



**CHANDIGARH  
ENGINEERING COLLEGE  
CGC, LANDRAN, MOHALI**  
Building Careers. **Transforming Lives.**

# The Communiqué

News Magazine | Volume-30

ISSUE OCT 2023 - DEC 2023

*An Institution of Excellence*

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## ***Vision of the Chandigarh Engineering College- CGC, Landran, Mohali***

To become a leading institute of the country for providing quality technical education in a research based environment for developing competent professionals and successful entrepreneurs.

## ***Mission of the Chandigarh Engineering College- CGC, Landran, Mohali***

1. To provide state of the art infrastructure and engage proficient faculty for enhancing the teaching learning process to deliver quality education.
2. To give a conducive environment for utilizing the research abilities to attain new learning for solving industrial problems and societal issues.
3. To collaborate with prominent industries for establishing advanced labs and using their expertise to give contemporary industry exposure to the students and faculty.
4. To cater opportunities for global exposure through association with foreign universities.
5. To extend choice based career options for students in campus placements, entrepreneurship and higher studies through career development program.





**(Prof.) Dr. Rajdeep Singh**  
**Director Principal**  
**Chandigarh Engineering College-CGC, Landran, Mohali**

Dear Students, Faculty, and Staff

I'm brimming with great pride and excitement as I compose this message for the college magazine. The past year has been truly remarkable, filled with remarkable accomplishments that have solidified our institution's standing for excellence and innovation. However, our success is not only determined by the accolades we receive. It's all about the thriving community we've built, where students constantly push themselves academically, explore new creative frontiers, and form lasting bonds. Our faculty members are truly dedicated to their students, going the extra mile to provide mentorship and inspiration. They create an environment that nurtures a passion for learning, which goes beyond the confines of the classroom.

Apart from academic prowess, our students have consistently shone in national and international competitions, bagging top honours in numerous competitions. Their dedication is truly inspiring, and their success is a testament to the quality of education and exposure we provide at CEC-CGC. Our faculty members are also at the forefront of groundbreaking research, contributing to valuable advancements. Their commitment to pushing the boundaries of knowledge is not only enriching the academic landscape but also making a real difference in the world.

Lastly, to my students, I would like to convey that embrace the opportunities that come your way, challenge yourselves, and never stop learning. The world needs your bright minds and innovative ideas.

May you all soar to new heights and accomplish everything that you set out to do!



**Dr. Ruchi Singla**  
**Director Research & Innovation**  
**Department of RISE**  
**Chandigarh Group of Colleges**

My dear fellow explorers and relentless seekers of knowledge,

Welcome to this vibrant issue of our college magazine, a testament to the insatiable curiosity that drives us on the wondrous journey of discovery. As a Director-Research & Innovation, I bear witness to the daily firestorm of inquiry that crackles within CGC's walls, and it fills me with an immense sense of pride and excitement.

This edition also pulsates with the rhythm of innovation. It showcases the bold ventures of students and faculty delving into the unknown, venturing beyond the familiar, and challenging the very boundaries of knowledge. This magazine is a snapshot of the dynamic research landscape and various other opportunities that we cultivate here. *Communicate* is a platform for everyone to share their research endeavors, their challenges, and their triumphs. It's a bridge connecting diverse disciplines, igniting cross-pollination of ideas, and fostering a collaborative environment where innovation thrives.

Through *Communicate*, I encourage everyone to actively engage in research and make the most of the resources offered by CGC. Always keep in mind that each and every one of you has the ability to become a visionary, a trendsetter, a catalyst for transformation. So, dear students and faculty let this magazine be your beacon of inspiration. Let it ignite the embers of curiosity within you, and let it propel you on your own unique path of discovery. Remember, research isn't just a pursuit of knowledge; it's a journey of self-discovery, a chance to push the boundaries of your own understanding and make a meaningful contribution to the world around you.

With unwavering support for your intellectual adventures, wishing you all the very best for future!



### ***From the Editor's Desk....***

Dear Readers,

Welcome to the 30th edition of our college magazine. As we turn the page on another quarter, I find myself brimming with excitement for the vibrant tapestry of activities woven into the life of our college. From bustling classrooms to hushed libraries, from sun-drenched fields to echoing corridors, every corner seems to buzz with energy and purpose.

Our recent months have been filled with a diverse range of activities that have enriched our collective journey. *Communique* captures the essence of this journey we have embraced. These moments are the heart and soul of our college community, where diverse voices, enthusiastic performances, and a spirit of teamwork converge. So, let us continue to learn, to challenge, to create, and to celebrate the remarkable journey that is life at CEC-CGC.

Lastly, I would like to extend my heartfelt gratitude to every single contributor for their steadfast dedication. Their fervour has revitalized these pages, culminating in a magazine that genuinely exemplifies the spirit of our institution. I am extremely grateful for the assistance of everyone involved in bringing this publication to fruition.

Wishing you all a Happy Reading!

