



MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

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TEMPUS

CHEMICAL ENGINEERING DEPARTMENT NEWSLETTER



- **Recent Events**
- **Faculty & Student Achievements**
- **Department Documentary**



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CATCH THE PREVIOUS EDITION OF TEMPUS [HERE!](#)

From the HOD's Desk



Dear Reader,

Warm Greetings to You!

We are back with the second issue of our department newsletter **TEMPUS**.

The inaugural issue released last July was received very well by all our readers. We thank the readers for their encouragement and feedback.

I congratulate the editorial board members for their immense efforts to bring out this edition.

My sincere thanks to all the people who contributed to this issue and brought it to a neat and tidy form with a lot of valued content.

You'll find inside the remarkable achievements of the faculty, students and alumni. Hearty congratulations to each one of them. These stories will inspire all of us to perform to our best capacity.

Best wishes to all. Take care.

**Dr. K Balakrishna Prabhu, Professor and Head,
Department of Chemical Engineering, MIT, Manipal.**

Vision and Mission of the Department

Vision

To be the department that fosters excellence in education, research and innovation in Chemical Engineering and emerging interdisciplinary fields.

Mission

- To provide quality education that prepares the graduates for leading roles in their chosen career and life-long learning.
- To develop technology through excellence in research, in conjunction with the technical education that is recognized by the peers in the profession in the emerging fields of Chemical, Biochemical, Energy, Environmental engineering, and Material Science.
- To achieve technical excellence through industry-institute interactions.
- To produce graduates who are able to perform in multi-disciplinary teams and demonstrate superior team leadership.

Department Documentary

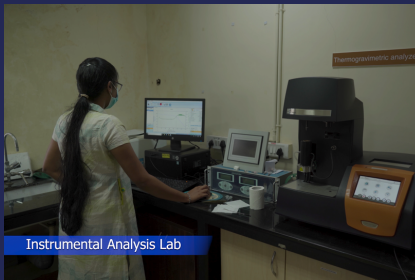


Cinematographer:
Sam Jose Thomas
B.Tech Batch of 2022
Media Technology



Director & Editor:
A Varun Menon
B.Tech Batch of 2022
Chemical Engineering

Watch the documentary [here!](#)



Instrumental Analysis Lab



Dr. Balakrishna Prabhu
HOD



Process Control Lab



Avryl Machado & Aneesh Ramanathan
Btech(7th sem) students



fer Lab



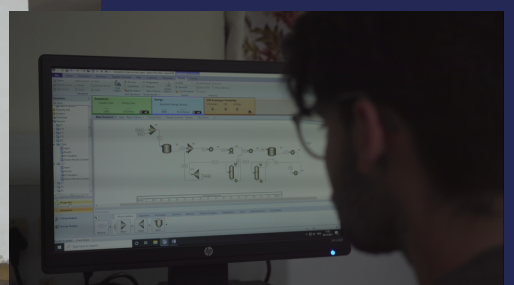
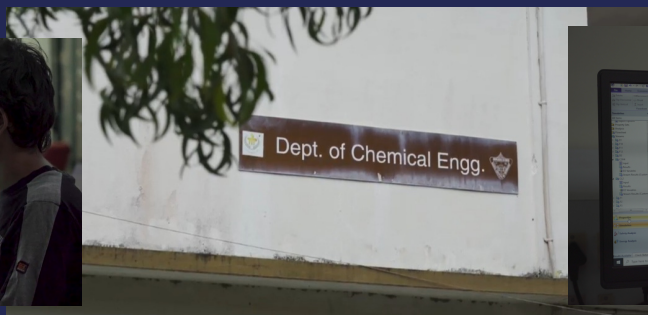
Shraddha Pai & Ranyashree M S
Ph.D. students



Technology Lab



Gaurav Agrawal & Koena Maji
Btech(5th sem) students



The background is a light blue field filled with a repeating pattern of white line-art icons. These icons represent various scientific concepts: laboratory glassware (Erlenmeyer flasks, test tubes, beakers, a balance scale, a Bunsen burner), molecular structures (benzene rings, complex organic molecules, a DNA helix), and biological elements (microscopic organisms, a petri dish with colonies, a hand holding a petri dish).

From the Students

CRISPR/Cas9: Technology that can Alter Life

-By Amrita Dam, 3rd year Chemical Engineering

Implications of Cas9/CRISPR Technology

This was the scientific discovery that won the Nobel prize in Chemistry 2020. It was jointly awarded to Emmanuelle Charpentier and Jennifer A. Doudna. Simply put, they discovered **the ultimate genetic scissors, i.e., a DNA sequence that has the ability to cut/ splice genetic material at any controlled site of choice with extremely high precision.** It has shown promising results when tested on microorganisms, plant and animal cells, including humans. **The implications of this discovery are that, we'll now be able to essentially cure inheritable diseases** like blindness, sickle cell anaemia, even aid in cancer therapy. While this comes with an assortment of ethical dilemmas and questions, it still remains one of the greatest discoveries in Genetics. As the Royal Swedish Academy of Sciences phrased it, *"It is now possible to change the code of life over the course of a few weeks."*

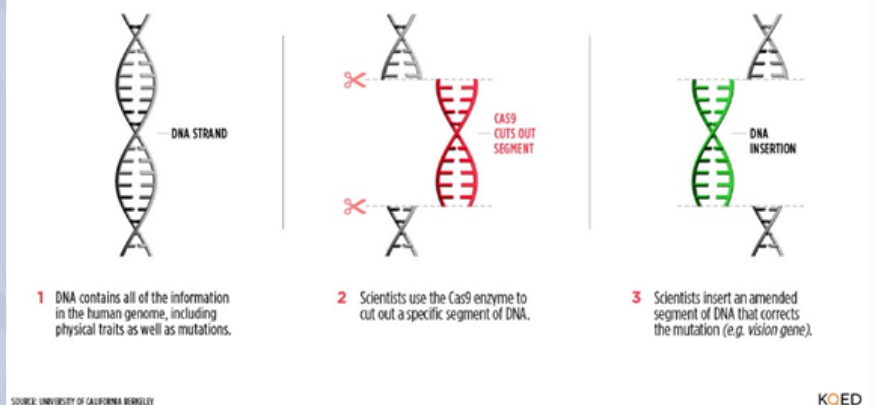
What is CRISPR/Cas9 Technology

Let's begin with the term CRISPR, it's an acronym for Clustered Regularly Interspaced Short Palindromic Repeats. In the world of genetics, this refers to a short strand of genetic material, DNA which is highly conservative in structure and commonly found only in prokaryotes. CRISPR/CAS9 is a molecular complex found in Prokaryotes/ bacterial cells which do not have a nuclear membrane for defence against pathogens.

Clinically tested to cure blindness and sickle cell anemia

EDITING HUMAN DNA

The gene-editing tool CRISPR/Cas9 can target and modify DNA with a great deal of accuracy, changing the way we think about treating diseases.



These types of cells fight off pathogens such as bacteriophages and plasmids, by cutting up their genetic material into non-functional and non-infective sequences with the help of CRISPR/CAS9.

By isolating and programming the immune defence in prokaryotes, it can be applied in eukaryotic cells as molecular scissors to deactivate possible mutated parts of the DNA and add desired genes etc.

