CHANDIGARH
ENGINEERING COLLEGE
CGC, LANDRAN, MOHALI

Building Careers. Transforming Lives.

The Communiqué

(Capturing Moments, Preserving Memories)

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An Institution of Excellence

2025

www.cgc.edu.in

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.


The
Signature
Pages

Dr. Rajdeep Singh
Campus Director
CGC Landran, Mohali

Dear Students, Faculty, and Staff,

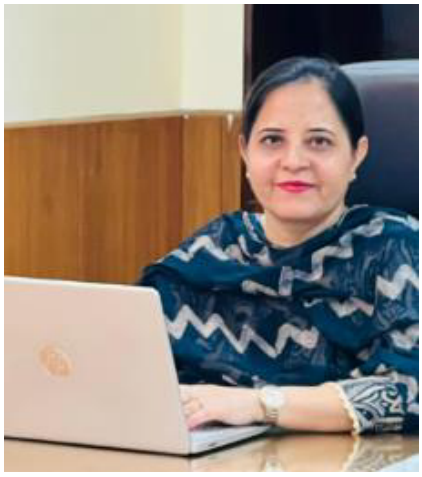
As I pen this message for our quarterly magazine, I am filled with a deep sense of pride and gratitude for everything this community has brought to life over the past few months.

Each quarter tells its own story — and this one has been particularly special. Our students have thrown themselves wholeheartedly into academics, technical pursuits, cultural performances, and sports, demonstrating time and again that excellence here is not confined to the classroom. Our faculty and staff have been the steady backbone of it all, nurturing talent, sparking curiosity, and keeping the spirit of this institution alive every single day.

This magazine is a testament to that spirit. Within these pages, you will find the voices, achievements, and experiences that have defined our quarter — stories worth telling and memories worth preserving. I encourage every reader to flip through these pages not just with pride, but with inspiration.

To our student contributors, editors, and everyone who worked behind the scenes to bring this edition to life — thank you. Publications like this one are what give our campus its heartbeat. As we look ahead to the next quarter, let us carry forward the momentum, the creativity, and the sense of community that makes this college truly unique.

Wishing you all continued success and fulfilment in your pursuits!



Dr. Amanpreet Kaur
Head-IT Department

Dear Colleagues and Students,

As we traverse another quarter, I am heartened by the intellectual vigor and collaborative spirit that pervades our corridors. The semester has yielded remarkable scholarly achievements—from groundbreaking research initiatives to innovative pedagogical endeavors that elevate our academic discourse.

This period reflects our collective commitment to excellence: faculty members advancing knowledge at the disciplinary frontier, students cultivating critical acumen, and staff fostering an environment where intellectual ambition flourishes. These endeavors do not occur in isolation; they represent the synergistic convergence of dedicated minds united in purpose.

Looking forward, we remain steadfast in our mission to transcend conventional boundaries, challenge prevailing assumptions, and nurture the next generation of thought leaders. The work ahead demands our continued dedication to rigor, integrity, and inclusivity.

I extend profound gratitude to everyone who contributes to our department's distinction. Your commitment to excellence enriches not merely our institution, but the broader intellectual landscape.

Onward, with purpose and passion.

Warm regards:
Dr. Amanpreet Kaur

From the Editor's Desk….

Dear Readers,

It gives me immense pleasure to present the 38th edition of *Communiqué*, the quarterly magazine of CEC-CGC. This edition highlights the vibrant academic, technical, cultural, and sporting events successfully organized during the quarter, along with the remarkable achievements and creative contributions of our students and faculty.

Through thought-provoking articles, research advancements, and noteworthy campus milestones, this edition exemplifies the culture of academic eminence, innovation, and intellectual perspicacity that defines our institution. It further illuminates the exceptional calibre of talent, creativity, and collaborative endeavour that continually propel our campus towards greater distinction.

Lastly, I extend my heartfelt appreciation to all contributors, editors, coordinators, and readers whose unwavering support and dedicated efforts have transformed this edition into a truly enriching and impactful publication.

Happy Reading!!!

Dr. Inderjot Kaur
Editor-in-Chief


CEC-CGC
RANKING &
AWARDS
2025
EXCELLENCE
PERFORMANCE
IMPACT

RANKING & AWARDS 2025

1 **Chandigarh Engineering College (CEC)-CGC Landran** has been **conferred** with the prestigious **Platinum Rating certification in the QS I-GAUGE College Ratings 2025. The detail is given below:**

- Teaching and Learning-Platinum
- Faculty Quality-Platinum
- Employability-Platinum
- Diversity and Accessibility-Platinum
- Facilities-Platinum
- Social Responsibility-Platinum
- Governance and Structure-Platinum
- Entrepreneurship-Platinum
- Innovation-Platinum

2 **Outlook I-Care Rankings 2025-India's Best Colleges**

- 50th Rank among top 200 private institutes in India.
- 2nd Rank among private institutes in Punjab including University's Institutes
- 1st Rank among private colleges in Punjab (excluding university's Institutes)

3 **India Today Ranking 2025**

- 1st Rank in Private Colleges in Punjab (Self-Financed).
- 52nd Rank across country's Private Colleges.
- 80th Rank across country's Private and Govt Colleges

4 **THE WEEK-Hansa Research Survey 2025**

- 1st Rank in Private College in Punjab (Self-Financed).
- 2nd Rank in Private Colleges (Including Universities) in Punjab.
- 62nd Rank in Govt and Private Institutes all Over India.
- 37th Rank in Private Colleges all over India.
- 8th in North Zone Govt and Private Colleges in all over India.

5 **Chandigarh Engineering College-CGC, Landran** has been ranked 7th in Punjab in the **Education World India Higher Education Rankings 2025-26** under the category **Private Engineering Institutes.**

6 **GHRDC Engineering College Survey 2025**

- Overall 11th Position in Ranking of Top Engineering Colleges in India.
- 4th Position in Ranking of Top Engineering Colleges of Emerging Super Excellence in India.
- 2nd position in Ranking of Engineering Colleges by State (Punjab).
- 5th position in Ranking of Engineering Colleges by Region (North).

7 Dataquest T School Rankings 2025

- 4th rank in the Northern Region.
- 13th rank among the Top Private T-Schools in India.
- 16th rank among Top 100 T-Schools (Government and Private) in India.
- 41st rank among Top 50 T-Schools (North Zone).

8 Chandigarh Engineering College-CGC Landran, Punjab, has been **selected for certification** under the prestigious **"Institution of Happiness (IOH)" project 2024** conducted by QS I-GAUGE.

9 NAAC A+ Grade obtained in March 2024

- CEC-CGC Landran has achieved NAAC A+ Grade by NAAC

10 Dataquest Tech School survey, 2024

- 1st in Punjab in Top 100 T-Schools (Overall) – Government and Private
- 1st in Punjab in Top T-Schools (Private)
- 5th rank in North India (Zone Wise)
- 12th rank in Top 100 T-Schools (Private)
- 17th rank in Top 100 T-Schools (Overall) – Government and Private

11 India Today Ranking 2024

- 7th In Top 10 Colleges with Best Value for Money (Private All Over India)
- 1st Rank in Private College in Punjab (Self-Financed)
- 57th Rank across country Private Colleges
- 85th Rank across country Private and Govt Colleges

12 DQ-CMR T-School Employability Index Survey 2024

- 13th Top 100 T-Schools (Factual Ranking) Employability Index
- 7th Top Private T-Schools (Factual Ranking)
- 7th in North Zone- Top 10 Zone Wise Institutes
- 90th in Top 100 T-Schools (Perceptual Ranking) Employability Index
- 16th in Regional Top 50 Ranking (North - Perceptual Ranking)

13 Outlook 2024

- 138th among top 160 private institutes in India

14 THE WEEK-Hansa Research Survey 2024

- 64th Rank in Govt and Private All Over India
- 38th Rank in Private Colleges In all over India
- 8th in North Zone Govt and Private Colleges in all over India

15 Times of India Engineering Survey 2024

- 141st in Top 175 Engineering Institute Rankings 2024

16 NIRF 2024 (Engineering Category)

- CEC-CGC Positioned in the band of 101-150 in the Engineering Category

17 NIRF 2024 (Overall Category)

- CEC-CGC Positioned in the band of 151-200 in the Engineering Category


SPECTRUM
OF
EVENTS

Celebrating Excellence: Annual Convocation Ceremony 2025

Chandigarh Engineering College (CEC), CGC Landran, celebrated its Annual Convocation Ceremony with immense pride and grandeur, marking a significant milestone in the academic journey of the graduating students. The occasion was graced by the Hon'ble Governor of Punjab, Sh. Gulab Chand Kataria, as the Chief Guest. The ceremony was presided over by Chairman, CGC and Member of Parliament (Rajya Sabha), S. Satnam Singh Sandhu, along with President CGC S. Rashpal Singh Dhaliwal, esteemed members of the CGC management, and Campus Director Dr. Rajdeep Singh. The Annual Report highlighting the institution's academic achievements, innovations, and milestones was presented by Director Principal Dr. Sukhpreet Kaur. The convocation witnessed the conferring of degrees upon the graduating B.Tech batches, celebrating their perseverance, accomplishments, and transition into the professional world.