**Dr. Inderjot Kaur**  
**Chief Editor**

## **RANKING & AWARDS 2023**

### **1 NIRF Ranking 2023**

- CEC-CGC Landran has been ranked in 100-150 Band in Engineering Category

### **2 NIRF Innovation 2023**

- CEC Positioned in the band of 51-100 in the Innovation Category

### **3 Patent Filing Rank**

- CGC Landran bestowed with 4<sup>th</sup> position Pan India among the Top 10 Patent filing Institutes and 3<sup>rd</sup> among the Top 5 in the field of Information Technology along with the IITs, other premium Institutions and IT Corporates in the country.

### **4 MoE-AICTE**

- CEC-CGC, Landran, Mohali has received the highest 3.5-star rating by Institution Innovation Council of the Ministry of Education (MoE) and All India Council of Technical Education (AICTE) for demonstrating excellence in activities related to Innovations, Entrepreneurship, Startups, and Research & Development.

### **5 Dataquest CMR Employability Index Survey 2023**

- 10<sup>th</sup> Rank Overall among top 100 T Schools (Government and Private)
- 6<sup>th</sup> Rank Overall among top T Schools (Private)
- 5<sup>th</sup> Rank in North India in Top 10 Zone Wise Institutes (Government and Private)

### **6 Dataquest Tech School survey, 2023**

- 1<sup>st</sup> in Punjab in Top 100 T-Schools (Overall) – Government and Private
- 1<sup>st</sup> in Punjab in Top T-Schools (Private)
- 15<sup>th</sup> rank in Top T-Schools (Private)
- 5<sup>th</sup> rank in North India (Zone Wise)
- 22<sup>nd</sup> rank in Top 100 T-Schools (Overall) – Government and Private

### **7 India Today Ranking 2023**

- 2<sup>nd</sup> Rank in Private Colleges in Punjab
- 4<sup>th</sup> Rank in Private Colleges and Universities in Punjab
- 61<sup>th</sup> Rank across country among Private Colleges
- 1<sup>st</sup> in Top Five Gainers among First 100 (Govt+Private)

## **8 Outlook I-Care Rankings 2023-India's Best Colleges**

- 59<sup>th</sup> among top 100 private institutes in India
- 4<sup>th</sup> private institute among Punjab including (University's Institutes)
- 1<sup>st</sup> private college in Punjab (excluding university's Institutes)

## **9 THE WEEK-Hansa Research Survey 2023**

- 8<sup>th</sup> in private colleges North Zone
- 39<sup>th</sup> Rank in private Engineering colleges across the country
- 65<sup>th</sup> Rank in Engineering Colleges all over India

## **10 Times of India Engineering Survey 2023**

- 3<sup>rd</sup> in Research Capabilities
- 91<sup>th</sup> in Top 170 Private Institutes
- 88<sup>th</sup> in Top 125 private Engineering Institutes

## **11 CSR-CHRDC Ranking 2023**

- 12<sup>th</sup> Position in Top Emerging Colleges of Super Excellence
- 4<sup>th</sup> Position in Top Engineering Colleges in State of Punjab

## **Engineering Graduates Conferred with Degrees during 17<sup>th</sup> Annual Convocation**

An air of electricity buzzed through the auditorium as the Graduating Engineering classes of B.Tech marched in, their robes billowing like sails in the wind of expectation. 23<sup>rd</sup> December, 2023 marked the culmination of years of sleepless nights, tireless experiments, and relentless ambition at Chandigarh Engineering College-CGC, as the young engineers proudly received their hard-earned degrees.

The ceremony, a tapestry woven with pride, nostalgia, and hope, unfolded under the watchful gaze of dignitaries, professors, and parents who beamed with unbridled joy. Honourable President CGC, S. Rashpal Singh Dhaliwal, in his opening address, likened the journey of these engineering pioneers to building a bridge – fraught with challenges, demanding meticulous planning, and ultimately culminating in a masterpiece that connects aspirations to reality.

The Chief Guest, Mr. Sumed Marwaha, Managing Director, Unisys India Pvt. Ltd. connected with the graduating class, highlighting the similarities between engineering marvels and the resilience needed to navigate life's complexities. His anecdotes, filled with humour and wisdom, were a powerful reminder that although plans can provide guidance, it is the engineer's determination and flexibility that ultimately shape the end result. Campus Director Dr P.N. Hrishikeesha expressed his congratulations to the graduates and offered his blessings for their future endeavours. The Annual Report of the College for the academic year 2022-23 was presented by Dr. Rajdeep Singh, the Director-Principal.

As the degrees were awarded, a tangible feeling of achievement permeated the atmosphere. The applause resounded not only for the graduates, but also for the parents, mentors, and teachers who had supported their journey. At that moment, it became evident that this wasn't merely the conclusion of a chapter, but rather the thrilling start of an engineering adventure that will influence the future of our world.

The ceremony concluded with a powerful rendition of the alma mater, voices weaving a poignant melody of shared memories and boundless potential. As the graduates stepped out into the sunshine, their degrees held high, it was impossible not to feel a surge of optimism. These young engineers, armed with their knowledge, grit, and unwavering spirit, were ready to write the next chapter in the ever-evolving story of human ingenuity.

This convocation was more than just a celebration of past accomplishments; it served as a powerful reminder of the boundless potential that lies ahead. It was a remarkable display of the lasting impact of education, a vivid representation of the hopes and ambitions of a generation determined to shape a brighter future.