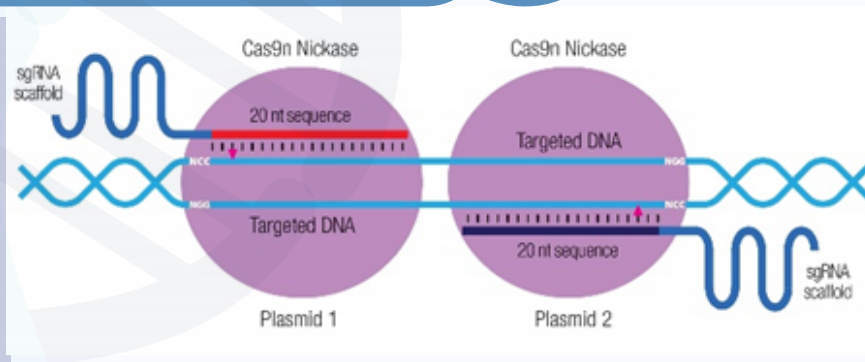
Steps towards Discovery

While the functioning and applications of CRISPR was established by 2012 via various research works. It was only in 2002 Jensen and associates found the CRISPR-associated (Cas) gene, Cas9 was a relatively new discovery. This gene was also found only in prokaryotes and always closely positioned to CRISPR genes, and the protein synthesised by them indicated that these had a big role in DNA metabolism and gene expression. Research in 2007 proved that the non-repetitive part of the CRISPR sequence contained genetic material from previous pathogen attacks, this helps the cells defend themselves using a method similar to RNA Interference.

During a study of *S. pyogenes* long RNA, it was noted that CRISPR was needed to identify a viral DNA and that Cas9 was the bacterial scissor that cut off the DNA molecule, but this only worked with the addition of tracrRNA molecule. Indicating that tracrRNA has a crucial role to play in bacterial defense.

They selected 5 sites of cleaving and altered the CRISPR RNA accordingly, the guide molecule carried Cas9 protein to the site and successfully 5 incisions were made at the identified sites!

Thus, researchers Emmanuelle Charpentier and Jennifer A. Doudna decided to create a new single molecular complex by combining crRNA (CRISPR RNA) and tracrRNA as a kind of "guide RNA molecule" and see



whether it could be used as a general-purpose genetic tool that could cleave any genetic element of choice not just that of viral DNA. By altering the CRISPR sequence depending upon the genetic code of the site to be cut, the guide molecule led the Cas9 gene to the site of incision and the DNA was cleaved at that specific point.

Therefore, a Nobel Prize-winning discovery was made, a discovery that can vastly alter the quality of human life in the coming years.

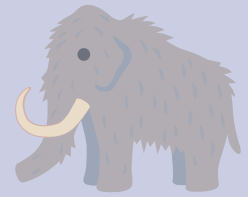
References:

1. [*The Nobel Prize in Chemistry 2020*](#) | [*The Nobel Prize*](#)
2. [*Nobel Prize in Chemistry: A magical genetic tool*](#) | [*Frontline*](#)

A Mammoth Solution

-By Devangshi Debraj, 3rd year Chemical Engineering

**"Show them respect. The elephants created this jungle.
They made all that belongs."
—Bagheera in The Jungle Book by Rudyard Kipling.**



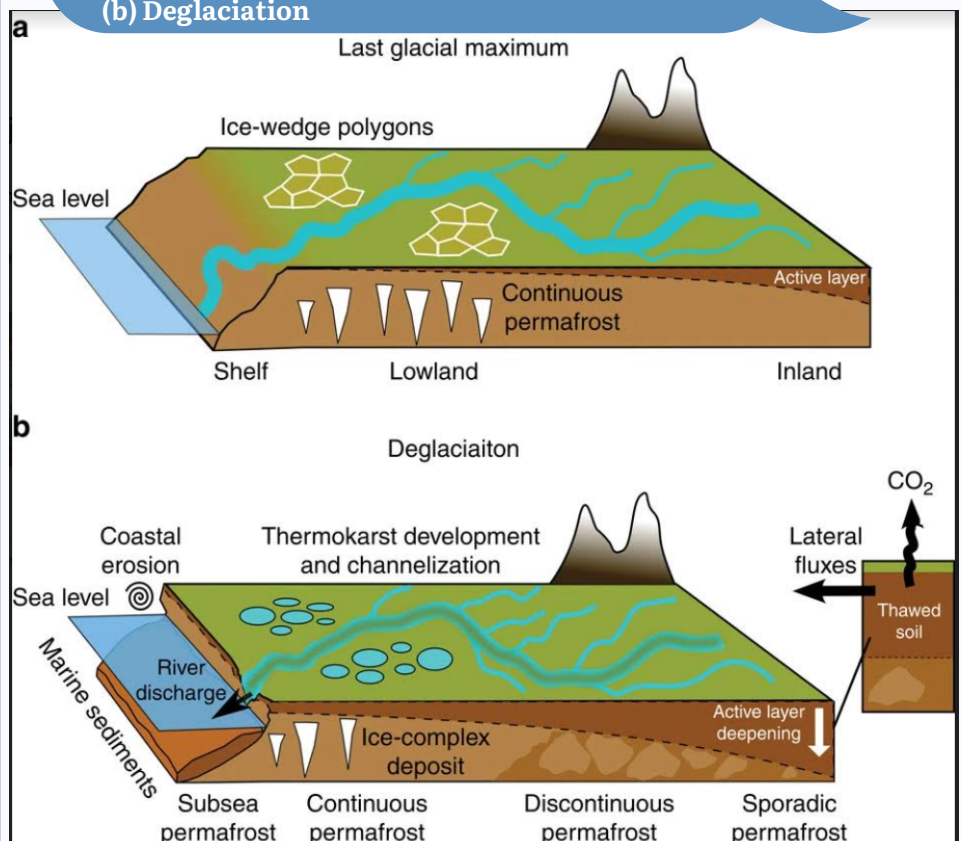
Elephants are a keystone species, essential to the ecosystem they inhabit. It is no wonder, therefore, that their ancestor, **the woolly mammoth, could quite possibly be the key to the ever-present problem of climate change** that threatens every biome.

As the atmosphere warms with each passing year, the melting of the Arctic Tundra permafrost becomes a very real threat. Recent studies and hypotheses have found that **permafrost carbon accumulated during the last glaciation may be a huge source of atmospheric CO₂ rise during post-glacial warming. Furthermore, if the microorganisms trapped in the ice are exposed, their metabolic activity would also contribute to this CO₂ rise.**

Tech entrepreneur Ben Lamm and Harvard geneticist George Church have joined hands to create and fund the start-up, Colossal, in a **unique attempt at CO₂ sequestration. Its ambitious goal is the de-extinction of the woolly mammoth—to genetically engineer an Asian elephant calf to withstand the bitterness of the Arctic.**

Delving into the geological history of our planet reveals a mammoth steppe, the Earth's largest biome during the Last Glacial Maximum. It stretched from Spain eastward to Eurasia, northern Siberia and Canada, and from the Arctic islands, southward to China. This region was vastly a grassland inhabited by giant herbivores that maintained the ecosystem during the Pleistocene Epoch.

