurs, technical leaders or researchers to contribute to the manufacturing sector.

Plenty of opportunities do exist in India as many challenges require smart solutions in agriculture, water, air, fuel, medical products and environment. Primarily the job of chemical engineers involve designing of the process for transforming raw materials to societally useful product and also to troubleshoot for the manufacturing of chemicals, fuels, foods, pharmaceuticals, etc. Further they are expected to optimize production with respect to cost.

Chemical engineers impact the manufacturing process in virtually all the dimensions, including economics of production, constant improvement of the product to keep pace with market demand, complying with safety norms and environmental regulation, etc. In fact, the chemical engineer is responsible for the functioning of the plant. Under Indian conditions, we have many challenges waiting to be solved by chemical engineers. In this respect the curriculum prepares him by providing domain information in various areas covering basic sciences, mathematics, core & digital engineering, economics and project management, besides the core chemical engineering comprising of thermodynamics, reaction engineering, heat & mass transfer, process instrumentation & control. In addition, they are exposed to the concepts of artificial intelligence and IOT.

The challenges that confront Indian agricultural sector include poor per capita yield of land resources, and the significant post- harvest loss of the produce. Chemical engineers can involve in producing effective organic fertilizers to boost the yield and also work towards the conversion of the perishables to value added products, without loss of time in nearby locations. Other areas include textiles and leather industries for which we have adequate natural resources where high export potential exists, water sector for desalination of seawater, brackish water as well as remediation of geo-genic and anthropogenic contaminants, development and manufacturing of different construction materials, the production of fuel from fossil and renewable resources, pharmaceuticals, heath care and life style products.

The IT sector no doubt provides cozy AC–PC job: however, climbing the ladder to exhibit one's talent is challenging as learning new concepts only would help rather than experience, whereas in core engineering areas constant improvement would pave the way for growth based on experience. Chemical engineer is a boss who identifies the target and implements it, where experience and awareness help a lot. Even though initial salary may not be high he becomes indispensable with experience and would be recognized for his contribution as can be seen from famous chemical engineers of India Prof. M. M. Sharma, erstwhile UDCT, Mumbai, Dr. H. N. Sethna, DAE, Architect of Nuclear Explosion and Atomic Power in India and Mr. Mukesh Ambani, the famous industrialist of Reliance Industries.

Chemical Engineering: Bridging the Gap Between Science and Industry

Sarthak Asthana
IV year, B. Tech. Chemical Engineering

Chemical Engineering is a branch of engineering that deals with the design, development, and operation of chemical processes and systems. It is an interdisciplinary field that applies principles from chemistry, physics, and mathematics to solve real-world problems related to the production and use of chemicals, fuels, pharmaceuticals, and materials. Chemical engineers play a critical role in bridging the gap between science and industry, as they are responsible for translating scientific discoveries into practical applications that can benefit society.

Chemical engineering has a wide range of applications in various industries, including petrochemicals, energy, food and beverage, pharmaceuticals, and materials science. In the petrochemical industry, for example, chemical engineers are responsible for designing and optimizing processes for the production of chemicals, fuels, and plastics from petroleum-based feedstocks. In the energy industry, they work on developing technologies for the production and storage of renewable energy sources such as solar and wind power. In the food and beverage industry, they are involved in the development of new food products and the optimization of food processing operations to ensure food safety and quality. In the pharmaceutical industry, chemical engineers are involved in the design and optimization of drug manufacturing processes, as well as the development of drug delivery systems. In materials science, they are involved in the development of new materials with improved properties, such as strength, durability, and flexibility.

One of the key challenges that chemical engineers face is the need to balance economic, environmental, and social considerations when designing chemical processes and systems. This requires a deep understanding of the underlying chemistry and physics of the processes involved, as well as an awareness of the potential environmental and social impacts of these processes. Chemical engineers must also be able to work effectively with other professionals, including chemists, physicists, biologists, and environmental scientists, to ensure that the processes and systems they develop are safe, efficient, and sustainable.

Another important aspect of chemical engineering is the need to stay abreast of new developments in science and technology. This requires a commitment to lifelong learning and professional development, as well as willingness to adapt to changing industry needs and trends. Chemical engineers must be able to work in a dynamic and rapidly changing environment, where new technologies and processes are constantly being developed and refined.

In conclusion, chemical engineering is a critical discipline that plays a vital role in the development of new technologies and processes that benefit society. Chemical engineers are responsible for bridging the gap between scientific research and industrial applications, and must be able to balance economic, environmental, and social considerations when designing chemical processes and systems. They must also stay up-to-date with the latest scientific and technological developments, and be able to work effectively with other professionals to ensure that their work is safe, efficient, and sustainable.