The convocation ceremony stood as a testament to CEC's unwavering commitment to academic excellence, innovation, and holistic student development. Addressing the gathering, the dignitaries inspired the graduates to uphold values of integrity, dedication, and social responsibility while striving for excellence in their respective fields. The event resonated with an atmosphere of pride, joy, and accomplishment as students, faculty, and parents came together to celebrate years of hard work and determination. The ceremony concluded on a memorable note, leaving the graduates motivated to embark on new professional journeys and contribute meaningfully to society and the nation.

Hon'ble Governor of Punjab addressing the gathering

S. Satnam Singh Sandhu addressing the gathering

S. Rashpal Singh Dhaliwal addressing the gathering

Hon'ble Governor of Punjab being felicitated by CGC Management

Group photograph during Convocation

ECE Department organized an Expert talk on "Recent Trends in Automation"

The Department of Electronics and Communication Engineering organized an expert talk on "Recent Trends in Automation" on 24th December, 2025 at Chandigarh Engineering College, CGC-Landran. The session offered valuable insights into Industry 4.0, smart manufacturing, along with real-world industrial applications. Students learned about essential skills and career opportunities in the automation sector and engaged in an interactive Q&A with Mr. Manoj Gupta, AGM, Mitsubishi Electric. This inspiring session strengthened academia-industry collaboration and prepared future engineers for the automation revolution. An insightful expert talk exploring Industry 4.0, smart manufacturing, and real-world automation practices. It offered valuable insights into emerging industrial trends, bridged the gap between theoretical knowledge and practical application, and motivated students to align their skills with evolving industry demands, fostering innovation, adaptability, and professional readiness.

Glimpse of Expert talk on "Recent Trends in Automation"

CSE Department organized Technical Workshop on "Machine Learning"

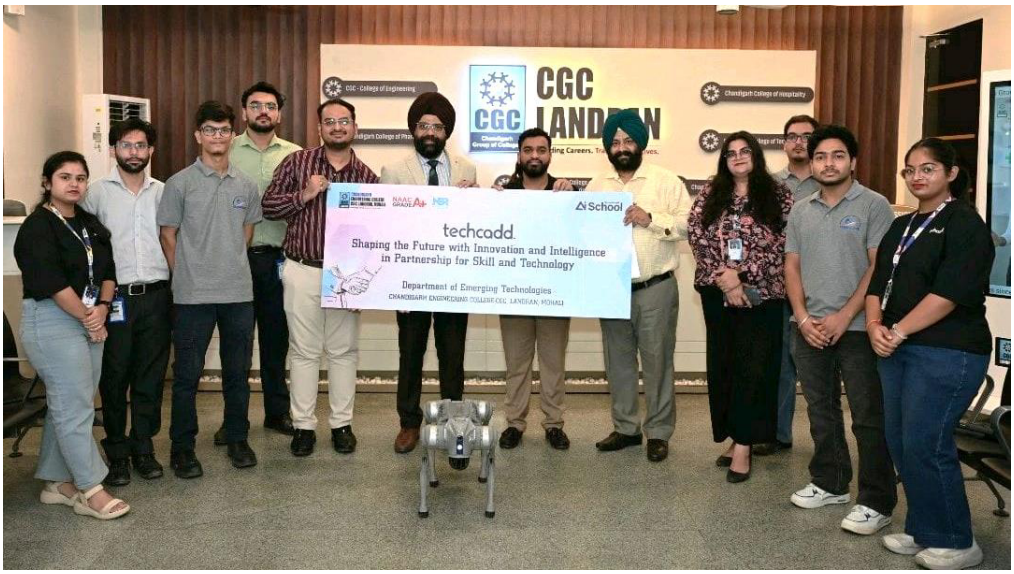
The ACM chapter of the Department of Computer Science, CEC-CGC Landran organized one-day Machine Learning Workshop on 8th October 2025. The primary objective of the workshop was to enhance students' understanding of modern Artificial Intelligence (AI) and Machine Learning (ML) techniques, emphasizing their implementation and real-world applications. Mr. Shivansh Pandey Software Engineer, Sensation Software Solutions delivered insightful sessions on Machine Learning concepts and guided participants through practical implementation exercises. During the workshop, participants explored topics such as data-driven decision making, pattern recognition, and algorithmic learning. They also took part in hands on practice sessions, where they implemented basic ML algorithms on sample datasets using popular tools and libraries. The interactive sessions encouraged teamwork, innovation, and curiosity among students toward AI and data science research.

Mr. Shivansh Pandey delivering the session

Speaker interacting with the students

Department of Emerging Technologies organized AI Unleashed: The Robotics Showcase

AI Unleashed – The Robotics Showcase was organized at Chandigarh Engineering College (CGC), Landran, Mohali on 10th October, 2025 by the Department of Emerging Technologies, in collaboration with TechCADD Chandigarh. The event focused on exploring the integration of Artificial Intelligence and Robotics through expert talk (by Gourav Gupta), student projects, live demonstrations, showcases of AI-powered robotics using sensors, cameras, and LiDAR.



AI Unleashed – The Robotics Showcase

Expert Session on AI's role in modern robotics and future

Emergians Club Outreach Initiative

As a prelude to Parivartan 2K25, the Emergians Club of the Department of Emerging Technologies, CGC Landran, conducted an outreach visit to Satluj Public School. Club members showcased working models and innovative projects, introducing students to practical applications of emerging technologies. The interactive session sparked curiosity and enthusiasm while also highlighting the vision of Parivartan—creativity, innovation, and transformative learning—reflecting the club's commitment to community engagement and knowledge sharing. The outreach was carried out under the guidance and support of Dr. Rajdeep Singh (Campus Director), Dr. Kapil Mehta (Head of Department), and Ms. Ramanpreet Kaur Mann (Assistant Professor); whose encouragement played a vital role in the successful execution of this initiative.

Visit to Satluj Public School

Faculty & Club Members addressing the students

IT Department organized Expert Session on “Offsec: From the Eyes of Hacker”

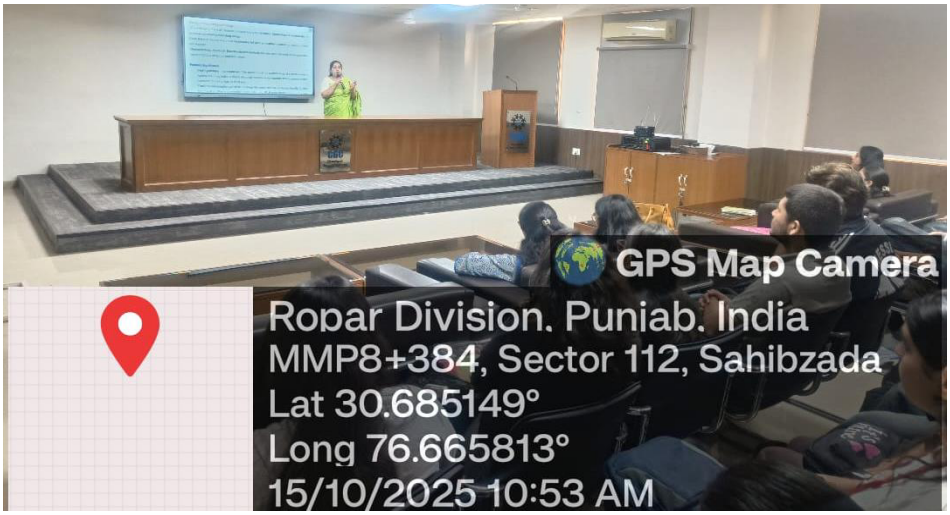
The Department of Information Technology, CEC-CGC Landran, organized an expert session “Offsec: From the Eyes of Hacker” on 1st October, 2025. The session featured Mr. Lovejot Singh Chhabra, Founder & Director of Cyber Defense Intelligence, who shared deep insights into cybersecurity from a hacker’s perspective, helping students understand offensive security for stronger ethical defense. The session was successfully coordinated by Faculty Coordinator Ms. Shallu Mehta and concluded with a memento presentation and group photograph.

Faculty members and students attending the session

Speaker getting appreciation by Head of the Department

Expert Lecture on Stereochemistry held on 15th October 2025

An engaging and insightful lecture on Stereochemistry was delivered by Dr. Kashma Sharma, a Postdoctoral Fellow from the Department of Chemistry, DAV College, Sector 10, Chandigarh, affiliated with Panjab University, on 15 October 2025 at Chandigarh Engineering College, Mohali. The session was organized for the students and faculty of the Department of Applied Sciences. Specializing in the synthesis, processing, and characterization of bio-based and biodegradable polymers, Dr. Sharma elaborated on the significance of stereochemistry and its vital role in the field of medicine, particularly in pharmaceuticals. She explained how understanding the three-dimensional arrangement of molecules is essential for designing effective and safe drugs. The lecture was further enriched with relatable real-life examples, which kept the audience deeply engaged throughout.