Continuous permafrost, carbon fluxes, and active soil layer during:
(a) Last Glacial Maximum
(b) Deglaciation



The therians roamed the steppes, constantly trampling mosses and shrubs, uprooting trees, and disrupting the landscape. They acted as natural geoengineers by keeping the ecosystem productive with grasses, herbs, and no trees. Grass absorbs less heat than trees. Moreover, trampling through and scattering the insulating snow cover exposes the permafrost to the bitter Arctic winters. These effects combine to keep the microorganisms, carbon pools and greenhouse gases on ice for longer.



Pleistocene Park is a natural reserve in northeastern Siberia that aims to recreate the mammoth steppe that flourished during the last glacial period [6]. Its main objective is to study the effects of local flora, fauna, and their interactions on changes in the climate and ecosystem. It is based on the idea that a shift in biome from tundra to grassland will increase the ratio of the energy emitted to the energy absorbed, leading to a decrease in permafrost thawing and subsequently less emission of greenhouse gases.

With advancements in CRISPR technology, research from Pleistocene Park, sequencing of the woolly mammoth genome, and the current pressing need for the mitigation of global warming and climate change, perhaps mammoths will be to an Arctic grassland what elephants are to Kipling's jungles.

References:

1. [*World Wild Life*](#)
2. [*Massive remobilization of permafrost carbon during post-glacial warming*](#)
3. [*Woolly Mammoth De-extinction Project & Process | Colossal*](#)
4. [*Last Glacial Maximum- An Overview*](#)
5. [*Mammoth steppe: A high-productivity phenomenon*](#)
6. [*MAMMOTH on Vimeo*](#)

IChE Events

Student Chapter of the Chemical Engineering Department

TAKING THE OFF-BEAT PATH

Date of event: 9th July 2021

An interactive session with Mr. Dhairya Dand about his journey from an engineer to an innovator.

Known as an advisor and speaker, he walked us through his personal experience exploring and inventing products in AI, AR and wearable effort.

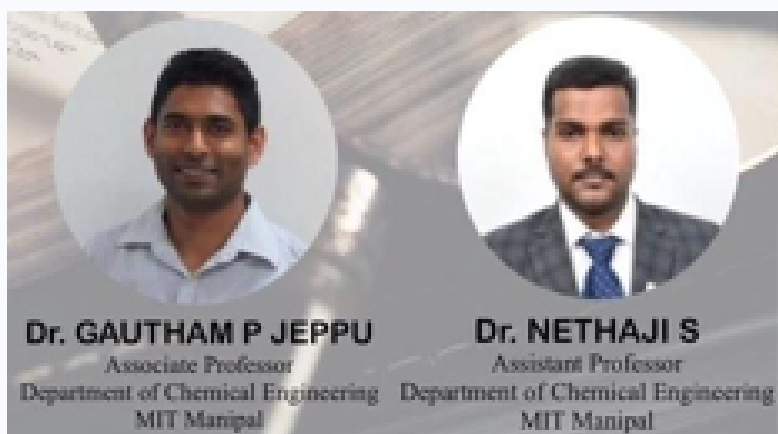


DHAIRYA DAND

Received Presidential Fellowship from MIT Massachusetts Led Amazon's Concept Labs efforts in designing for AI and Alexa
Key inventor at MIT Media Lab for AL AR & wearable effort
Awarded two Forbes 30 Under 30. WIRED Innovation Fellow, Globe's Top 25 Innovators list & many more.

LITERATURE REVIEW AND REPORT WRITING

Date of event: 31st July 2021



A detailed session on literature review and report writing was conducted with the support of the Department of Chemical Engineering, MIT Manipal.

Speakers: Dr. Gautham P Jeppu
Dr. Nethaji S

HIGHER STUDIES AND RESEARCH AT CRANFIELD UNIVERSITY

Date of event: 19th August 2021

Dr. Kumar Patchigolla, the MSc Course Director for Advanced Heat Engineering of Cranfield University, presented the scope of education for chemical engineers in UK. Further, he elaborated on the plethora of research opportunities open to chemical engineering students aspiring to pursue a career in the domain of Heat Engineering and Carbon, Climate and Risk.



DR. KUMAR PATCHIGOLLA

A WINDOW INTO EDUCATION ABROAD

Date of event: 20th August 2021

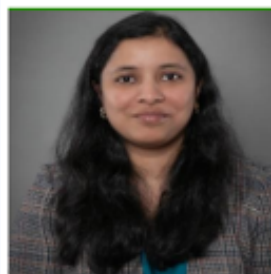
Three alumni of the Department held a lively and interactive webinar about different education paths that could follow after BTech.

Work after BTech followed by Masters in the Chemical domain, pursue an MBA or a PhD after BTech? The speakers advised and gave tips on everything required mainly to study in the States.



Bharatram Muralidharan

Strategy Consultant -Deloitte Consulting
M.S. Chemical - Rutgers



Oishi Sanyal

Assistant Professor -West Virginia University
PhD Chemical - Michigan State

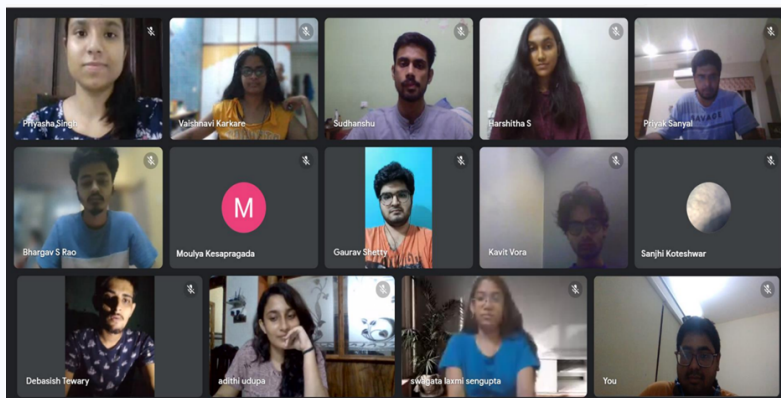


Manoj Selvaraj

Engagement Manager -Stage Growth Partners
MBA - Johns Hopkins

AQUA WEEK 2021

Date of event: 24th-28th August 2021



IChE Manipal conducted a 4-day long series of events whose themes revolved around those of World Water Week 2021.

The events included an online quiz, exposition, discussion, paper presentation, and a webinar. The events were promoted on Dare2Compete allowing students from across the country to participate.

ROLE OF CHEMICAL ENGINEERS IN PHARMACEUTICAL INDUSTRIES

Date of Event: 9th September 2021



A Guest Talk by Dr Sunil Bawane emphasizing the significance of pharmaceuticals in the world.

Dr Sunil Bawane is the President of Manufacturing at Amoli Organics, Gujarat.