There have been many recent advances in chemical engineering, ranging from the development of new materials and processes to improvements in energy efficiency and environmental sustainability. Here are a few notable examples:

1. Carbon capture and utilization: Chemical engineers have been working to develop new technologies to capture and utilize carbon dioxide emissions from industrial processes. This includes developing new materials and processes for carbon capture, as well as finding ways to use captured carbon dioxide as a feedstock for the production of chemicals and fuels.

2. Nanotechnology: Chemical engineers are playing a key role in the development of nanotechnology, which involves the design and manipulation of materials at the nanoscale level. This has led to the development of new materials with unique properties, such as increased strength, flexibility, and conductivity.

3. Biotechnology: Advances in biotechnology have opened up new opportunities for chemical engineers, particularly in the areas of biopharmaceuticals and biofuels. Chemical engineers are involved in the design and optimization of bioreactors for the production of these products, as well as the development of new technologies for the purification and separation of biomolecules.

4. 3D printing: Chemical engineers are using 3D printing technology to develop new materials and structures with precise geometries and properties. This has applications in a wide range of industries, including aerospace, automotive, and medical devices.

5. Process intensification: Chemical engineers are developing new processes that are more efficient, using less energy and resources to produce the same amount of product. This includes the use of novel reactors, such as microreactors and membrane reactors, as well as the development of new separation and purification technologies.

6. Machine learning and artificial intelligence: Chemical engineers are exploring the use of machine learning and artificial intelligence to improve the design and operation of chemical processes. This includes the development of predictive models for process optimization, as well as the use of autonomous systems for process control and monitoring.

Overall, these recent advances in chemical engineering are helping to drive innovation and improve the efficiency and sustainability of chemical processes, while also opening up new opportunities for the development of new products and materials.

Without chemical engineers, the world would look very different. Many of the products and processes that we rely on in our daily lives would not be possible, or at least not as efficient, safe, or sustainable. For example:

1. The production of essential chemicals and materials, such as medicines, plastics, and construction materials, would be more challenging, inefficient, and expensive.

2. The design and optimization of industrial processes, such as refining petroleum, producing energy, or purifying water, would be less effective, leading to increased costs, lower quality, and higher environmental impact.

3. The development of new technologies and solutions to address environmental challenges, such as climate change or waste management, would be slower and less effective, putting at risk the sustainability and resilience of our planet.

In summary, the absence of chemical engineers would have a significant impact on our economy, health, and environment, affecting the quality of life of many people and limiting our ability to progress and innovate.

The world is heavily dependent on chemical engineers for the development and production of many essential products and processes. Chemical engineers play a critical role in industries such as energy, food, pharmaceuticals, materials, and environmental protection. They design and optimize processes for the production of fuels, chemicals, plastics, and other materials that are used in countless products, ranging from medicines and electronics to vehicles and construction materials. Chemical engineers also develop innovative solutions to address environmental challenges, such as reducing greenhouse gas emissions and managing waste streams. Without the contributions of chemical engineers, many of the products and processes that we rely on for our daily lives would not be possible or sustainable.

Chemical engineers are unique in their ability to apply principles of chemistry, physics, and mathematics to design and optimize processes that transform raw materials into valuable products. They have a deep understanding of chemical reactions, thermodynamics, fluid mechanics, and mass and heat transfer, which they use to develop sustainable solutions for a wide range of industries such as pharmaceuticals, energy, food, and materials. Their expertise allows them to tackle complex challenges related to process efficiency, environmental impact, and product quality, making them valuable contributors to society's progress and well-being.

Life as a chemical engineer can be varied and rewarding. Chemical engineers work in a wide range of industries, such as energy, food, pharmaceuticals, materials, and environmental protection, and can hold a variety of roles within these industries.

A typical day for a chemical engineer may involve:

1. Conducting research and development to optimize processes and products, often in a team setting.
2. Designing and analysing experiments, often using computer simulations and mathematical models.
3. Troubleshooting and problem-solving to address issues related to process efficiency, product quality, or environmental impact.
4. Communicating with colleagues, clients, and stakeholders to present results, propose solutions, or coordinate activities.
5. Ensuring compliance with safety, health, and environmental regulations, often working closely with regulatory agencies.

Chemical engineers may also have opportunities to travel for work, attend conferences and training programs, or collaborate with experts from different fields.

Overall, being a chemical engineer requires a combination of technical expertise, analytical skills, and creativity, as well as good communication and teamwork abilities. Chemical engineers have the opportunity to work on exciting projects that can have a significant impact on society and the environment, making it a fulfilling and challenging career path.