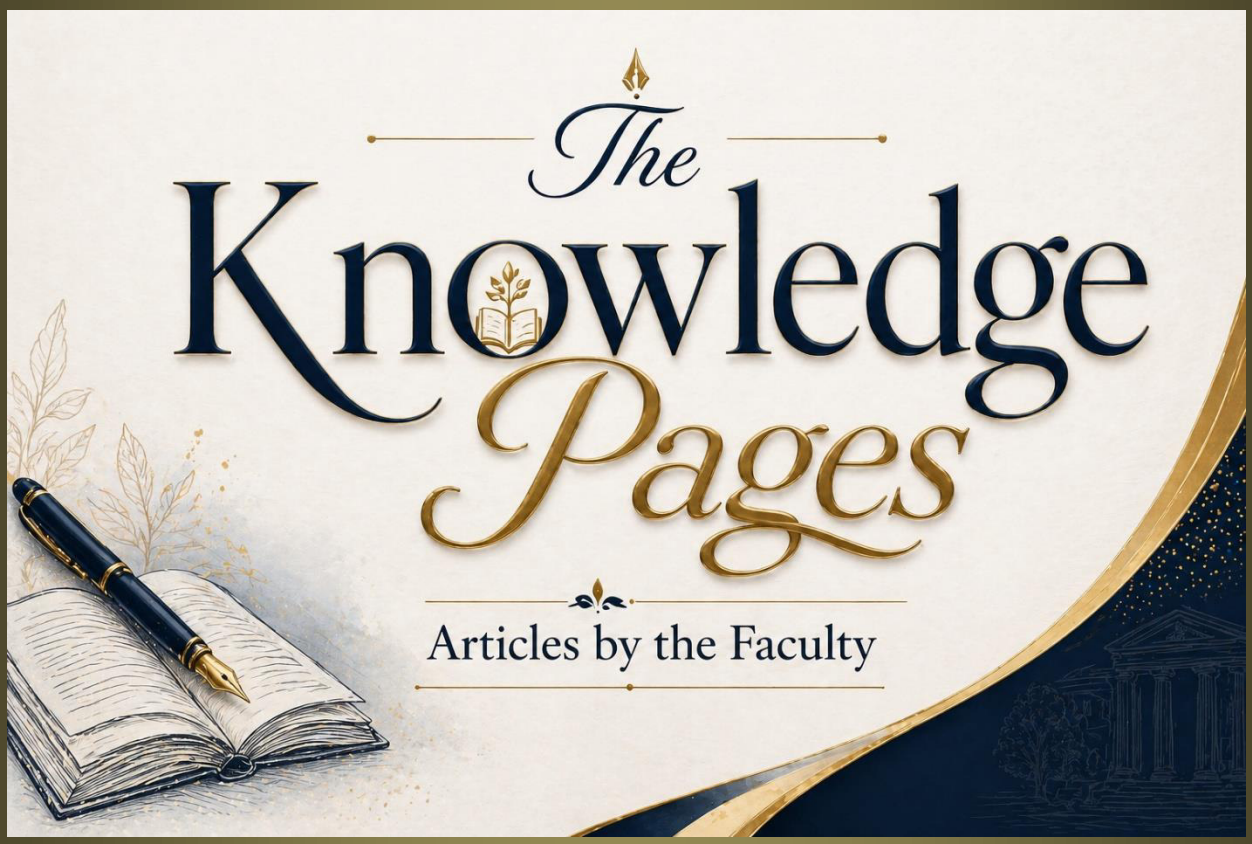


Glimpse of Dr. Kashma delivering the Lecture

Industrial Visit to Grazitti Interactive

The Department of Information Technology, CEC-CGC, Landran, Mohali in collaboration with the Institution's Innovation Council (IIC) at CGC Landran, organized an insightful industrial visit to Grazitti Interactive, a renowned global digital innovation and marketing technology company. This initiative aimed to bridge the gap between academic learning and real-world industry practices by providing students with direct exposure to current technological trends and workplace dynamics. During the visit, students had the opportunity to interact with industry experts and gain valuable insights into some of the most in-demand technologies shaping the IT landscape today. Key focus areas included Full Stack Development, Salesforce, Quality Assurance Automation (QA Automation), and the rapidly evolving field of Generative AI. Experts shared real-world applications of these technologies, their relevance in various business scenarios, and career pathways associated with each.

Speaker addressing the students at Grazitti


The
Knowledge
Pages
Articles by the Faculty

Renewable Energy as a Step Towards a Greener Future

Article by: Dr. Rachna Manchanda
Professor, ECE Department

The increasing demand for energy due to population growth, urbanization, and industrial development has placed immense pressure on natural resources. For many years, fossil fuels such as coal, oil, and natural gas have been the primary sources of energy, leading to serious environmental problems including climate change, air pollution, and resource depletion. These challenges highlight the urgent need for a sustainable energy alternative, making renewable energy a crucial solution for meeting present needs without harming the environment.

Renewable energy sources such as solar, wind, hydroelectric, biomass, and geothermal energy are naturally replenished and produce minimal greenhouse gas emissions. Unlike fossil fuels, they do not significantly pollute the air or contribute to global warming. By adopting renewable energy, countries can reduce their carbon footprint, improve air quality, and protect ecosystems. Clean energy also helps promote better public health by lowering pollution-related diseases.

Apart from environmental benefits, renewable energy strengthens energy security and supports economic growth. Since renewable resources are widely available and locally accessible, dependence on imported fuels can be reduced. The renewable energy sector also creates employment opportunities in manufacturing, installation, and maintenance, encouraging technological innovation and sustainable development.

In conclusion, renewable energy is an integral part of a greener future. Despite challenges such as high initial costs and storage limitations, advances in technology and supportive policies have made renewable energy more affordable and practical. Embracing renewable energy ensures long term environmental protection, economic stability, and a sustainable future for generations to come.

Electronics and Communication Engineering: Building the Framework of Modern Technology

Article by: Dr. Pooja Sahni
Professor, ECE Department

Constructing the Structure of Contemporary Electronics and Communication Technology The technological underpinnings of the modern world are largely shaped by engineering. This discipline has a profound impact on modern living, from sophisticated medical equipment and clever automation to common communication technologies. Its strength is its capacity to translate abstract ideas into workable methods that address issues in the actual world. Continuous innovation and research have propelled the development of electronics. Performance, dependability, and energy efficiency have all greatly increased with the transition from discrete components to highly integrated semiconductor devices. Compact yet potent systems supporting high-speed communication, data processing, and control applications have been made possible by advancements in microelectronics and VLSI architecture. These developments serve as the foundation for technologies like satellite communication and mobile networks.

Alongside electronics, communication engineering has advanced to meet the increasing need for dependable and quick information sharing. To maintain accuracy and efficiency, modern communication systems include sophisticated modulation techniques, signal processing techniques, and error control measures. Engineers are increasingly concentrating on boosting bandwidth, lowering latency, and enhancing system robustness due to the rise of wireless technologies and optical communication. Electronics and communication engineering research is becoming more and more multidisciplinary. To improve system performance, signal processing methods are being integrated with data analytics and machine learning. To overcome physical constraints in device scalability, new materials and fabrication techniques are being investigated. In addition to advancing technology, this kind of study creates new possibilities in fields including smart infrastructure, healthcare electronics, and renewable energy systems.

A solid grasp of basics is still crucial for students and aspiring engineers. Advanced technologies are based on concepts like circuit theory, semiconductor physics, and communication principles. In addition, research-based learning and hands-on experience foster creativity and critical thinking. In response to shifting societal demands, electronics and communication engineering is still evolving. In addition to developing technology, engineers in this sector support inclusive and sustainable growth. They contribute significantly to the development of systems that promote advancement and enhance quality of life by fusing technical expertise with accountability and creativity.

“Life Is Beautiful: A Journey Through Hope, Simple Joys, Inner Strength, and the Meaning Found in Everyday Moments”

Article by: Ms. Ekta Kamboj
Assistant Professor
Department of Emerging Technologies

Life is beautiful because it is a mix of small moments, lessons, emotions, prosperity, abundance that shape who we are. Every sunrise gives us a new chance to start again, to dream, to grow, to listen, to fulfil desires. Happiness does not always come from big achievements; often, it lives in simple things like a warm smile, a kind word, or quiet time with loved ones. Even challenges and failures add beauty to life, as they teach us patience, strength, and resilience. Life also becomes meaningful when we help others and share joy and sorrow together. Nature, relationships, and personal achievements remind us that every day has something special to offer. When we learn to be grateful for what we have instead of worrying about what we lack, life feels more colorful and peaceful. Truly, life is beautiful when we choose to see hope, love, and purpose in every moment.

As a kid, we enjoy the small moments of life, like having a softy, toffee and all small things that gives taste like heaven. Just imagine you are sitting under a tree, a small breeze is blowing and you just close your eyes to feel the touch of that small breeze flow. This experience is really one of the most beautiful things. The time we spend doing our favourite activities is the best time we ever missed. Like suppose now you are thirty-five plus year adult and obviously you have so many talents when you were in school but as you become grow in life these all things are actually become closed in a box of memories which we never ever opened. So, to live life we should open the memories box once in a while and enjoy the moment.