CHEMIGNITE-2K21

THEME: THE EVER CHANGING WORLD OF ENERGY

Date of Event: 27th November 2021

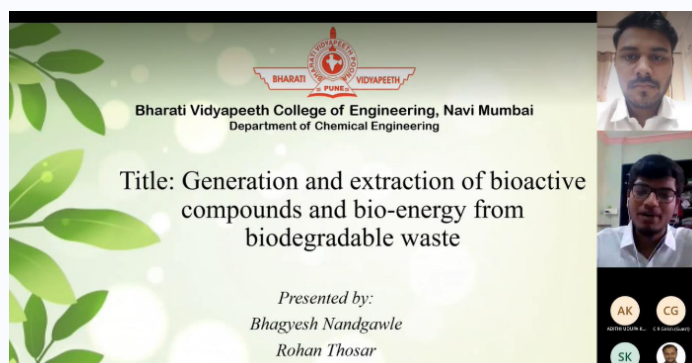
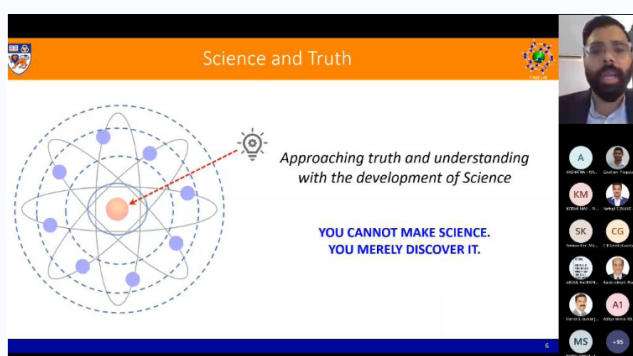
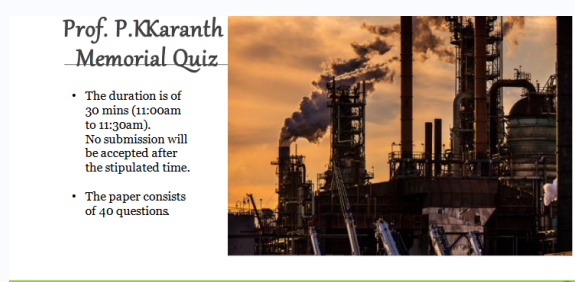
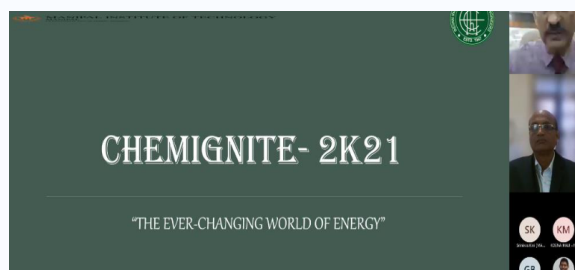
Chemignite is an annual national symposium conducted by the Institute of Chemical Engineers (IChE) Student Chapter, MIT, Manipal and the Department of Chemical Engineering MIT, Manipal.

The theme for the Chemignite-2K21 symposium was "The Ever-Changing world of Energy". The theme aimed to explore the major developments and prospective breakthroughs in the ever-changing world of energy that could have a major impact on the Energy sector of India.

India is a major player in the energy sector of the world, having committed to accounting for 40% energy demand from renewables and has encouraged major organizations for the same. With this goal in mind this theme was finalized for CHEMIGNITE-2K21. Students from 15 different colleges across the country participated in the technical events.

Dr. Gaurav Bhattacharjee, research fellow at NUS, Singapore and Dr. Damaraju Parvatulu, Project Manager of Hydrogen Project, ONGC Energy Centre, Mumbai gave their keynote addresses for the day. Dr Gaurav Bhattacharjee elaborated on the Philosophy of Scientific Research and the Case for Solidified Natural Gas (SNG), while Dr. Damaraju Parvatulu gave a presentation titled "The Imminent Changes in World Energy Scenario: Challenges and Opportunities".

The annual Prof. P K Karanth Memorial Quiz was held for the students of Chemical Engineering Department from MIT, NIT Surathkal and participants of Chemignite. 15 participating teams presented their research/review papers Technical Paper Presentations.

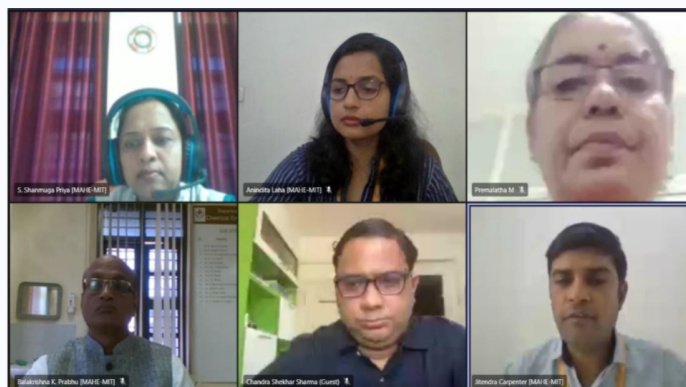


DEPARTMENT EVENTS

ATAL FDP

Date of Event: 25th-29th October 2021

A 5 days ATAL sponsored online FDP was conducted from 25th to 29th Oct 2021 titled “**Recent Advancements in Sustainable Energy Storage and Conversion**”. Around 128 participants from different parts of the country participated. The programme comprised of 13 technical lectures and 1 yoga lecture. The organizing committee had Dr S Shanmuga Priya, Associate Professor-Senior Scale as the coordinator and Dr Anindita Laha, Assistant Professor as the co-coordinator.

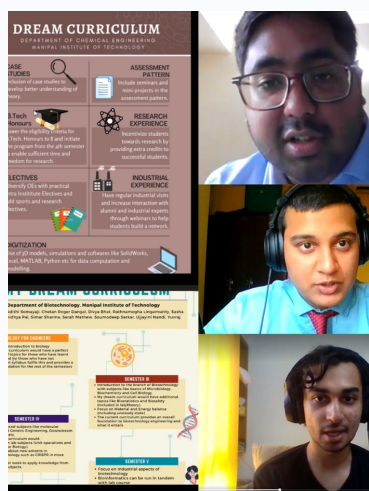
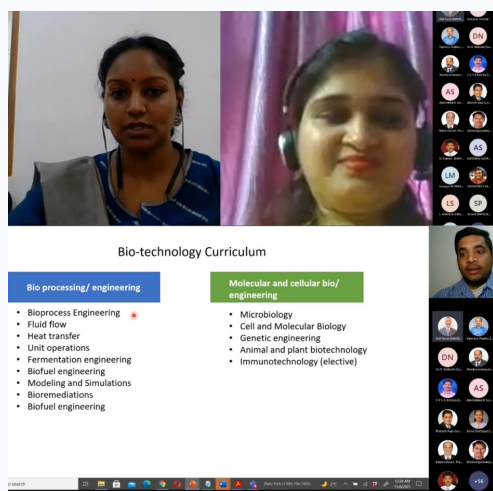
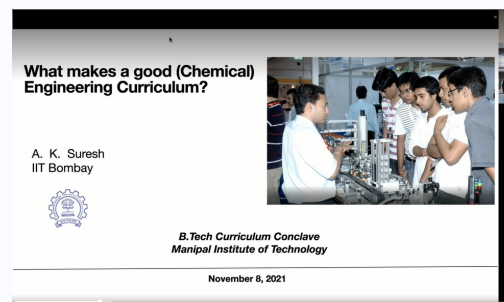
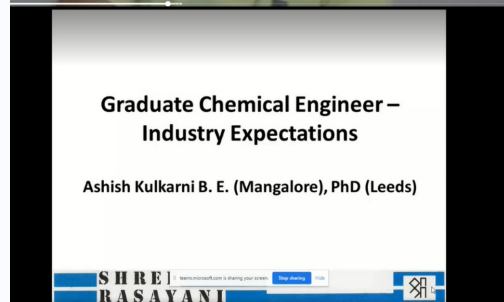