## **CEC- CGC hosted the Grand Finale of Smart India Hackathon- 2023**

33 teams consisting of more than 200+ students including their mentors from across India, hailing from Chhattisgarh, Tamil Nadu, Odisha, West Bengal, Maharashtra, Rajasthan, Madhya Pradesh, Uttar Pradesh, Uttarakhand, New Delhi, Telangana and Karnataka converged at Nodal Center, Chandigarh Engineering College-CGC, Landran, Mohali to compete in the grand finale of Smart India Hackathon 2023 (SIH 2023) - software edition, on 19<sup>th</sup> & 20<sup>th</sup> December, 2023. SIH 2023 offered 231 problem statements received from 51 departments of 25 Ministries. 12,000+ participants participated in this year's national level, SIH 2023 grand finale. A total of 1,282 teams were shortlisted this year for the grand finale to provide solutions on various themes including Space Technology, Smart Education, Disaster Management, Robotics and Drones, Heritage and Culture etc. Prime Minister Shri Narendra Modi addressed and interacted with the participants during the finale via video conferencing.

The Chief Guest Mr Sachin Khosla, CEO & Founder, DigiMantra Labs, inaugurated day one of SIH 2023 at CEC-CGC Landran. He was accompanied by the Guest of Honour, Ms Ritika Singh, CEO & Founder, Kontent Factory, Dr. P.N. Hrisheeksha, Campus Director, CEC-CGC Landran, the Deans and Directors of the institution. The central inauguration was virtually done across all 47 nodal centers, by dignitaries including Prof. (Dr.) T.G. Sitharam, Chairman, AICTE and Dr. Abhay Jere, Vice Chairman, AICTE.

The 33 teams competing at CEC- CGC Landran were assigned six Problem Statements (PS) by two ministries namely, the Ministry of Commerce and Industry (MoC&I) and Ministry of Defence (MoD). The problem statements by the MoD required these young innovators to ideate effective, technological solutions to facilitate early detection and mitigation of snow avalanches in mountainous terrains; Devising novel AI or ML technology other than the already existing radar based ground-penetrating methods, to detect victims buried under snow avalanches expediting their rescue and chances of survival. Another saw these student innovators attempting to develop lean module for reasoning about complexity in GPTs. The problem statements given by the MoC&I required the participants to develop a software for dubbing of videos from English to other Indian regional languages, and also a software that can translate resource material and other texts from English to other Indian regional languages. Another PS aimed solutions to developing interactive gaming software/mobile application on Intellectual Property Awareness for school students.

In line with the Prime Minister's vision of youth-led development, SIH 2023 is a nationwide initiative, jointly organized by Ministry of Education's Innovation Cell, All India Council for Technical Education (AICTE), and i4c. Doordarshan and Akashwani were the media partners of the Smart India Hackathon 2023. AWS and Hero were the official partners and Hack2Skill was the knowledge partner of the event.

The competition aimed to provide students a platform to solve the pressing problems of the government, ministries, departments, industries and other organizations. At each nodal center, an officer was designated by the Ministry of Education's Innovation Cell to monitor and preside over the proceeding during the entire duration of SIH grand finale. Mr. Deepak Kumar, Assistant Director DPIIT, Ministry of Commerce and Industry, presided over in this capacity for nodal center CEC-CGC Landran.

On day 2, seven teams were declared winners of SIH-2023 grand finale (software edition) that successfully concluded at nodal center CEC-CGC Landran. While five teams won cash prize of Rs. One lakh each, two teams which were declared joint winners were awarded cash prize of Rs. 50,000/-, each. CEC-CGC Landran hosted SIH finale for the sixth consecutive year. All the winning teams were felicitated with cash cheques, certificates and trophies by the Chief Guest - Dr. Jatinder Kaur Arora, Executive Director, Punjab State Council for Science & Technology. Dr. Arora congratulated the winners while expressing her admiration for all the participants who worked tirelessly on the problem statements. Hailing their unique solutions to solve real time challenges, she encouraged them to keep innovating and using their brilliance in furthering the aim of making India self-reliant or *Atamnirbhar*.

**Team 'Byte Busters'** from Karnataka **won Rs One Lakh**, for developing a software that can translate resource material and other texts from English to other regional languages. **Team 'Tech\_Titans'** from Andhra Pradesh bagged **Rs. One lakh** as prize money for developing a software that would enable the dubbing of videos from English to other Indian regional languages. **Team 'The Atoms'** from Tamil Nadu **won Rs One Lakh** for providing an innovative solution of developing a lean module for reasoning about computational complexity in GPTs. **Team Ava Guardians** from Rajasthan **won Rs. One lakh** for developing a novel technology for early detection and mitigation of avalanches. **Team Hexa Tech** from Tamil Nadu **won Rs. One lakh** for devising a method for identification of victims buried under avalanches. **Team 'Virtual Voyagers'** from Tamil Nadu, and **team 'Crimson'** from Telangana that were **declared joint winners**, were awarded cash **prize of Rs 50,000/- each**, for developing an interactive gaming software/mobile application on intellectual property awareness, for school students.