With my perspective, age is just a number. If you consider yourself young enough to enjoy the moment to explore your hobbies especially when you were in childhood is the most precious thing and make your present moment full of life. Materialistic things often attract people and it needs too but but but …… The main thing depends what gives you real happiness, it matters. Sometimes we should travel to nearby place to get some moments of peace, some went to temple, some went for shopping and some went for just long rides and drives just to make ourselves happy. The moment you realize that this is the life which you are really living in the moment is the Actual Life.

The plans you made for future is also a part of life and we should plan because it gives focus for planning of life we are planning to lead a life . But my point of view is that what the life is the real moment in which you are present now….

As a child, I was one of the favourite student of my teachers not because of studies but because of extra activities I used to do i.e singing, dancing, speaking, making new ideas to explore the things. As a badminton player I realize that what you actually want to achieve in life, you have to make yourself disciplined and bound to the regularity of things to make them really possible for you. Hostel life is the part of my life since school time. The things I learn is really inspiring that how I used to manage my monthly expense since from school age , how to make yourself independent and make yourself happy with friends or without friends. Basically you will become happy when happiness came from inside it actually never ever depends on things. Sometimes a scoop of ice- cream gives you more smile on your face that an I -phone cannot. So it really matters what gives you real happiness to lead a beautiful life.

So in the end , I will conclude with the thought that " Life is the journey really designed by your own thoughts, actions and your thinking and perspective to see the things". May be the thing you are considering not wonderful , FOR OTHERS that thing may be a magic. So everyone has a very different perspective. People judge, points and speaks about their thoughts on every moment and time. Kindly consider it always that what you perceive , that you will get. So to lead a wonderful and prosperous life just keep the thoughts in your mind which stables your life and make you keeping distance from the things which never gives that peace which you actually deserve.

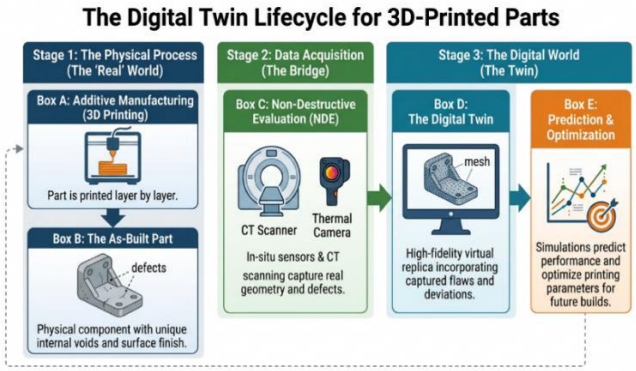
The Digital Mirror: Predicting Fatigue Life in 3D-Printed Parts

Article by: Dr. Narinder Kumar, Associate Professor
Department of Mechanical Engineering

In the evolving landscape of mechanical engineering, the integration of Digital Twins with Additive Manufacturing (AM) represents a paradigm shift in quality assurance. As industries increasingly rely on 3D printing for critical load-bearing components from aerospace brackets to biomedical implants, the challenge has shifted from simply "making" parts to "validating" them. This is where the concept of a Digital Twin becomes revolutionary: a real-time virtual replica that does not just mirror a part's geometry but simulates its future behavior under stress. Traditionally, predicting the fatigue life of a manufactured part involved destructive testing of sample coupons, assuming they represent the final product. However, Additive Manufacturing introduces unique complexities. Microscopic voids, residual stresses from rapid heating and cooling, and surface roughness can vary drastically between builds or even within a single part. These inconsistencies act as initiation points for cracks, making traditional, uniform predictions unreliable.

A Digital Twin addresses this by acting as a living simulation. The process begins during or immediately after printing, where non-destructive evaluation (NDE) techniques—such as in-situ optical cameras, thermal sensors, or CT scanning—feed real-world data into the digital model. Instead of assuming a perfect geometry, the Digital Twin incorporates the part's actual "as-built" condition, including every detected pore or surface irregularity. This geometric data is then fused with computational mechanics, specifically fracture mechanics algorithms. The Digital Twin simulates how a crack might initiate from a detected microscopic void and propagate through the material's unique microstructure under cyclical loading. By running these simulations on the specific defects present in that specific part, engineers can predict the number of cycles until failure (fatigue life) with a fidelity previously impossible.

Ultimately, Digital Twins for Additive Manufacturing close the loop between design and reality. They allow us to answer the critical question: "This specific part, with its specific imperfections, is still safe for how long?" By merging the physical and digital worlds, we are not just printing parts; we are printing data, and that data holds the key to unlocking the full potential of 3D printing in safety-critical applications.



Artificial Intelligence and Machine Learning: Transforming the Modern World

Article by: Ms.Mandeep Kaur (Assistant Professor)

CSE Department

In the 21st century, **Artificial Intelligence (AI)** and **Machine Learning (ML)** have emerged as transformative technologies that are reshaping industries, economies, and daily life. From voice assistants to self-driving cars, AI systems are becoming increasingly integrated into modern society. This article explores the concepts, working principles, applications, advantages, and challenges of AI and ML.

1. What is Artificial Intelligence?

Artificial Intelligence refers to the simulation of human intelligence in machines that are programmed to think, learn, and make decisions. The term was first introduced by John McCarthy in 1956 during the Dartmouth Conference. AI systems are designed to: Learn from experience, Adapt to new inputs, Perform tasks that normally require human intelligence and Solve problems logically.

AI can be broadly classified into:

- **Narrow AI (Weak AI)** – Designed for specific tasks (e.g., chatbots, recommendation systems)
- **General AI (Strong AI)** – Hypothetical AI that can perform any intellectual task like a human.

2. What is Machine Learning?

Machine Learning is a subset of AI that enables systems to learn automatically from data without being explicitly programmed. Instead of following fixed instructions, ML algorithms identify patterns in data and improve their performance over time.

There are three main types of Machine Learning:

- **Supervised Learning** – Uses labeled data (e.g., spam email detection).
- **Unsupervised Learning** – Finds hidden patterns in unlabeled data (e.g., customer segmentation).
- **Reinforcement Learning** – Learns through rewards and punishments (e.g., game-playing AI).

3. How Machine Learning Works: The basic working process of ML involves:

- **Data Collection** – Gathering relevant data
- **Data Preprocessing** – Cleaning and organizing data
- **Model Selection** – Choosing an algorithm (e.g., decision tree, neural network)
- **Training** – Feeding data to the model
- **Testing and Evaluation** – Measuring accuracy
- **Deployment** – Using the model in real-world applications

The quality of data plays a crucial role in determining the model's performance.

4. Applications of AI and ML: AI and ML are widely used in various sectors:

- **Healthcare** – Disease diagnosis, medical imaging analysis
- **Finance** – Fraud detection, risk assessment
- **Education** – Personalized learning systems
- **Transportation** – Autonomous vehicles
- **E-commerce** – Recommendation systems

Blockchain Technology: Revolutionizing Digital Trust

Article by: Ms. Sukhdeep Kaur (Assistant Professor)
CSE Department

In today's digital world, ensuring secure and transparent transactions is a major challenge. **Blockchain technology** has emerged as a ground breaking solution that enables secure data exchange without relying on a central authority. Initially developed as the underlying technology for cryptocurrencies, blockchain is now transforming industries such as finance, healthcare, supply chain, and governance.

1. What is Blockchain?

Blockchain is a **distributed digital ledger** that records transactions across multiple computers in a secure and tamper-resistant manner. Instead of storing data in a single central server, blockchain distributes copies of the ledger across a network of computers called *nodes*.Each record in the blockchain is stored in a **block**, and these blocks are linked together in chronological order to form a **chain**. Once data is added to the chain, it cannot be easily altered, ensuring integrity and transparency.

The concept of blockchain gained global attention with the launch of Bitcoin in 2009 by the pseudonymous creator Satoshi Nakamoto.

2. Key Features of Blockchain

1. **Decentralization** – No single authority controls the network.
2. **Transparency** – Transactions are visible to all participants in the network.
3. **Immutability** – Once recorded, data cannot be modified easily.
4. **Security** – Cryptographic techniques protect data from unauthorized access.

3. How Blockchain Works

The working process of blockchain typically includes:

1. **Transaction Initiation** – A user requests a transaction.
2. **Verification** – Network nodes validate the transaction using consensus mechanisms (e.g., Proof of Work or Proof of Stake).
3. **Block Creation** – Verified transactions are grouped into a block.
4. **Block Addition** – The block is added to the existing blockchain.
5. **Completion** – The transaction becomes permanent and visible on the ledger.

Consensus mechanisms ensure that all participants agree on the validity of transactions.

4. Types of Blockchain

- **Public Blockchain** – Open to everyone (e.g., Ethereum network).
- **Private Blockchain** – Controlled by a single organization.
- **Consortium Blockchain** – Managed by a group of organizations.

Each type serves different purposes depending on security and access requirements.

5. Applications of Blockchain

Blockchain technology is being applied in multiple sectors:

- **Finance** – Secure digital payments and cross-border transactions
- **Supply Chain Management** – Tracking goods from production to delivery
- **Healthcare** – Secure storage of medical records
- **Voting Systems** – Transparent and tamper-proof elections
- **Smart Contracts** – Self-executing contracts with predefined conditions

For example, smart contracts on platforms like Ethereum automatically execute agreements without intermediaries.