DEPARTMENT EVENTS

CURRICULUM CONCLAVE

Date of Event: 8th November 2021

A one day curriculum conclave was conducted on 8th November 2021 to discuss proposals for revisions to the curriculum for the year 2022 in the B.Tech. programmes of Chemical Engineering and Biotechnology. The online event was graced by experts from industry and academia who provided their insights on curriculum and feedback on the revisions proposed- namely Dr. Ashish Kulkarni, CEO, Shree Rasayani, Nashik, Dr. Nellaiah, Head, Research and Development, BioZEEN, Bengaluru, Prof. A K Suresh, Professor in Chemical Engineering, Institute Chair Professor, Indian Institute of Technology, Bombay. Dr. K. Ramnarayan, Chairperson, MU, Jaipur and Former Vice Chancellor, MAHE spoke about eight paradigm shifts or advancements in pedagogy of the future in his inaugural address.



The event had lectures on the following topics: "Engineering Curriculum- an overview" and "Graduate Engineer- Industry Expectations" followed by presentations by our alumni, students and faculty members. The afternoon session had group discussions on varied topics relevant to curriculum revision followed by a presentation on the tentative curriculum for the year 2022.

Faculty achievements



Dr Raja S, Associate Professor (Senior Scale) figured in the Top 2 Percentile researchers in the world, by science-wide author databases of standardized citation indicators released by Stanford University, USA on 19 October 2021.

The exhaustive list has 1,00,000 persons with nearly 2000 Indians in it. The standardized citation indicators include the number of citations, H -Index, co-authorship, and a composite indicator. The results were published in PloS Biology recently and they have been classified into 22 scientific fields and 176 sub-fields in the report. This research and database have been published by Elsevier titled “Updated Science-wide Author Databases of Standardized Citation Indicators”, that can be seen [here](#).

His achievement was published in the e-newspaper of Business line on campus by the Hindu Business Line [here](#),

His research accomplishments can be found in the following hyperlinks at [Google Scholar](#), [Scopus](#), and [Research Gate](#)

Faculty achievements



Dr. S Shanmuga Priya, Associate Professor (Senior Scale) and her team have published a paper in Q2 journal “Sustainable Chemistry and Pharmacy” titled “CO₂ to Green Fuel: Photocatalytic process optimization study”. The work concentrates on process modeling and simulation of CO₂ conversion to methanol using Cu/TiO₂ photocatalyst. Design expert 11.1.2.0. Response Surface Methodology was implemented to study the effect of process parameters, including temperature, pressure, and feed flow rate. Her accomplishments can be accessed [here](#).



Dr. Harshini, Associate Professor and her team have published two articles in the Korean Journal of Chemical Engineering- “The catalytic activity of Ce-Hf, Ce-Hf-Mg mixed oxides and RuO₂/HfO₂ deposited on CeO₂: Role of superoxide/peroxide in soot oxidation reaction”. Here, the synthesis of binary mixed oxide Ce-Hf (CH), ternary mixed oxide Ce-Hf-Ru (CHR), and Ce-Hf-Mg (CHM) has been attempted using the PVP-assisted sol-gel method and the possible soot oxidation mechanism has been proposed on the prepared catalysts.

The other paper is titled “Effect of Ag loading on praseodymium doped ceria catalyst for soot oxidation activity”. Silver-loaded praseodymium doped ceria (XAg/PDC) was synthesized by microwave-assisted coprecipitation and wetness impregnation. The soot oxidation T₅₀ temperature follows the trend: 5Ag/PDC~15Ag/PDC>10Ag/PDC>20Ag/PDC>0Ag/PDC. The Ag loading increased the surface reducibility of cerium ions and thus 5 wt% was optimized.

Click [here](#) to access her work.

Faculty achievements



Dr. P Vairavel, Assistant Professor - Selection Grade was conferred “The Most Admired Teacher Award” in the year 2021. He was also awarded a cash prize.

“The Most Admired Teacher Award” has been instituted by Sri Nandkishore S. Rathi, a distinguished alumnus of 1979 batch of Chemical Engineering, MIT in the form of a corpus fund, in memory of Late. Prof. Dr. Sampath Kumar, former HOD of Chemical Engineering. The winner among the nominations was chosen through voting by the final year students.

Student achievements



Koena Maji , B. Tech batch of 2023

Surabhi Aswath , B. Tech batch of 2022

Koena Maji and Surabhi Aswath along with and under the guidance of Dr. Anindita Laha, Assistant Professor, secured second place for their review paper presented at SCHEMCON, 2021, a national level conference in the field of chemical engineering. The topic of review was "Removal of contaminants from water using magnetic nanoparticles".



Mohammed Dilshaad Uzair, B. Tech batch of 2022

Secured best paper award at ScTACE - 2021 held by the department of civil engineering at Shri Vishnu Engineering College For Women (A), West Godavari, Andhra Pradesh. He was guided by Dr. C R Girish, Associate Professor for his work on "Removal of phenol from wastewater using locally available waste material".



Pratyusha Malrautu, B. Tech batch of 2022

Ashni Arun, B. Tech batch of 2022

Participated and presented a paper in the CRMSC -21 (International Conference on Cutting edge Research in Material Science and Chemistry) organised by Manipal University Jaipur.

Published a review paper titled 'Gelatin Nanofibers in Drug Delivery Systems and Tissue Engineering'. The paper can be found [here](#).

Published a review paper titled 'Collagen Nanoparticles in Drug Delivery Systems and Tissue Engineering'. The paper can be found [here](#).

Student achievements



Gaurav Agrawal, B. Tech batch of 2023

Participated in an oral presentation on paper titled 'Electrospun Nanofiber based Drug Carrier for Anti-Inflammatory Activity: A Review' at ICIRET-21 (International Conference on Innovative Research in Engineering and Technology) organised by Institute for Engineering Research and Publication (IFERP).



Harsh B Patil, B. Tech batch of 2024

Participated and secured Second Position in Quizzard 1.0 contest, conducted by the Student Entrepreneurship Cell, Manipal GOK-Bioincubator, MAHE, Manipal. It was a two phase virtual quiz which focussed on the theme of Industry (4.0 and 5.0) and Startup ecosystem.



Saksham Mamtani, B. Tech batch of 2024

Participated and secured the First Position in the Prof. P.K. Karanth Memorial Quiz Competition held during "Chemignite-2k21" organised by IChE Manipal.



Mohammad Zaeem, B. Tech batch of 2024

Participated and secured the Third Position in the Prof. P.K. Karanth Memorial Quiz Competition held during "Chemignite-2k21" organised by IChE Manipal.

Student achievements



Surabhi Aswath, B. Tech batch of 2022

Published a review paper titled 'A review on allopathic and herbal nanofibrous drug delivery vehicles for cancer treatments' published in Biotechnology Reports. It can be read [here](#).