Why Chemical Engineering?

Afeez Ahamed A.
IV year, B. Tech. Chemical Engineering

One of the most frequent question a chemical engineering student encounters from society is "Why chemical engineering?" The answer, however, varies from person to person. The melting chunks of ice in the Arctic and the enormous heaps of plastics floating in the Bay of Bengal served as my inspiration for enrolling in Chemical Engineering. We, as humans, are causing havoc on the environment. Thus, it is our responsibility to do our share to defend it.
Some of today's critical environmental concerns are addressed by chemical engineers. Providing solutions in the spaces of energy, environment, and sustainability, inevitably combines the physical, molecular, chemical, and materials sciences with a grasp of Process engineering.

Rising sea levels and global temperatures are some of the most pressing issues of our time, and addressing them requires urgent and collective action. To achieve this, we must transition to more sustainable and low-carbon energy sources and technologies while also promoting energy efficiency and conservation. This transformation will require a coordinated effort across industries, governments, and individuals, including investment in research, policy, and education. Achieving net-zero carbon emissions by 2050, as outlined in the Paris Agreement, is a critical milestone towards a more sustainable and resilient future for all.

"The climatic crisis is both the easiest and the hardest issue we have ever faced. The easiest because we know what we must do. We must stop the emissions of greenhouse gases. The hardest because our current economics are still totally dependent on burning fossil fuels, and thereby destroying ecosystems in order to create everlasting economic growth"

-Greta Thunburg (Swedish climate activist)

As a ChemE student, I am driven to apply my knowledge and skills to develop innovative solutions that promote sustainability and minimize our impact on the environment. By designing and optimizing processes that are more efficient, economical, and environmentally friendly, chemical engineers can help to create a more sustainable future for all. It is not only our responsibility but also an opportunity to make a positive difference in the world and leave a lasting legacy for future generations.

Auf Wiedersehen!

History of Chemical Engineering

Praveena M.
II year B. Tech., Chemical Engineering

> Chemical engineering more than any other, may be called the engineering of the future. It is the result of an evolution in which most of the other branches have played a part... The chemical engineer stands today on the threshold of a vast virgin realm; in it lie the secrets of life and prosperity for mankind in the future of the world.
>
> -John Hays Hammond

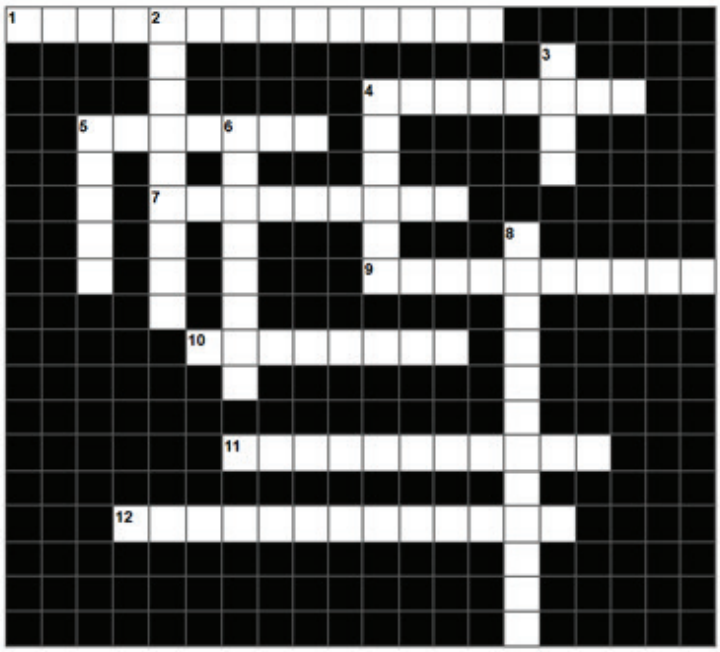
Chemical engineering is a discipline that was developed out of those practicing "industrial chemistry" in the late 19th century. Before the Industrial Revolution (18th century), industrial chemicals and other consumer products such as soap were mainly produced through batch processing. Batch production is a method of manufacturing where the products are made as specified groups or amounts, within a time frame. A batch can go through a series of steps in a large manufacturing process to make the final desired product. Batch processing is labour-intensive and individuals mix predetermined amounts of ingredients in a vessel, heat, cool or pressurize the mixture for a predetermined length of time. The product may then be isolated, purified and tested to achieve a saleable product. Batch processes are still performed today on higher value products, such as pharmaceutical intermediates, speciality and formulated products such as perfumes and paints, or in food manufacture such as pure maple syrups, where a profit can still be made despite batch methods being slower and inefficient in terms of labour and equipment usage. Due to the application of Chemical Engineering techniques during manufacturing process development, larger volume chemicals are now produced through continuous "assembly line" chemical processes.