6. Advantages of Blockchain

- Reduces fraud and data tampering
- Enhances transparency
- Eliminates intermediaries
- Increases efficiency
- Improves traceability

7. Challenges and Limitations

Despite its benefits, blockchain faces several challenges:

- High energy consumption (especially Proof of Work systems)
- Scalability issues
- Regulatory uncertainty
- Technical complexity
- Integration with existing systems

Addressing these challenges is essential for wider adoption.

8. Future of Blockchain

The future of blockchain looks promising with developments in:

- Decentralized Finance (DeFi)
- Non-Fungible Tokens (NFTs)
- Central Bank Digital Currencies (CBDCs)
- Improved consensus algorithms

Governments and enterprises are exploring blockchain solutions to enhance security and transparency in digital operations.

Conclusion: Blockchain technology represents a major shift in how digital transactions and data are managed. By providing decentralization, security, and transparency, it has the potential to transform various industries. Although challenges remain, continuous innovation and regulatory clarity will likely drive its growth in the coming years.

AI and Human Feelings: Where Technology Meets Emotion

Article by: Ms.Harjinder Kaur (Assistant Professor)
IT Department

Artificial Intelligence (AI) is now a part of our everyday life. From smartphones and social media to online learning and virtual assistants, AI helps us in many ways. As this technology grows, an important question arises: can AI understand human feelings?

Can AI Feel Emotions?

AI does not have feelings like humans do. It cannot feel happiness, sadness, love, or pain. However, AI can recognize emotions by studying patterns. It analyzes words, voice tone, facial expressions, and online behavior to guess how a person might be feeling.

For example, an app may suggest relaxing music when you seem stressed, or a chatbot may respond kindly when you sound upset. AI is trained using data—it responds based on logic, not emotions.

Why Do Humans Feel Connected to AI?

Even though AI cannot feel, many people feel comfortable talking to it. This is because AI listens without judging and is always available. For some students, AI becomes a helpful study partner or a source of guidance.

But this connection is different from human relationships. Humans feel emotions because of real experiences, memories, and relationships. AI only understands emotions through data, not life experiences.

Where AI Is Helpful

AI can be useful in many emotional areas:

Helping students manage stress

Supporting mental health awareness

Making communication easier

Providing quick help and information

However, AI cannot replace real human care. A machine cannot truly understand pain or share happiness the way another person can.

The Need for Balance

AI is a powerful tool, but emotions make us human. Technology should support our lives, not control them. While AI can help us understand emotions better, human connection, empathy, and kindness are irreplaceable.

Conclusion

AI is smart and useful, but feelings belong to humans. As students living in a digital age, it is important to use technology wisely while valuing real emotions and relationships. In the end, AI can assist the mind—but only humans understand the heart.


FACULTY
ACHIEVEMENTS

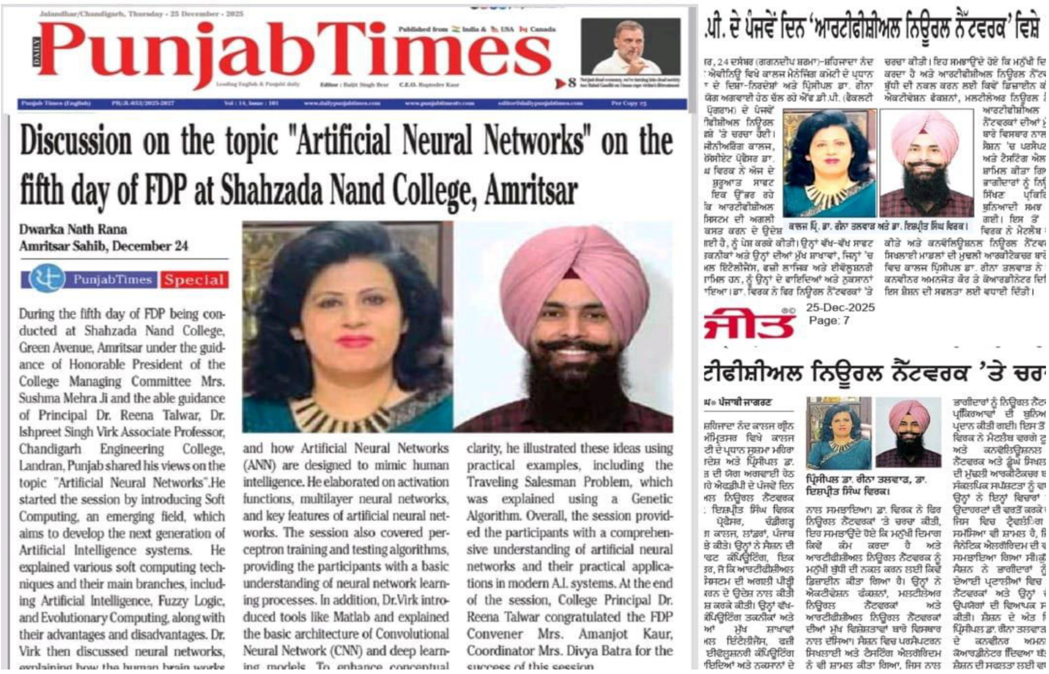
Faculty Achievements

- **Ms. Anita Rani Devgan from** the Department of Electronics and Communication Engineering had a remarkable achievement in the NPTEL course "Essential Mathematics for Machine Learning" conducted during July– October 2025. She successfully earned an Elite certification with an outstanding consolidated **score of 98%, placing her among the Top 1% performers across the country. The course, offered by IIT Roorkee under the SWAYAM–NPTEL initiative,** is known for its rigorous academic standards. Her excellent performance reflects her strong analytical skills and dedication to academic excellence.

- **Dr. Bhawna Tandon** from the Department of Electronics and Communication Engineering had a remarkable achievement in the NPTEL course for her exceptional performance in control engineering (July–October 2025). She achieved **a Gold Elite score of 90% and was among the "Top 5% toppers.**" The course was offered by the Indian Institute of Technology Madras under the **SWAYAM–NPTEL** initiative and is known for its academic rigor. This accomplishment reflects her strong subject expertise and dedication to continuous professional development. The department appreciates her commitment to academic excellence and extends heartfelt congratulations.

Faculty Achievements

❖ **Dr. Ishpreet Singh Virk**, faculty member in Emerging Technologies Department, has been featured in the renowned newspaper **Punjab Times** for his insights into Artificial Intelligence. The feature highlights his discussion on **Artificial Neural Networks**, a key domain of AI that replicates human learning processes. The session focused on recent advancements in the field and their practical applications across various industries. This recognition underscores Dr. Virk's **academic expertise** and reflects the institution's continued emphasis on **research, innovation**, and **emerging technologies**.



Jalandhar/Chandigarh, Thursday - 25 December - 2025

Punjab Times

Discussion on the topic "Artificial Neural Networks" on the fifth day of FDP at Shahzada Nand College, Amritsar