Published a paper titled 'Atomistic Investigations of Polymer-Doxorubicin-CNT Compatibility for Targeted Cancer Treatment: A Molecular Dynamics Study' accepted and to be published by Journal of Molecular Liquids.

Published a review paper titled 'Recent advances in electrospun allopathic anti-cancerous drug delivery systems' published in Materials Today: Proceedings. This paper was also presented at CRMSC-21 (International Conference on Cutting Edge Research in Material Science and Chemistry) organised by Manipal University Jaipur.

Achieved 2nd Place in the Separation Process Category at National level conference, SCHEMCON-21 (Student's Chemical Engineering Congress organised by IISER Bhopal), oral presentation on 'Removal of Contaminants from Water using Magnetic Nanoparticles'.

Participated in a poster presentation on 'Recent studies on the efficiency of electrospun nanofibers for ocular drug delivery' at an international level Virtual Symposium organised by UKICRS (United Kingdom and Ireland Control Release Society).

Participated in an oral presentation on 'Electrospun Nanofiber based Drug Carrier for Anti-Inflammatory Activity: A Review' at ICIRET-21 (International Conference on Innovative Research in Engineering and Technology) organised by Institute for Engineering Research and Publication (IFERP).

Student achievements



Mrunmayee Bapat , M. Tech batch of 2021

Published a research paper titled “Kantorovich Distance Based Fault Detection Scheme for Non-Linear Processes” in IEEE Access, which can be read [here](#).



Sachin P Shet, M. Tech batch of 2021

Published a research paper titled “A review on current trends in potential use of metal-organic framework storage” in International Journal of Hydrogen Energy, found [here](#).



Akhil G Variar, M. Tech batch of 2021

Published a paper titled “Influence of various operational parameters in enhancing photocatalytic reduction efficiency of carbon dioxide in a photoreactor: A review” in the Journal of Industrial and Engineering Chemistry, found [here](#).



Agneya Kamath, M. Tech batch of 2021

Published a research paper titled “Atomistic investigations of polymer-doxorubicin-CNT compatibility for targeted cancer treatment: A molecular dynamics study: in the Journal of Molecular Liquids, found [here](#).

Published a review paper titled ‘A review on allopathic and herbal nanofibrous drug delivery vehicles for cancer treatments’ published in Biotechnology Reports, found [here](#).

Student achievements



Angel Francis , M. Tech batch of 2021

Published a paper titled “A review on recent developments in solar photoreactors for carbon dioxide conversion to fuels” in the Journal of CO2 utilization, found [here](#).



K Ramakrishna Kini, PhD Graduate 2021

K Ramakrishna Kini, Assistant Professor, Department of Instrumentation and Control Engineering, MIT, MAHE, defended his PhD Thesis on 12th October 2021 under the guidance of Dr. Muddu Madakyaru, Associate Professor (Senior Scale), Department of Chemical Engineering, MIT, MAHE.

His thesis titled “Multivariate Process Monitoring Using Multi-scale Version of Independent Component Analysis” emphasized on the development of a variety of data-driven fault detection strategies based on independent component analysis (ICA) for timely detection of sensor faults, which is an integral part of process health monitoring in chemical industries.

Student achievements

PROF. DR. P.G.K. MEMORIAL AWARD

Prof. Dr. P.G.K. Memorial awards have been instituted by MIT Alumni of 1984 batch of Chemical Engineering where a corpus fund was set in association with Manipal Foundation in memory of Late. Prof. Dr. P.G. Krishnamurthy.



Sachin Praveen Shet, M. Tech batch of 2021

Awarded the 'Prof. Dr. P.G.K. Memorial Award For Best Outgoing Student Of M.Tech Chemical Engineering' 2020-2021 with a cash prize of rupees ten thousand.



Shreyas A Shenoy, B. Tech batch of 2021

Awarded the 'Prof. Dr. P.G.K. Memorial Award For Best Outgoing Student Of B.Tech Chemical Engineering' 2020-2021 with a cash prize of rupees thirty thousand.



Avryl Anna Machado, B. Tech batch of 2022

The 'Prof. Dr. P.G.K. Memorial Award For Highest Marks Scored In The Subjects Mass Transfer I & II' 2020-2021 with a cash prize of rupees ten thousand.

Research story

MS. KOENA MAJI


B.Tech Batch of 2023, MIT Manipal



I believe research is a field that requires constant determination, relentless hard work and perseverance. One cannot expect an instant triumph on the very first attempt. My research journey too had various ups and downs. It is a common human psychology to get disheartened and lose one's engrossment as they move on. Your grit towards your subject and the domain will get tested here when you decide to deal with the stress and await till the end of the work you have taken up. Here, I present to you a glimpse my story.

It was beginning of my third semester when I realised that it is time to gear up my academics and take a chance to improve the content of my CV. The inspiration towards this novel thought is entirely credited to my seniors and the Research Society Manipal (RSM). Manipal Institute of Technology is a place which offers you an assortment of clubs and student projects. Here the students are able to discover diverse categories of choices. It is upon them to utilise it to the fullest.

The first hurdle I faced when I joined RSM, was to find my topic of interest and narrow it down to increase its specificity. This requires rigorous amount of research to draw light upon your curiosity. After successfully clearing all the rounds of the process to get an entry to the club, it was time to look for a professor and mail to request and show inquisitiveness to work under the respected teacher. Dr. Anindita Laha had a very similar research background to my arena. Our research area was Nanotechnology.



Nanotechnology is a very recent topic on which the scientists are developing a lot of interest mainly due to its very small size. It is being used in a range of industries like medical science and water treatment technology. One name that I have to mention here without which it would be an injustice is Ms. Surabhi Aswath a final year Chemical Engineering student. Her guidance from the very beginning till now is unputdownable.

After numerous meetings, alterations of decisions, Dr. Laha, Ms. Aswath and myself came upon the conclusion to write a review paper to give me an overview of this area. We targeted the SCHEMCON 2021 arranged by IISER, Bhopal and MANIT Bhopal to present our paper. It is a national conference where students from the entire country was allowed to present their papers on a range of topics. To begin with, I had to read atleast 20 research papers on my topic 'Removal of Contaminants from Water using Magnetic Nanoparticles'. The paper from it's starting till the end had to undergo alterations, inclusion of new topics, deletion of subjects.

Finally, the big day had arrived, 22nd October, 2021. Prior to the day of my presentation, I did not receive any formal practice session due to clash of schedule from both the professor's and my side. I precisely followed the template and guidelines of the Power Point Presentation given to me by my mentors. I composed a proper speech and practiced my entire presentation twice a day before the final event. On the day of the conference, I was assertive on the topic I was about to talk about. While delivering my speech, I made sure that I new my concepts well and also did background study to answer the questions asked by the judges after the delivery of my speech.

A week had passed, and I was doing my laboratory work at the Mass Transfer lab. While I was showing my records to Dr. Laha, Miss very surprisingly said, 'Koena, you have earned the second place.' Completely bewildered by such a sudden announcement, it took my few seconds for my brain to register the news. Thereafter, I was overwhelmed with the blessings, recognition and love my college and my professors have bestowed upon me. I will try with all my might to keep the flag of Manipal Institute of Technology flying high.