## **Expert Lecture on “Innovation in Various Spectroscopic Techniques”**

Dr. Amit L. Sharma Sr. Principal Scientist CSIR-CSIO, Chandigarh specializing in handling various Analytical Instruments like FT-IR and UV-visible-NIR spectrophotometer, addressed the Faculty and students of Department of Applied Sciences, Chandigarh Engineering College-CGC Landran, Mohali on 17<sup>th</sup> November, 2023. The learned speaker dwelled on a UV-Visible, IR and Photoluminescence Spectroscopy and its instrumentation. His lecture was heard with great interest and attention by the students as it included pictorial and graphical illustrations as well. The session was attended by more than 180 students from Informational Technology, Electronics and Communication, AI-ML, CSE DS & AI-DS Engineering domains. Dr. Amit L. Sharma is well known for excellence in imparting education in the field of Analytical Instrumentation. He has won awards like CSIR Technology Award: for the Year 2020 and published numerous scholarly papers in national and international journals.



## **ECE Department organized Faculty Development Program on “IoT and its Applications”**

5-days Faculty Development Program on “IoT and its Applications” was organized by Electronics and Communication Engineering Department in association with NITTTR Chandigarh from 6th November to 10th November 2023. This programme was intended to provide the participants a common platform to share the knowledge, experience and innovation in the areas related to basics and advances in Internet of Things in Engineering and Technology and also provided an opportunity to interact with eminent personalities working in these areas. Experts from renowned institutes like NITTTR Chandigarh, CSIO-CSIR Chandigarh imparted knowledge on topics IoT systems, Architectures, Challenges, Communication protocols and industrial requirement, Real time applications with problem solving approach. At the end of the program, the participants from different engineering domains enhanced their knowledge on the basics and advances in the field of Internet of Things and also found new directions for further research.



## **ECE department organized FDP on “Advancements in Wireless Communication: Understanding and Implementing 5G Technology”**

5-days Faculty Development Program on “Advancements in Wireless Communication: Understanding and Implementing 5G Technology” was organized by Electronics and Communication Engineering Department from 11<sup>th</sup> December 2023 to 15<sup>th</sup> December 2023. This programme was intended to provide the participants a common platform to share the knowledge, experience and innovation in the areas related to basics and advances in Wireless Communication and 5G technology. It also provided an opportunity to interact with eminent personalities working in these areas. Experts from renowned institutes like NITTTR Chandigarh, CCET-Chandigarh, PEC-Chandigarh, UIET, Kurukshetra University imparted knowledge on topics like emergence of 5G technology, architecture and challenges, Industrial IOT, Massive IOT, Natural Language Processing, Federated learning, hybrid soft computing algorithms, Artificial Neural Network (ANN), BSS (Blind Source Separation) techniques. At the end of the program, the participants from different engineering domains enhanced their knowledge on the basics and advances in the field of Wireless Communication and 5G technology.



## Staff Development Programme on Effective Workplace Communication

Five days Staff Development Program on Effective Workplace Communication was organized by Applied Sciences Department from 11<sup>th</sup> to 15<sup>th</sup> December, 2023. Dr. Harpal Singh (HOD) and Assistant Professor (English) Ms. Inderjot Kaur spearheaded the planning of this SDP. The first day of the SDP began with a comprehensive introduction to communication skills by Ms. Kavita Dhillon, an Assistant Professor of English. Ms. Dhillon also gave a presentation on the topic, “Mechanics of effective writing including email & letter writing”. On the second day Mr. Krishan Kant, A.P. (English) delivered a lecture on the topic, “Work ethics & importance of effective communication”. The third day session was conducted by Ms. Gurpreet Kaur A.P. (English) on “Importance of effective body language”. The fourth day session was conducted by Ms. Mansimran Kaur, A.P. (English) on the topic “How to give self- introduction, importance of intonation & voice modulation. The fifth and final day session was led by Ms. Inderjot Kaur, A.P. (English). The session focused on improving vocabulary, pronunciation, and speaking skills. The participants were extremely satisfied after attending all the sessions. After the session concluded, Dr. Harpal Singh engaged with the participants and expressed gratitude for their exceptional cooperation.



## ACS Club organized Technical Treasure Hunt

The ACS club of Applied Sciences Department organized Technical Treasure Hunt on 31<sup>st</sup> October 2023 as a part of Parivartan 2K23- A Techno Cultural Fest of CGC. The event was organized by ACS Faculty Coordinator Dr. Meena Devi under the guidance of Dr. Harpal Singh, Head of Applied Sciences Department. The event was judged by Ms. Inderjot Kaur, Faculty CEC-CGC. The event was designed to captivate participants in an exciting and stimulating competition, putting their problem-solving abilities, technical expertise, teamwork, and aptitude for unraveling clues to the test. A large number of students from different colleges participated in this event. The competition comprised of three rounds consisting of 50 clue stations strategically placed across the venue. Every clue station posed a distinct technical challenge, demanding participants to tackle coding problems, puzzles, riddles, and various other challenges. The clues were carefully crafted to guide teams step by step towards the ultimate destination of the treasure.

A team of GNA University, Phagwara headed by Ekamjit Singh secured 1<sup>st</sup> position. A team of CEC-CGC Landran Mohali headed by Aarushi secured 2<sup>nd</sup> position and a team of CEC-CGC Landran Mohali headed by Rohit Pal secured 3<sup>rd</sup> position. The winning teams were conferred with cash prizes of Rs 6000, 4000 and 2000 respectively. The winners were also conferred with trophies, medals and certificates.