The Industrial Revolution was when a shift from batch to more continuous processing began to occur. Today commodity chemicals and petrochemicals are predominantly made using continuous manufacturing processes whereas speciality chemicals, fine chemicals and pharmaceuticals aremade using batch processes. Industrial chemistry was being practiced in the 1800s, and its study at British universities began with the publication by Friedrich Ludwig Knapp, Edmund Ronald and Thomas Richardson of the important book Chemical Technology in 1848. By the 1880s the engineering elements required to control chemical processes were being recognized as a distinct professional activity. Chemical engineering was first established as a profession in the United Kingdom after the first chemical engineering course was given at the University of Manchester in 1887 by George E. Davis in the form of twelve lectures covering various aspects of industrial chemical practice. As a consequence, George E. Davis is regarded as the father of chemical engineering and world's first chemical engineer. Today, chemical engineering is a highly regarded profession. Chemical engineers with experience can become licensed Professional Engineers in the United States, aided by the National Society of Professional Engineers, or gain "Chartered" chemical-engineer status through the UK-based Institution of Chemical Engineers.

In 1880, the first attempt was made to form a Society of Chemical Engineers in London. This eventually resulted in the formation of the Society of Chemical Industry in 1881. The American Institute of Chemical Engineers (AIChE) was founded in 1908, and the UK Institution of Chemical Engineers (IChemE) in 1922. These both now have substantial international membership. Some other countries now have chemical engineering societies or sections within chemical or engineering societies, but the AIChE, IChemE and IiChE remain the major ones in numbers and international spread: they are both open to suitably qualified professionals or students of chemical engineering anywhere in the world.

ChemE Crossword

Dr. K. Deepa
Assistant Professor, Chemical Engineering



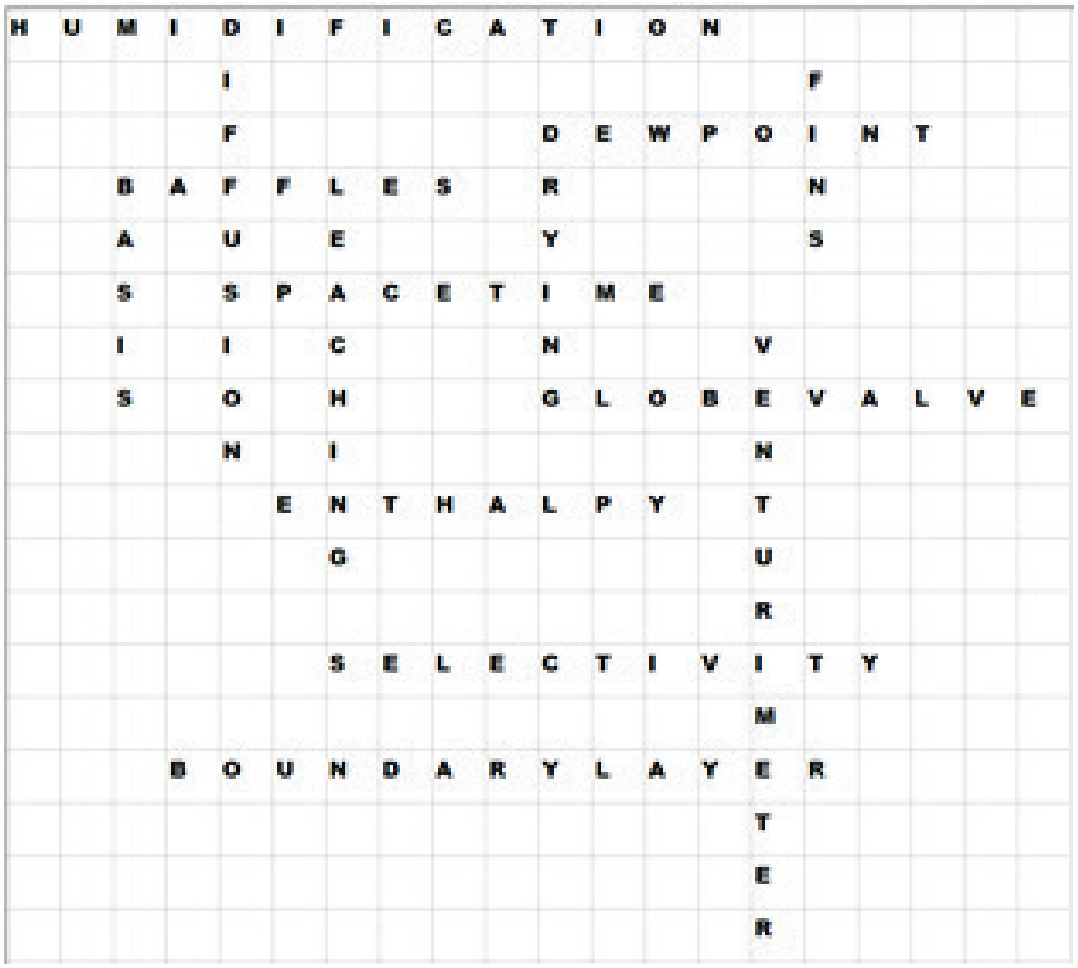
Across:

1 Process of increasing the moisture content of air
4 The temperature to which air must be cooled to become saturated with water vapor
5 Prevent vortex formation and improve overall mixing in a reactor
7 Performance measure of flow reactors
9 A spherical flow regulator in pipelines
10 Heat content of a system
11 Ratio of desired product to undesired product formed in a chemical reaction
12 The thin layer of fluid in the immediate vicinity of a bounding surface formed by the fluid flow

Down:

2 Transport of material due to concentration gradients
3 Used to increase the rate of heat transfer
4 Both a heat transfer and mass transfer process
5 First step in solving a process calculations problem
6 Solid-liquid extraction
8 A flow measurement instrument

Solution to crossword



Women in Chemical Engineering

As a tribute to the undaunted role of women in the manufacturing businesses, we have listed a few accomplished women CEOs/founders of famous chemical industries.

Indra Nooyi, Chairman, PepsiCo
Indra Nooyi is chairman and former chief executive officer of PepsiCo. She has directed the company's global strategy for more than a decade and led its restructuring, including the divestiture of its restaurants into the successful YUM! Brands, Inc.

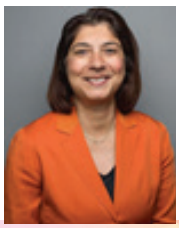
Linda Rendle, CEO, Clorox
Linda Rendle started her role as CEO of the Clorox Company. Over the years, she has held various senior leadership roles. Before becoming CEO, she functioned as president of the company, overseeing important global functions.

Ilham Kadri, CEO, Solvay
Ilham Kadri is CEO and President of the Executive Committee of Solvay, a materials, chemicals and solutions company which through its purpose, values and science contributes to protecting the climate, preserving resources and fostering a better life.

Revathi Advaithi, CEO, Flex
Advaithi joined Flex, previously known as Flextronics as its CEO in 2019. She is known for being a quick decision-maker. Advaithi also serves as an independent director for the board of directors of Uber and Catalyst. An advocate for women in STEM (science, technology, engineering, and mathematics) fields, Advaithi is a member of the MIT Presidential CEO Advisory Board.

Julie Bartholomew, CEO, IMX labs Inc. Bartholomew is the founder, CEO, and global innovations officer for IMX Labs, Inc. IMX Labs, Inc. is an innovative beauty tech company that specializes in cosmetic customization. In fact, this company boasts one of the world's largest global patent portfolios.

Lisa Lunsford, CEO, GS3
Lunsford is a co-founder and the CEO of Global Strategic Supply Solutions LLC, also known as GS3. GS3 engineers manufacture, assemble packages and ship precise machine parts to a variety of industries, including automotive and healthcare.



Reshma Kewalramani CEO, Vertex Pharmaceuticals
Kewalramani became the first female CEO of a large US biotech firm Vertex Pharmaceuticals. She was made the President and CEO in 2020-21. She was honoured with the TiE Boston Healthcare Leadership Award. She has also been named one of Boston Business Journal's Power 50.

திருக்குறள்

குடிபுறங் காத்தோம்பிக் குற்றம் கடிதல்
வடுவன்று வேந்தன் தொழில்.

குறள் 549
பால்: பொருட்பால்
அதிகாரம்/Chapter: செங்கோன்மை / The Right Sceptre

பொருள்
குடிகளைப் பிறர் வருந்தாமல் காத்து, தானும் வருந்தாமல் காப்பாற்றி, அவற்களுடைய குற்றங்களைத் தக்க தண்டனையால் ஒழித்தல், அரசனுடைய தொழில் பழி அன்று.

Transliteration

Kudipurang kaaththoambi kutram kadithal
vaduvandru vendhan thozhil

Translation

To save his subjects and chide the wrong is the flawless duty of a king.

Meaning

In guarding his subjects from others, and in preserving them himself; to punish crime is not a fault in a king, but a duty.