Dwarka Nath Rana
Amritsar Sahib, December 24

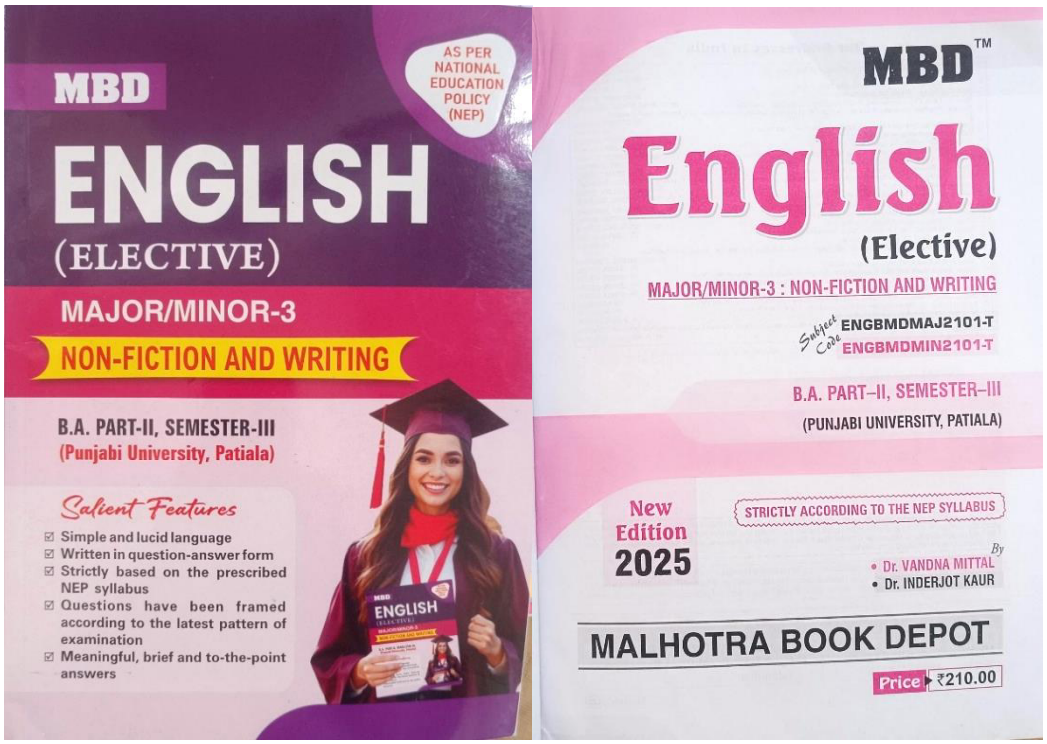
PunjabTimes Special

During the fifth day of FDP being conducted at Shahzada Nand College, Green Avenue, Amritsar under the guidance of Honorable President of the College Managing Committee Mrs. Sushma Mehra Ji and the able guidance of Principal Dr. Reena Talwar, Dr. Ishpreet Singh Virk Associate Professor, Chandigarh Engineering College, Landran, Punjab shared his views on the topic "Artificial Neural Networks".He started the session by introducing Soft Computing, an emerging field, which aims to develop the next generation of Artificial Intelligence systems. He explained various soft computing techniques and their main branches, including Artificial Intelligence, Fuzzy Logic, and Evolutionary Computing, along with their advantages and disadvantages. Dr. Virk then discussed neural networks, explaining how the human brain works and how Artificial Neural Networks (ANN) are designed to mimic human intelligence. He elaborated on activation functions, multilayer neural networks, and key features of artificial neural networks. The session also covered perceptron training and testing algorithms, providing the participants with a basic understanding of neural network learning processes. In addition, Dr.Virk introduced tools like Matlab and explained the basic architecture of Convolutional Neural Network (CNN) and deep learning models. To enhance conceptual clarity, he illustrated these ideas using practical examples, including the Traveling Salesman Problem, which was explained using a Genetic Algorithm. Overall, the session provided the participants with a comprehensive understanding of artificial neural networks and their practical applications in modern A.I. systems. At the end of the session, College Principal Dr. Reena Talwar congratulated the FDP Convener Mrs. Amanjot Kaur, Coordinator Mrs. Divya Batra for the success of this session.

25-Dec-2025
Page: 7

Faculty Achievements (Publications)

- **Dr. Inderjot Kaur, Associate Professor of English** in the **Department of Applied Sciences**, authored *MBD English (Elective/Non-Fiction & Writing)*, a comprehensive book aligned with the Punjabi University, Patiala, Bachelor of Arts syllabus, published in December 2025. The work reflects her deep expertise in language pedagogy and instructional design, offering students a structured and accessible approach to elective English studies. Since its release, the book has gained remarkable traction in academic circles, surpassing 1,500 copies in sales — a testament to its relevance, clarity, and value as both a classroom resource and a self-study guide for students and aspiring professionals alike.



Faculty Achievements (Patents Granted)

Application Number- 201711016437
Patent Number- 572877
Date of Patent Grant - 29/10/2025
Title- Biometric Ticking System
Inventors: Dr Mohit Srivastava, Dr Birajashis Pattnaik, Abhishek Goel, Navjot Singh, Tasawwur Ahmad, Nikhil Jindal, Manish Negi

INTELLECTUAL PROPERTY INDIA

क्रम सं/SL. No. 011223424

पेटेंट कार्यालय,भारत सरकार
पेटेंट प्रमाण पत्र
(पेटेंट नियमावली का नियम 74)

The Patent Office, Government Of India
Patent Certificate
(Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No.	:	572877
आवेदन सं. / Application No.	:	201711016437
फाइल करने की तारीख / Date of Filing	:	10/05/2017
पेटेंटी / Patentee	:	chandigarh group of colleges
आविष्कारकों का नाम /Name of Inventor(s)	:	1.Dr. Mohit Srivastava 2.Dr. Birajashis Pattnaik 3.Abhishek Goel 4.Navjot Singh 5.Tasawwur Ahmad 6.Nikhil Jindal 7.Manish Negi

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित *Biometric Ticketing System* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख मई 2017 के दसवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled *Biometric Ticketing System* as disclosed in the above mentioned application for the term of 20 years from the 10th day of May 2017 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख : 29/10/2025
Date of Grant :

पेटेंट नियंत्रक
Controller of Patents

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, मई 2019 के दसवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 10th day of May 2019 and on the same day in every year thereafter.

Faculty Achievements (Patents Granted)

Application Number- 201611016383
Patent Number- 571647
Date of Patent Grant - 07/10/2025
Title - Electricity Generation System
Inventors: Dr. Ruchi Singla, Surinder Singh, Nitin Sharma, Vishal Gupta, Shikha Chawla

क्रम सं/SL No :011223008

INTELLECTUAL PROPERTY INDIA

पेटेंट कार्यालय,भारत सरकार | The Patent Office, Government Of India

पेटेंट प्रमाण पत्र | Patent Certificate

(पेटेंट नियमावली का नियम 74) | (Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No.	:	571647
आवेदन सं. / Application No.	:	201611016383
फाइल करने की तारीख / Date of Filing	:	11/05/2016
पेटेंटी / Patentee	:	Chandigarh Group of Colleges
आविष्कारकों का नाम /Name of Inventor(s)	:	1.Dr. Ruchi Singla 2.Surinder Singh 3.Nitin Sharma 4.Vishal Gupta 5.Shikha Chawla

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित *ELECTRICITY GENERATION SYSTEM* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख मई 2016 के ग्यारहवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled *ELECTRICITY GENERATION SYSTEM* as disclosed in the above mentioned application for the term of 20 years from the 11th day of May 2016 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख : 07/10/2025
Date of Grant :

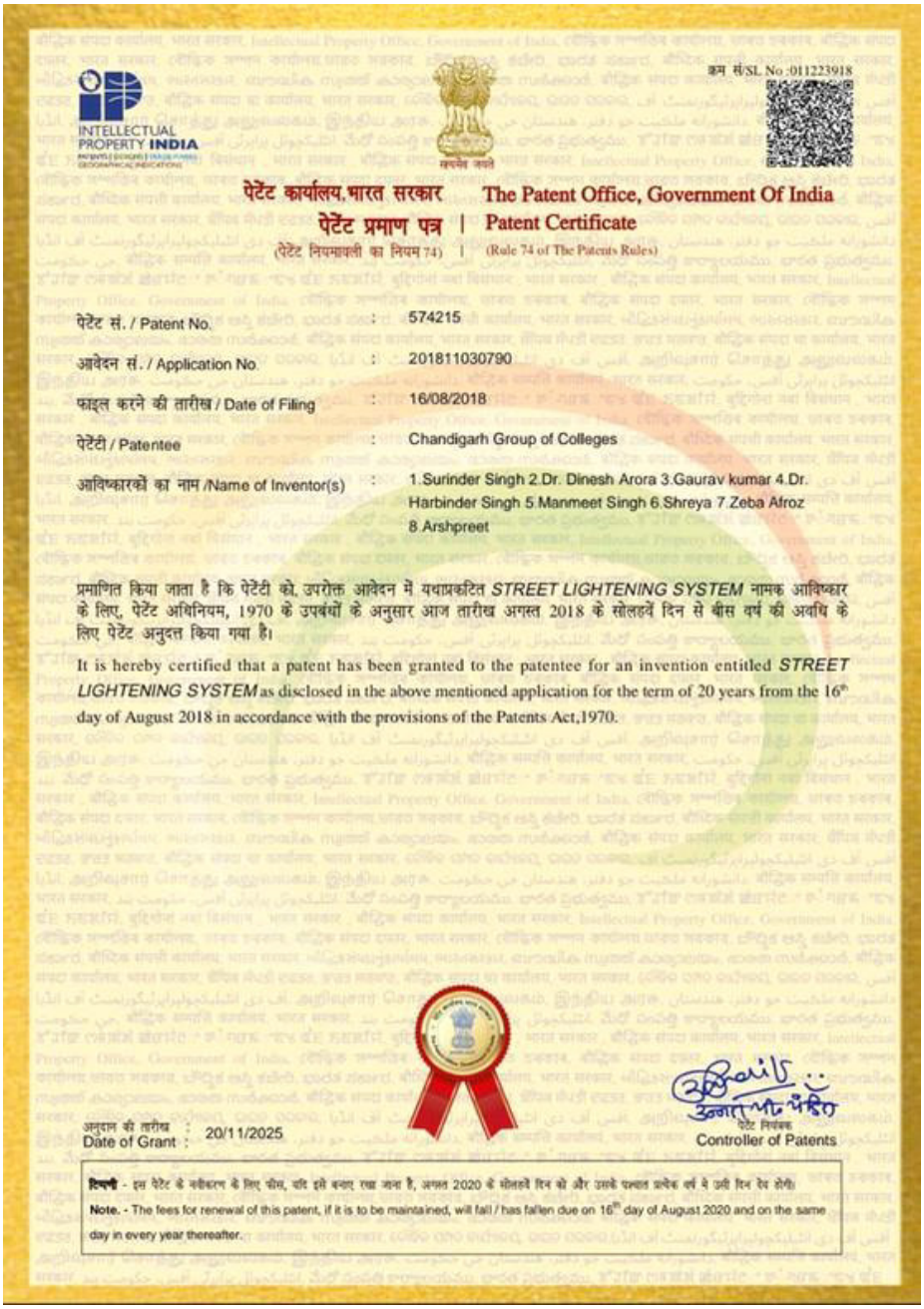
पेटेंट नियंत्रक
Controller of Patents

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, मई 2018 के ग्यारहवें दिन को और उसके पश्चात प्रत्येक वर्ष मे उसी दिन देय होगी।

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 11th day of May 2018 and on the same day in every year thereafter.