## CEC-CGCians participated in SIH Grand Finale (Hardware Edition)

The students of Department of Mechanical Engineering, CEC-CGC, Landran, Mohali, showcased remarkable innovation at the Smart India Hackathon, Hardware edition, held in Coimbatore from December 19 to 23, 2023. The participating students successfully addressed the Ministry of Home Affairs, GOI's problem statement: "Robotics Device for Borewell Rescue Operation." Their dedicated efforts resulted in the development of an effective robotic device tailored to this critical task. This participation not only demonstrated the students' commitment to solving real-world challenges but also highlighted the department's prowess in fostering creative solutions to address societal needs.



## Two Days Hands On Workshop on IOT using Arduino

The Department of Information Technology, CEC-CGC and Institutions Innovation Council (IIC) held a two-day IoT workshop with Arduino on October 16-17, 2023. The workshop aimed to equip students with practical IoT and Arduino skills. The speakers for the workshop were Mr. Ishant Raju and Mr. Nishant Raju, founders of Raju Bros Softech Private Limited, who shared their IoT expertise with the attendees. They introduced IoT's importance and various sensors, followed by an Arduino overview, focusing on Arduino Uno's role in IoT. The speakers discussed real-world IoT applications and also toured the IoT lab. The workshop was a success, empowering students with IoT and Arduino knowledge and practical skills, while fostering industry connections.



## Expert Talk on “Unlock the power of Python in Machine Learning”

The Department of Information Technology, CEC-CGC and Institution’s Innovation Council (IIC) organized an expert talk on Python in Machine Learning on October 26th, 2023. Led by industry experts from Novem Controls Pvt Ltd., the talk aimed to teach students the basics of Python and its applications in machine learning. The speakers discussed Python's importance, its use in real-world problem-solving, and popular machine learning libraries. The talk concluded with examples of real-world machine learning projects, encouraging students to develop their own ideas. Overall, it provided valuable insights and skills for students to pursue machine learning projects.



## **Workshop on "The Future of Education: Harnessing Generative AI for Effective Teaching"**

The Department of IT and Chandigarh Engineering College-CGC, through the Institution's Innovation Council (IIC), organized a workshop on "The Future of Education: Harnessing Generative AI for Effective Teaching" on December 1st, 2023. The speaker, Mr. Roshan Kumar, Founder and CEO, Scrollwell, focused on the future of education and the capabilities of generative AI, emphasizing its use in research and creating a dynamic learning environment. Participants received hands-on training on various AI resources, including Freepik, SlidesGo, ChatGPT, Canva, MS PPT Online, AI PPT Maker, and Wondershare - Smart Presentations. These tools were highlighted for their potential to enhance teaching effectiveness by creating visually engaging presentations. The workshop aimed to develop the teaching skills of faculty members through practical training on diverse AI tools, contributing to an improved teaching-learning process.



## **FDP on "Cyber Security and Threat Intelligence "**

The Department of IT along with the Institution's Innovation Council (IIC), conducted a Faculty Development Program on "Recent Trends in Cyber Security and Threat Intelligence" from December 4th to 8th, 2023. The program aimed to enhance participants' practical insights and skills in cyber security. Experts, Mr. L J Singh and Mr. Dhananjay from CDI, provided training on defending against various cyber threats, including phishing attacks, XSS attacks, DOS/DDOS attacks, SQL injection attacks, and more. Hands-on sessions covered tools such as Hidden eye, Meta sploit, and WAF/TI dashboard. The FDP included detailed discussions on trending cyber security topics like the Dark Web, VPN Proxy, Backdoor, and Threat Intelligence. Emphasizing hands-on learning, the program successfully enhanced participants' knowledge, enabling them to integrate relevant content into their teaching curricula.



## CSE Department organized Expert Talk on “Cyber Security and Ethical Hacking”

The CSE Department of CEC-CGC organized an expert talk on 'Cyber Security and Ethical Hacking' for third-year students on 26th October, 2023. It was a two-hour interactive session led by Ms. Karanpreet Kaur, a Senior Information Security Analyst at CDAC, Mohali. The session was extremely engaging. Students actively participated in the talk and they learned various technical terms related to ethical hacking activities. The primary objective of this talk was to raise students awareness regarding career opportunities in cybersecurity and guide them about entering the field of ethical hacking.



## CSE Department of CEC-CGC Organized Expert Talk on “ReactJS”

The CSE Department of CEC-CGC organized an expert talk on "React JS" for 2nd-year students on 27th October, 2023. The two-hour interactive session was taken by Mr. Nikhil Sagar and Mr. Rohit Chugh, both of them working as React JS Developers at Zestgeek Solutions Pvt. Ltd., Mohali. The talk provided valuable insights into the core concepts and props, covering advanced topics such as React Hooks and state management best practices. The talk aimed to deepen participants' understanding of ReactJS, encompassing both fundamental and advanced concepts. Through interactive discussions and Q&A, attendees gained practical insights and solutions, with the objective of fostering ongoing community engagement and knowledge-sharing within the ReactJS development community.