THE ALUMNI CORNER

Words of Wisdom from the past to the present

MR. BHARATRAM MURALIDHARAN

B.Tech Chemical Engineering, MIT, Manipal (2011)

MS Chemical & Biochemical Engineering - Rutgers University

Work: Deloitte Consulting - Austin, TX

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When I think of Manipal, I think of an emotion rather than an institution - an emotion I'd prefer to leave undescribed because I'd never do it justice. You simply experience it. My name is Bharat and I'm a proud Chemical Engineer from Manipal and an active alumnus always excited about giving back to the place I still call home.

I think the single most important factor in growth is the people we meet along our path, and Manipal was essentially the vessel that brought us together. I am thankful every day for the wonderful professors we have, the lab teams that helped us every day, xerox akka making sure we're all doing assignments, and even the teams at all the canteens making sure we only need to focus on learning about ourselves and of course, the amazing friends we make along the way. Manipal was a nurturing environment that allowed growth both inside and outside the classroom and made for the most memorable 4 years of my life. I still reminisce, I still dream.

The opportunity to write for this newsletter is a huge honour and made me reflect a lot. While I would love the chance to relive my DeeTee days, running in the rain to the chemical department, playing football at end-point, fighting for attendance or my constant complaints about sessionals & end-sems, what I really wanted to do was take you on a journey that goes beyond subjects and GPAs to talk about lessons learned about growth, adaptation, and confidence to hopefully give you some inspiration looking ahead in your careers.

I'm going to share some very candid recaps of my journey and hopefully give you the impetus to always fight for what you deserve.

When I sat for placements in Manipal, there were very few core, technical companies and even fewer that really sparked an interest in me. I remember not being eligible for a lot of opportunities and too scared to apply on my own. I advised myself that I had to work on what I had studied - because otherwise that's a waste of my education right?

Eventually, I decided to abandon placements and pursue my Masters at Rutgers University where I specialized in computational biochemistry for the Pharmaceutical industry. I enjoyed it but struggled to get opportunities when it came to placements. I wasn't decisive or proactive enough and if we're being very honest, I lacked confidence and interest. I told myself that others were smarter and more deserving of great opportunities. WORST thought-process ever.

Never tell yourself that you can't do something or don't deserve it.

I had to take a step back and took a bold decision to step away from the job hunt to understand myself and my skills. I started drawing parallels between things I had studied and jobs available and realized that I'm more than a one-trick pony. I started networking and instead of being afraid to show up, I started listening more and learning from others instead of trying to show I know something. The ability to learn is greater than the ability to know. Always.

I eventually moved to Texas and learned of Hydraulic Fracturing. I taught myself about the Oil & Gas industry and linked it back to courses I had done. During my time I was fortunate enough to work as an Engineer on oil rigs around the world, a Research Scientist doing R&D for Green Chemistry, a Product Analyst supporting the forecasting and release of new chemicals and even developed novel technologies for Exploration. I had achieved my Chemical Engineering dreams.

Or had I, did I truly enjoy it or was I simply good at what I did? Honestly, it was the latter. Disappointing realization, but now I was now in a position where for the first time I could chase a dream and find my passion. I needed to challenge myself. I eventually joined Deloitte Consulting and now I use my problem solving skills to help organizations solve their most complex problems focused on Sustainability, Energy and Technology. I feel much more at home and in my skin - the confidence shows.

The confidence to do or to change doesn't come overnight. I spent years building a profile. Identifying what I was passionate about and talking to people till I struck gold. The journey of self-assuredness is very difficult and something we're not taught. My mind directly took me back to Manipal and I knew I wanted to help shape the future of others. I reached out to Harish Kumar and we established a mentoring program with Chemical Engineers in Manipal. I've proudly been supporting the department and students since 2016 and to date have talked to and helped more than 40 students and even held 2 seminars.

The beauty of Manipal is that we all come from different worlds, we are intelligent beyond measure, we have empathy, we share strong ideas, and we foster great relationships. Our strength doesn't lie in how much we know, but how much we're willing to learn, and more importantly, teach - go explore and learn about yourself with a smile on your face.

NEW FACULTY ADDITIONS



Dr. Jitendra Carpenter

(Assistant Professor)

Education: Ph.D. in Chemical Engineering, Malaviya National Institute of Technology (MNIT), Jaipur, India

Previous Employment: SERB-National Post Doctoral Fellow at Institute of Chemical technology, Mumbai.

Research Interest: Emulsification, Encapsulation and release of bioactive molecules, Process Intensification, Cavitation, Sonochemistry, Wastewater treatment, Biofuels from wastes

Affiliations/Awards: He is the recipient of Young Scientist and International Travel Grant award by SERB, 2018 and CSIR-Senior Research Fellowship Award 2018

Native Place: Dewas, Madhya Pradesh, India



Dr Srikanth Divi

(Assistant Professor)

Education: Ph.D. in Chemical Engineering, IIT Bombay

Previous Employment: Research Associate in Chemical Engineering, University College London

Research Interest: Molecular dynamics, Monte Carlo and kinetic Monte Carlo simulations, Rare events, Catalysis, Segregation, Interfaces of Batteries and Photovoltaics, Surface studies of thin-film, Nanoparticles, Nanostructures, Nano-thermodynamics, Species Distribution in Nanoparticles.

Affiliations/Awards: He has been a scholarship student during his master's program, has won a travel grant for an AIChE 2016 meet at San Francisco, USA; has won awards in paper and poster presentations in conferences. He is the recipient of the RG Manudhane PhD Excellence Award, for the most outstanding Ph.D. thesis and also the Garuda Challenge Award at Parallel Computing Technologies (PARCOMPTECH-2013)

Native Place: Hyderabad, Telangana, India

Funzone

CHEMICAL WORDOKU

A wordoku is a sudoku on steroids. It is solved same as a sudoku except, letters are used instead of numbers. The puzzle is solved when you find the word formed by any one of the rows of columns.

Solve this chemical wordoku to test your skills.

A			S			U		
	I			L			T	E
			E		A	B	I	
				B			A	L
E			L	F				
L		T					B	U
	F	B		E	I			
					T	S		
	A	U				I		

The solution can be found [here](#)!

TEMPUS ARCHIVES

Take a deep-dive into our previous edition [here!](#)

THE ALUMNI CORNER

Words of Wisdom from the past to the present



MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VOLUME 1

JULY 2021

TEMPUS

CHEMICAL ENGINEERING DEPARTMENT
NEWSLETTER



INTERVIEW WITH
DR. GAURAV
BHATTACHARJEE
Forbes 30 Under 30

RECENT

DEPARTMENT EVENTS

UPCOMING EVENTS

Students' Chemical Engineering Congress (SCHEMCON)

Click on the link above to know more
An annual event organized by the Students' Chapter of Indian Institute of Chemical Engineers (IICHE) under one of its Regional Centers (IICHE Headquarter, Kolkata), is being organized jointly by MANIT Bhopal and IISER Bhopal. It provides a platform for MANIT Bhopal Engineers for interacting, learning and to gain exposure of research in the area of Chemical Engineering. The CHEMCON-2021 with a theme 'Globally Advancement Technology for Environment (GATE2021)' is expected to develop a formal platform for enriching scientifically through discussions and knowledge sharing in the field of chemical and process industries. The aim of the CHEMCON-2021 is to challenge and inspire the young chemical engineers, research scholars and faculty for exchanging knowledge, research, and experiences in a global scenario.