Faculty Achievements (Patents Granted)

Application Number - 201811030790
Patent Number - 574215
Date of Patent Grant - 20/11/2025
Title - Street Lighting System
Inventors: Surinder Singh, Dr. Dinesh Arora, Gaurav Kumar, Dr. Harbinder Singh, Manmeet Singh, Shreya Zeba Afroz, Arshpreet



INTELLECTUAL PROPERTY INDIA

क्रम सं/SL. No :011223918

पेटेंट कार्यालय,भारत सरकार | The Patent Office, Government Of India

पेटेंट प्रमाण पत्र | Patent Certificate

(पेटेंट नियमावली का नियम 74) | (Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No.	:	574215
आवेदन सं. / Application No.	:	201811030790
फाइल करने की तारीख / Date of Filing	:	16/08/2018
पेटेंटी / Patentee	:	Chandigarh Group of Colleges
आविष्कारकों का नाम /Name of Inventor(s)	:	1.Surinder Singh 2.Dr. Dinesh Arora 3.Gaurav kumar 4.Dr. Harbinder Singh 5.Manmeet Singh 6.Shreya 7.Zeba Afroz 8.Arshpreet

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित *STREET LIGHTENING SYSTEM* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख अगस्त 2018 के सोलहवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled *STREET LIGHTENING SYSTEM* as disclosed in the above mentioned application for the term of 20 years from the 16th day of August 2018 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख : 20/11/2025
Date of Grant :

पेटेंट नियंत्रक
Controller of Patents

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, अगस्त 2020 के सोलहवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 16th day of August 2020 and on the same day in every year thereafter.

Faculty Achievements (Patents Filed)

- **A Smartwatch for Child Safety, Learning Assistance and Real-Time Health Monitoring** - Invented by **Ms. Nidhi Chahal, Dr. Simarpreet Kaur, Ms. Preeti Bansal, Dr. Ramanpreet Kaur, Dr. Varsha Sood, Rajnish Kumar, Rishika, Sachin Kumar, Tinu Kumar Anand and Tanish Bhangu**; (Application No. 202511093195, CBR No. CBR547).

- **An Advanced Remote Ignition Activation System Providing Automated Access to the Vehicle** - Invented by **Ms. Nidhi Chahal, Dr. Simarpreet Kaur, Ms. Preeti Bansal, Dr. Ramanpreet Kaur, Dr. Varsha Sood and Tanish Bhangu;** (Application No. 202511094814, CBR No. CBR418).

- **Smart Electric Bicycle with Integrated Safety and Energy Management System** - Invented by **Nidhi Chahal, Dr. Simarpreet Kaur, Preeti Bansal, Tanish Bhangu and Rajneesh Kumar;** (Application No. 202511079574, CBR No. CBR458).

- **Sustainable Cold Mix for Wet-Condition Road Surface Repair** - Invented by **Dr Pooja Sahni, Ekta Sandhu, Rachna Manchanda, Dr Sukhdeep Kaur;** (Application No.: 202611001580, CBR No. CBS500).

- **A Heat Reflective Photovoltaic Panel for Building Integration -** Invented by **Dr Simarpreet Kaur, Ms Nidhi Chahal, Ms Preeti Bansal, Rajnish, Tinu Anand Kumar, Sachin Yadav, Reshika;** (Application No. 202611001582, CBR No.: CBS53)


STUDENTS
ACHIEVEMENTS
Dream. Dedicate. Achieve.
CERTIFICATE
OF ACHIEVEMENT
Our Pride,
Our Future.
AWARDS
ACADEMICS
SPORTS
LEADERSHIP
INNOVATION

Students Achievements

- **Kartik, a student of B,Tech ECE 3rd semester** showcased exceptional athletic talent by winning **Gold medal in Chandigarh State Weightlifting Championship** on 12th October 2025 bringing pride to the college through strength discipline dedication and competitive spirit.

CHANDIGARH AMATEUR WEIGHTLIFTING ASSOCIATION

(AFFILIATED WITH INDIAN WEIGHTLIFTING FEDERATION AND CHANDIGARH OLYMPIC ASSOCIATION)
(RECOGNISED BY THE CHANDIGARH SPORTS COUNCIL)
(REGISTERED UNDER SOCIETIES ACT, 1860)

Sr. No. 477

Chandigarh Amateur Weightlifting Association

CERTIFICATE OF HONOUR

This is to certify that KARTIK S/o, D/o SARWAN KUMAR
of PSC has secured 1st Place, weight
class 60 Kg. in the 28th Jr. Chandigarh State Weightlifting Championship
held at WLC-42 on the 12-10-25
Body Weight 53.20 Kg.

WEIGHT LIFTED

Snatch 45 Kg.
C. & Jerk 50 Kg.
Total 95 Kg.

(GENERAL SECRETARY)

(PRESIDENT)

Students Achievements

- **Rohit, a student of B,Tech ECE 5th semester** showcased exceptional strength and sportsmanship by securing **Gold Medal** at the Intercollege PTU Powerlifting Competition held on 30th October 2025 at GNDU, Ludhiana.

- **Nikhil, a student of B,Tech ECE 5th semester** showcased commendable strength and sportsmanship by securing the **Bronze Medal** in the 60 kg weight category at the PTU Inter-College Weightlifting Event held on 30th October 2025.

Students Achievements

- **Anshika Bakshi, a student of B,Tech ECE 5th semester has been appointed as Campus Ambassador for Cognizance 2026. She** secured an offer letter as **Campus Ambassador for Cognizance** 2026 which is the Annual Technical Festival of IIT Roorkee, effective from 29th December 2025 to 15th March 2026.

- **Emerging Technologies Department** proudly celebrates the remarkable achievement of **Vedant** and **Shivaan** for their outstanding performance in **Shooting Sports**. Both students have been selected to **represent I.K. Gujral Punjab Technical University** (IKGPTU) in the **Inter-College All India University Shooting Tournament**, for competing in the **10m Air Pistol event**. This achievement reflects their high level of technical skill, discipline, and consistency in competitive shooting. Further adding to their success, Vedant and Shivaan secured the **Best Shooter Award** during the selection trials conducted at the **SVIET Campus, Banur**.

Students Achievements

- **Nikhil Jawla, student of B.Tech. IT Department**, 3rd Semester **bagged 1st Position in IKGPTU inter College Kabaddi tournament** held on 17th October, 2025

- **Madhur, student of B.Tech IT** 5th Semester **bagged 2nd Position in Hockey tournament** held at Sector 42 hockey Stadium, Chandigarh on 11th October, 2025

Students Achievements

- **Saket Jain, student of B.Tech. 5th Semester** bagged **1st Position in TPP CareerSprint 2K25**, held at CEC-CGC Block 3 on 14th October, 2025.

- **Murari Kumar, student of 7th Semester** bagged **1st position Volley Ball tournament** held at CGC Landran.

Students Achievements (Placements)

The students of CEC-CGC achieved remarkable placements and internships with reputed organizations such as Coding Ninjas, Nokia Student Hackathon, Ashok Leyland, Bhanzu and Realty Assistant Pvt. (Viraaj Ventures Group) securing impressive package up to 8.2 LPA.

S.No.	U.ID.	Name	Name of Company	Package (LPA)	PPO & Package	Internship Amount
1	2237638	Anurag Kashav	Coding Ninjas	8	Internship & Placement	25K
2	2237272	Shoba Chauhan	Coding Ninjas	8	Internship & Placement	25K
3	2237277	Shyna Garg	Nokia Student Hackathon	8.2	Internship & Placement	25K
4	2239858	Ankit Mondal	Ashok Leyland	7.5	Internship & Placement	40K
5	2237096	Abhinav Kumar	Bhanzu	7	Placement	NA
6	2237299	Vijender Walia	Realty Assistant Pvt.(Viraaj Ventures Group)	7.2	Placement	NA

STUDENTS SECTION


STUDENT
EDITORS
CGC
LANDRAN
Arpan Sood
Darshpreet Kaur
Mohammad Sahil
Kartik Narang
Charu
Yogansh Rathi
CGC
LANDRAN
Building Careers.
Transforming Lives.

PEN & PERSPECTIVES

(ARTICLES BY STUDENTS)

System Design

Introduction: System design is the process of defining the architecture, components, modules, interfaces, and data for a system to meet specific requirements. In software engineering, it plays a vital role in building scalable, reliable, and efficient applications. System design occurs after requirement analysis and before implementation. It focuses on how a system will be built, not what the system will do. Popular systems like Google, Netflix, Amazon, and WhatsApp depend on solid system design principles to handle millions of users at once.