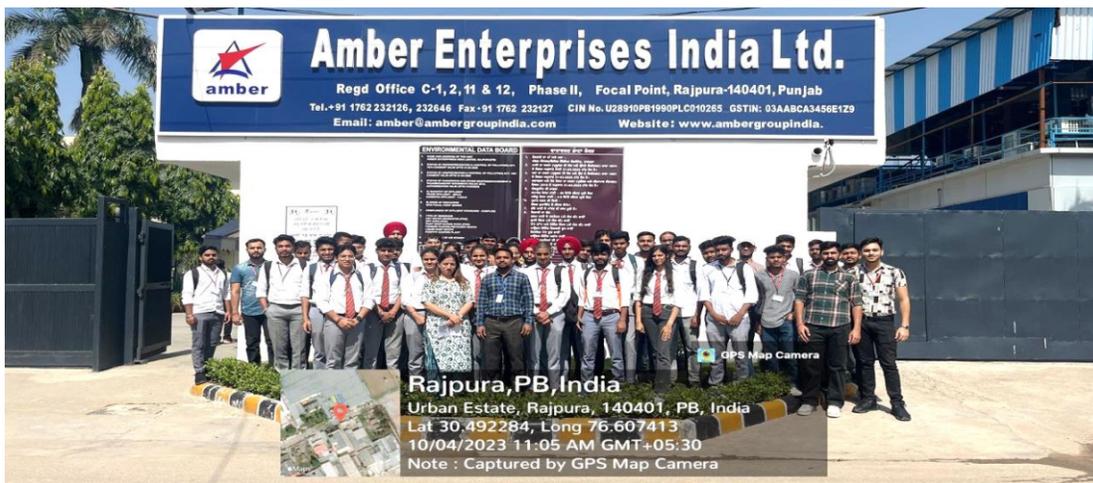
## Industrial Visit to “Amber Enterprises India Limited”

On 04<sup>th</sup> October 2023, the Department of Mechanical Engineering organized an industrial visit to Amber Enterprises India Limited Boilers Limited. The Industrial Visit, aimed to educate students on HVAC R&D unit operations. The visit provided insights into the HVAC industry processes, emphasizing various testing procedures for air conditioners. Students gained practical knowledge, witnessing first-hand technical aspects involved in the testing of air conditioning units. The visit successfully met its objective of enhancing students' understanding of HVAC operations, contributing to their academic and practical development.



## ECE department organized an Industrial visit to Amber Group, Rajpura

ECE Department in collaboration with IIC Cell organized industrial visit to Amber Group, Rajpura for the students of B.Tech ECE 3<sup>rd</sup> semester on 04<sup>th</sup> October 2023. The visit aimed at sensitizing the students for better technical knowledge enhancement. Students got the knowledge about latest design and manufacturing of air-conditioning and Heat exchanger.



## **Digital Transformation through Digital Twin**

**By: Ms. Vanmala (Assistant Professor)**



A digital twin serves as a virtual representation of a physical entity, be it an object, person, or process, within a digital environment. This innovative concept allows organizations to simulate real-world scenarios and their potential outcomes, providing a valuable foundation for informed decision-making.

Imagine having a digital replica of yourself, indistinguishable in every detail, set within a precise digital rendering of your surroundings. This digital counterpart, or digital twin, is immune to injury, pain, or embarrassment, presenting intriguing possibilities for enhanced decision-making certainty.

In the business realm, digital twins act as virtual replicas linked to real-time data sources, offering insights into the behaviour of the corresponding physical entities. When integrated into a cohesive system, these digital twins create an enterprise metaverse—a digital environment replicating and interconnecting various aspects of an organization for optimized simulations, scenario planning, and decision-making processes.

There are distinct types of digital twins, such as product twins representing the entire life cycle of a product, production plant twins simulating manufacturing facilities, procurement and supply chain twins, and infrastructure twins representing physical structures like highways or buildings.

The value digital twins bring to organizations is significant, particularly in reducing time-to-market and improving product quality through rapid iterations and early flaw identification in the design phase. Additionally, digital twins contribute to environmental sustainability efforts by enhancing product design efficiency, reducing material usage, and improving traceability to minimize waste.

Implementing digital twins requires digital maturity—a robust data infrastructure providing reliable data from testing and live environments. The process involves creating a blueprint, building the base digital twin, and enhancing capabilities over time. Organizations can start their journey with a single digital twin based on a high-quality data product, evolving it based on insights from behavioural data for predictive capabilities.

Several companies are already leveraging digital twins for diverse applications. Emirates Team New Zealand, for instance, uses a digital twin to test sailing environments and boat designs, allowing for the evaluation of thousands of hydrofoil designs. The Space Force of the US Armed Forces is creating a digital twin of space, incorporating replicas of celestial bodies and satellites for advanced simulations. The growing interest in digital twins is expected to lead to significant investments, with estimates surpassing \$48 billion by 2026.

## **Finding Peace in the Present: The Power of Mindfulness**

In our fast-paced world filled with constant distractions, finding inner peace can sometimes feel like a distant dream. However, there is a simple practice that can help us reconnect with the present moment and cultivate a sense of calm and clarity. It's called mindfulness, and its benefits extend far beyond the meditation cushion.