GOLDEN JUBILEE

Click above to access golden jubilee souvenir

Department completed fifty years and celebrated its Golden Jubilee on 21st December, 2019.

To mark this special event, alumni from different batches, the very first to the recently graduated, former heads of the department, retired staff, institute officials, faculty members, staff and students were present. This happy occasion also coincides with the Silver Reunion of the 1994 batch of alumni. Congratulations were extended to retired staff.

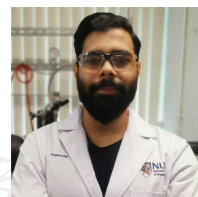


ILLUSTRIOUS ALUMNUS

AN INTERVIEW WITH DR. GAURAV BHATTACHARJEE

Outset, we would like to congratulate you on being listed in the top 30 under 30 Asia for your work on solidified

Outstanding and proud that being at MIT is a world and has in regard, we work and your



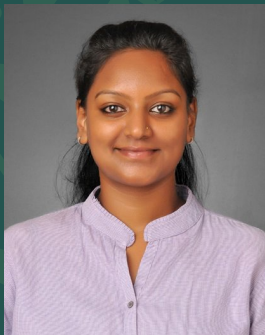
Pearl That Poisoned The

gshi Debraj, 2nd year
disasters abound and happy news seems few and far between, yet in a region when a fire ravaged the Singapore-flagged MV X-Press Pearl, set out on its ill-fated voyage on 15th May, 2020, following an explosion on board.
Navies worked in tandem to put out the fire. Their efforts, however, on winds, causing the blaze to last nearly two weeks. Salvage operations abandoned the operation when the vessel's aft portion sank.
red the Voyage Data Recorder or 'maritime black box' from the 'chemical leakage that caused the fire. It is to be handed over despite it being rejected by Qatar and India.
leaking chemicals, criticism has been levied against Indian and 'vented any loss of human life. However, this is cited as one of part from adversely affecting the local wildlife. It is a severe blow navy personnel have been deployed to clean up the beaches. s, there are long-term impacts that environmentalists and marine exposure to wind, waves, and UV radiation. They are bound to a threat to marine life.





Editorial Team



Ms. Suma
Shettigar



Dr. Muddu
Madakyaru



Dr. Anindita
Laha



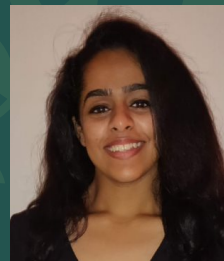
Aishwarya
Baliga



Anusha
YG



Avryl Anna
Machado



L Ananda
Shruthi



Amrita
Dam



Devangshi
Debraj



Koena
Maji



Nilay
Aundhe



Shourjya
Dutta



Vaishnavi
Karkare

Farewell Note



**Dr. Anindita
Laha**

We express our heartfelt gratitude for the contributions made by Dr. Anindita Laha (Assistant Professor) to the department newsletter, as we bid her farewell on her departure from the department.

Dr. Laha was an integral part of the Editorial Team. Her insights during the deliberations have immensely contributed to the widespread appreciation we received for our maiden issue.

We also thank her for the keen involvement in the current issue until her exit. Dr. Anindita Laha will surely be missed; we wish her all the best for her future endeavors.

Advisory Board



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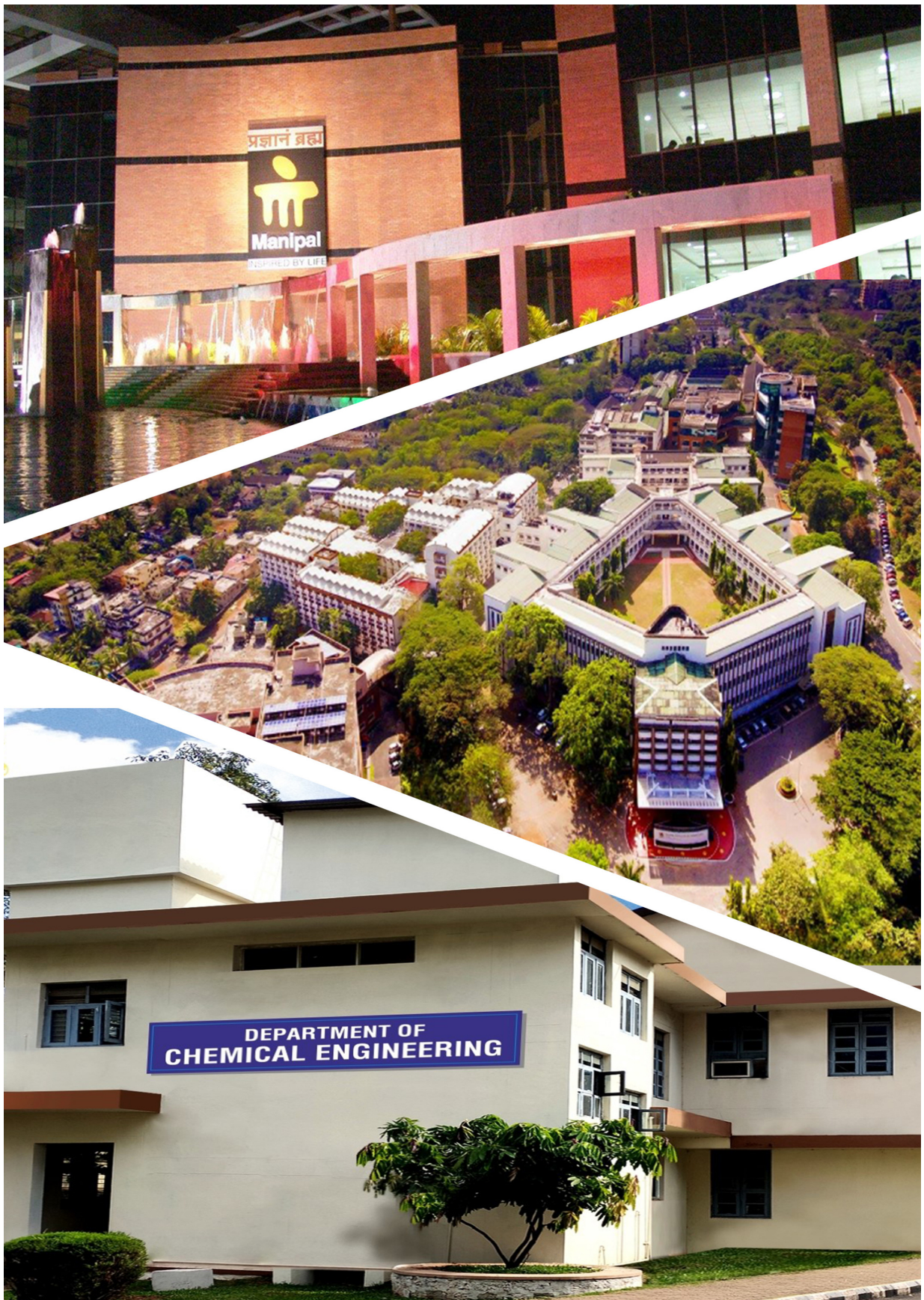
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