### **What is mindfulness?**

Mindfulness is the practice of intentionally paying attention to the present moment without judgment. It involves bringing awareness to our thoughts, feelings, bodily sensations, and the world around us. By focusing on the here and now, we can break free from the grip of worries about the past or future.

### **Reducing stress and anxiety:**

One of the most significant benefits of mindfulness is its ability to reduce stress and anxiety. When we practice mindfulness, we become aware of our thoughts and emotions without getting caught up in them. This helps us develop a more compassionate and non-reactive relationship with our inner experiences, leading to a greater sense of calm and resilience.

### **Enhancing mental well-being:**

Mindfulness has been shown to improve overall mental well-being. Regular practice can increase self-awareness, boost self-compassion, and promote a positive outlook on life. It can also help us manage difficult emotions, such as sadness or anger, by allowing us to observe them without being overwhelmed.

### **Improving focus and concentration:**

In a world filled with distractions, cultivating focus and concentration is a valuable skill. Mindfulness practice trains our attention and helps us become more present and engaged in whatever we are doing. By sharpening our focus, we can enhance productivity, creativity, and overall performance.

### **Conclusion:**

Incorporating mindfulness into our daily lives can have profound effects on our well-being. By taking a few moments each day to pause, breathe, and tune in to the present moment, we can find a sense of peace amidst the chaos. So, why not give mindfulness a try and unlock the transformative power it holds.

**Mehak Sachdeva**  
**BTech ECE**  
**Roll No. 2237225**

## **CYBER SECURITY**

Cyber Security means protecting data, networks, programs and other information from unauthorized or unattended access, destruction or change. In today's world, cyber security is very important because of some security threats and cyber-attacks. For data protection, many companies develop software. This software protects the data. Cyber security is important because not only it helps to secure information but also our system from virus attack. After U.S.A. and China, India has the highest number of internet users.

**Cyber Threats:** It can be further classified into 2 types. Cybercrime—against individuals, corporates, etc. and Cyber warfare – against a state.

**Cyber Crime:** Use of cyberspace, i.e. computer, internet, cellphone, other technical devices, etc., to commit a crime by an individual or organized group is called cyber-crime. Cyber attackers use numerous software and codes in cyberspace to commit cybercrime. They exploit the weaknesses in the software and hardware design through the use of malware. Hacking is a common way of piercing the defenses of protected computer systems and interfering with their functioning. Identity theft is also common.

**Cyber Warfare:** Snowden revelations have shown that Cyberspace could become the theatre of warfare in the 21st century. Future wars will not be like traditional wars which are fought on land, water or air. When any state initiates the use of internet-based invisible force as an instrument of state policy to fight against another nation, it is called Cyber war.

### **Inexpensive Cyber Security Measures**

- The simplest thing you can do to up your security and rest easy at night knowing your data is safe is to change your passwords.
- You should use a password manager tool like LastPass, Dashlane, or Sticky Password to keep track of everything for you.
- Keep your Softwares up to date.

### **Conclusion**

Today due to high internet penetration, cyber security is one of the biggest needs of the World as cyber security threats are very dangerous to the country's security. Not only the government but also the citizens should spread awareness among the people to always update your system and network security settings and to the use proper anti-virus so that your system and network security settings stay virus and malware-free.

**Mehak Sachdeva**  
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## **Blockchain-The Unbreakable Backbone of Decentralized Possibilities**



Have you ever marvelled at the trust and confidence that people place in crypto currencies? What drives them to invest their hard-earned money in digital assets that are intangible and volatile? How did online voting overcome the challenges of security and reliability to become a viable alternative to traditional ballots? And how is it possible that your money is safer in cyberspace than in your wallet? That is the power of blockchain, a revolutionary technology that is transforming the way we store, transfer and verify data.

Imagine a world where your data is stored in a single place, accessible by anyone who has the right credentials or the wrong intentions. This is the problem with the traditional system of data storage, where a central authority control everything. What if there was a better way to store, share and secure your data, without relying on a third party? This is where block chain comes in, a revolutionary technology that changes the rules of the game.

Obviously, the data will be stored in some database, but this time, instead of a single centralized database, there will be a network of databases, where each one holds a piece of the puzzle and works together to create a complete picture. Data is shared and synchronized in among different nodes (blocks) in a decentralized network. Each node is linked to another (what we call chaining) and take some kind of reference from its previous node.

Now let us know something called cryptographic hash functioning. Each new block added to the existing chain is assigned some hash depending on the block's properties. The hash is unique, like a fingerprint, and it also links the block to the previous one, by including its hash as well. This creates a chain of trust and verification, where each block depends on the one before it. This is how cryptographic hash functions work, a technology that secures and connects data in blockchain.

The network is made up of many nodes, or computers, that each has a copy of the data. They all use a consensus mechanism, a method of reaching agreement, to decide which blocks of data are valid and which are not. If someone tries to cheat and change a block, they will face a tough challenge. They will have to persuade the majority of the nodes to accept their fake block, which is unlikely unless they have more power than the rest of the network. And they will have to do this for every block that comes after the one they changed, because each block is linked to the previous one by a code. This makes it very hard for hackers to mess with the data in blockchain, because they have to fight against the whole network.

Once a transaction is added to the blockchain, it becomes practically impossible to alter. The distributed nature of the ledger ensures that any attempt to change a transaction would require altering all subsequent blocks across the entire network, making it highly secure. This has made online banking and crypto currencies more secure and reliable. Similarly for voting, each vote can be recorded as a transaction on the blockchain, allowing for a transparent and auditable history of the election. Once a vote is recorded on the blockchain, it cannot be altered or tampered with.

However, scalability remains a significant hurdle as the transaction processing speed of many blockchain networks is currently limited, hindering their ability to handle a high volume of transactions. Interoperability issues persist, with different blockchain platforms often struggling to communicate effectively, limiting the seamless integration of decentralized systems. Energy consumption, especially in proof-of-work consensus mechanisms, raises environmental concerns, prompting a need for more sustainable alternatives.

The future of blockchain technology is poised for widespread integration across industries, with an emphasis on addressing scalability issues, improving interoperability between different networks, enhancing privacy features, and promoting sustainability. The rise of central bank digital currencies (CBDCs) and increased tokenization of real-world assets are expected trends, along with the development of more efficient governance models and regulatory frameworks.

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## **India's Healthcare Landscape: Challenges, Preparedness, and Economic Implications**

Healthcare is a fundamental aspect of any society, and in the case of India, it is a critical issue that requires urgent attention. With a population of over 1.3 billion people, India faces numerous challenges in its healthcare landscape, ranging from inadequate infrastructure and resources to accessibility and affordability. This essay seeks to examine the challenges present in India's healthcare landscape, the country's preparedness in addressing these challenges, and the economic implications of the current state of healthcare in India.

One of the primary challenges in India's healthcare landscape is the lack of adequate infrastructure and resources. According to a report by the World Bank, India ranks 184th out of 191 countries in terms of healthcare infrastructure. The shortage of hospital beds, medical professionals, and essential medical equipment makes it difficult for the country to meet the healthcare needs of its vast population. This inadequate infrastructure also contributes to poor quality of care and long waiting times for medical services, leading to increased morbidity and mortality rates. Furthermore, accessibility and affordability remain significant challenges in India's healthcare landscape. Many people, especially those in rural areas, have limited access to healthcare facilities and face significant barriers in reaching these facilities. Additionally, the high out-of-pocket expenses for healthcare services make it unaffordable for many individuals and families. As a result, millions of Indians are forced to forgo necessary medical treatment or resort to seeking care from unqualified practitioners.

In terms of preparedness, the Indian government has made some efforts to improve the healthcare system. Initiatives such as the National Health Mission, Ayushman Bharat, and the Pradhan Mantri Jan Arogya Yojana aim to provide universal healthcare coverage and strengthen primary healthcare services. However, these efforts have been hindered by inadequate funding, bureaucratic inefficiencies, and a lack of coordination between different levels of the healthcare system. As a result, the impact of these initiatives has been limited, and the healthcare system continues to face significant challenges.

The current state of healthcare in India has profound economic implications. The lack of accessible and affordable healthcare services not only affects the well-being of the population but also hampers economic growth. Poor health outcomes lead to reduced productivity, increased healthcare expenditures, and overall economic burden. Additionally, the out-of-pocket expenses for healthcare contribute to the cycle of poverty, as families are forced to spend a significant portion of their income on medical treatment, leaving them financially vulnerable. In conclusion, India's healthcare landscape is fraught with challenges that require urgent attention and action. The inadequate infrastructure, accessibility, and affordability of healthcare services pose a significant threat to the well-being and economic prosperity of the population. While the government has taken steps to address these challenges, much more needs to be done to strengthen the healthcare system and ensure universal access to quality healthcare. Addressing

these issues will not only improve the health outcomes of the population but also contribute to sustainable economic development in India.

**Divas Garg**  
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### Faculty Publications

- Dr. Ashima Kalra published book chapter on “Applications of Artificial Intelligence Across Industry 4.0” in Taylor & Francis.
- Dr. Ashima Kalra published book chapter on “Nature Inspired Computing for Optimization” in Taylor & Francis.

### Students Achievements

- **Saloni Kashyap** of B.Tech ECE got ISTE best student award.



- **Simarleen Maan** of B.Tech ECE got 2<sup>nd</sup> position in PTU Inter-Zonal elocution competition; 1<sup>st</sup> position in District level Debate competition (Mohali); 1<sup>st</sup> position- The Eloquent Speaker TPP GD competition - I'm the One



- **Bhupinder** of B.Tech ECE 5<sup>th</sup>sem got gold medal and trophy in PTU cross country event held from 12th oct -13th oct 2023.



### **Faculty/Student Certifications**

- The faculty of ECE department have received 30 + MOOC Swayam certifications.
- ECE department students have also got 45 Swayam certifications (45) and 200 + multiple MOOC course certifications.

### **Patents Filed**

- Patent filed by Dr. Pradeep K. Gaur on “Anti-Glare Light Shielding Apparatus For Vehicles”.
- Patent filed by Dr. Pradeep K. Gaur on “Water Rescue Assistive System”.
- Patent filed by Dr. Simarpreet Kaur on “Automated Fencing Installation System”.





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