Types of System Design

High-Level Design (HLD)-High-level design is an important phase that outlines the overall architecture of a system. It provides a broad view of how different components interact with one another. HLD emphasizes what components are needed and how they communicate rather than internal implementation details. It serves as a blueprint for developers during implementation and helps stakeholders grasp the system structure.

Low-Level Design (LLD)-Low-level design is a detailed phase that focuses on the internal workings of individual components. It comes after high-level design and before coding. LLD describes how each module will be implemented in terms of classes, methods, data structures, and algorithms. It translates the system architecture defined in HLD into specific design specifications for developers to follow. LLD clarifies logic, data flow, and interactions within a module.

Key Components of System Design

Load Balancing-Load balancing spreads incoming user requests across multiple servers to avoid overloading a single server. It enhances system availability and performance. Load balancers use algorithms like round-robin or least connections to manage traffic efficiently.

Caching- Caching stores frequently accessed data in fast memory to lessen database load and boost response time.

Microservices Architecture-Microservices architecture breaks an application into small, independent services that communicate through APIs. Each service can be developed, deployed, and scaled on its own. This approach enhances scalability, flexibility, and fault isolation compared to monolithic architectures.

CAP Theorem-The CAP theorem states that a distributed system can guarantee only two of the following at any time: consistency, availability, and partition tolerance.

Security-Security protects systems from unauthorized access and data breaches. It includes authentication, authorization, and encryption of sensitive data. Secure system design ensures data confidentiality, integrity, and availability, which is crucial for maintaining user trust and compliance.

Conclusion: System design is a key concept in software engineering that helps turn ideas into real-world applications. A well-designed system is scalable, reliable, secure, and easy to maintain. As applications increase in size and complexity, system design becomes even more essential.

Nivedna
B.Tech CSE

Understanding Transformers: The Backbone of Modern LLMs

Introduction:

In recent years, Artificial Intelligence has made enormous progress in natural language processing (NLP) - from translating languages in real time to writing essays, generating images, and powering chatbots. At the heart of many of these breakthroughs lies a powerful architecture called the **Transformer**. Introduced by researchers at Google in 2017 in the paper **"Attention Is All You Need,"** the Transformer architecture changed how machines process language and other sequential data.

Before Transformers: The Limitations of Earlier Models

Before Transformers, most Natural Language Processing (NLP) systems relied on models like Recurrent Neural Networks (RNNs), Long Short-Term Memory networks (LSTMs), and GRUs and these models processed text **word by word in sequence**, creating major challenges:

Key Problems

- Slow Training: Step-by-Step approach limited parallelization on modern hardware.
- Weak Long-range Understanding: Distant dependencies were difficult to capture.
- Poor Scalability; Efficient scaling to massive data and compute was not possible.

Transformers overcame these challenges by **processing all tokens at once** using attention-based mechanism.

What Is a Transformer?

A Transformer is a neural network architecture that works with sequential data, such as text, by using multi-head self-attention to understand how different parts of the input are related to each other at the same time. It turns the input into rich, context-aware representations using stacked encoder and decoder layers, without relying on step-by-step processing or convolutional operations.

Consider a sentence like "The cat on the table sleeps"—self-attention helps the model instantly link "cat" to "sleeps," even if words are far apart. Transformers use stacked layers of encoders (to understand input) and decoders (to generate output), creating rich representations of data.

Brief Working Concept: Transformers work by calculating how much each word should "pay attention" to others, creating a web of weighted connections across the input.

Self-Attention: Self-Attention allows each token to attend to all the previous tokens, helping to resolve coreferences and maintain context throughout the sequence.

Multi-Head Attention: Within self attention layer, multiple attention heads work in parallel. Each head focuses on different types of relationship and their results are combined to produce a more complete understanding.

How Transformer LLMs Process Input and Generate Output

- Tokenization: Raw text is split into smaller units called tokens for processing.
- Transformer Blocks: Stacked attention layers refine token representations using context.
- Language Model(LM) Head: Final layers convert representations into probabilities over next tokens.
- Generation: Tokens are produced iteratively using decoding strategies like greedy or sampling.

Advantages of Transformers: Transformers shine through their simplicity, speed, and power to grasp deep connections effortlessly.

- **Parallel Power**: Unlike sequential models, they handle entire sequences simultaneously with techniques like KV caching (storing keys and values) , slashing training time dramatically.
- **Global View**: Attention reaches anywhere in the input instantly, excelling at long-range links that others miss.
- **Versatile Scaling**: Easy to stack deeper or widen, adapting to massive data while maintaining clarity.

Conclusion: The Transformer architecture—with its attention-based design, parallel processing capabilities, and continual refinements—has unlocked unprecedented performance in natural language tasks and reshaped the modern AI landscape. Its foundations now support increasingly powerful systems focused on real-world applications such as creative generation, knowledge assistance, and decision-making. Therefore, understanding Transformers is a crucial step towards working with advanced language models.

Nimanpreet Kaur
Roll No: 2336950
B.Tech CSE

The Silent Struggles of Engineering Students

Engineering students are often seen as hardworking and successful, but behind this image they face many silent struggles. Academic pressure is one of the biggest challenges, as students are expected to perform well in exams, labs, and projects. This constant pressure can lead to stress, anxiety, and loss of confidence. Managing time is another major difficulty. Balancing classes, assignments, projects, and personal life becomes exhausting. Many students feel overwhelmed but hesitate to share their problems due to fear of judgment. Social and emotional issues such as competition, self-doubt, and imposter syndrome also affect students' mental well-being. Financial problems further increase stress, especially for students from limited economic backgrounds. Despite these challenges, engineering students continue to work hard and adapt. They develop skills like problem solving, teamwork, and resilience, which help them grow both academically and personally. With proper support systems such as counseling, mentorship, and a supportive learning environment, institutions can help students overcome these silent struggles and achieve overall growth.

Rhythum Rana
B.Tech ECE
3rd Semester

Cloud Computing

Introduction

Cloud computing is the delivery of computing services such as servers, storage, databases, networking, and software over the internet. Instead of maintaining physical hardware and infrastructure, organizations can access resources on demand through cloud service providers. In modern software engineering, cloud computing plays a crucial role in building flexible, scalable, and cost-effective applications. It eliminates the need for heavy upfront investment in hardware and allows businesses to scale resources based on demand. Popular platforms such as online streaming services, e-commerce websites, and collaborative tools rely on cloud computing to serve millions of users globally.

Types of Cloud Computing

Public Cloud

The public cloud is owned and managed by third-party service providers who deliver computing resources over the internet. These services are shared among multiple users. Public cloud solutions are cost-effective and suitable for startups and small businesses.

Private Cloud

A private cloud is dedicated to a single organization. It offers greater control, customization, and security compared to the public cloud. Large enterprises often prefer private clouds for handling sensitive data and critical operations.

Hybrid Cloud

A hybrid cloud combines both public and private cloud environments. It allows organizations to keep sensitive workloads in a private cloud while using the public cloud for less critical tasks. This model offers flexibility and balanced resource management.

Key Components of Cloud Computing

Virtualization: Virtualization enables multiple virtual machines to run on a single physical server. It improves resource utilization and reduces infrastructure costs.
Scalability: Cloud platforms allow automatic scaling of resources based on user demand, ensuring consistent performance.
Security: Cloud security includes data encryption, identity management, and network protection to safeguard information from cyber threats.

Pay-As-You-Go Model

Users pay only for the resources they consume, making cloud computing economically efficient.

Conclusion

Cloud computing has transformed the way modern applications are developed and deployed. It provides scalability, flexibility, and cost savings while supporting innovation. As digital transformation continues, cloud computing remains a fundamental technology for building reliable and future-ready systems.

Bharat Kalia
B.Tech CSE

Who we are Becoming?

There is a moment that arrives quietly for most students. It does not come with an exam, a result, or a deadline. It comes unexpectedly during a slow walk across campus, while sitting alone in the library, or late at night when the noise of the day finally fades. In that moment, a different question appears, one that has nothing to do with marks or careers: Who am I becoming through all of this?

College begins with goals. Get good grades. Build skills. Secure opportunities. Do well. Somewhere along the way, these goals multiply, and the chase becomes intense. Days are spent trying to meet expectations some external, some self-imposed. Progress is measured in achievements, not awareness.

Yet growth is happening in quieter ways.

Students learn how they respond to pressure. They notice how they treat others when stressed. They recognize what excites them and what drains them. Slowly, values take shape not from lectures, but from experience. Integrity, patience, resilience, empathy these qualities develop when plans don't go as expected.

Ambition plays a powerful role. It pushes students forward, but without reflection, it can also exhaust them. Success feels meaningful only when it aligns with something deeper than comparison or approval. Many students realize that chasing everything leads to losing themselves. College, then, becomes less about reaching a destination and more about becoming aware of the journey.

There are moments of clarity, followed by confusion. Moments of confidence, followed by doubt. This fluctuation is not failure it is growth. Identity is not formed in certainty; it is shaped through questioning. What students often don't realize until later is that this phase is teaching them how to live with uncertainty, how to define success personally, and how to balance ambition with well-being. These lessons remain long after degrees are earned and careers begin.

One day, students will leave campus carrying more than certificates. They will carry perspective. They will remember the pressure, the doubts, the late nights, and the small moments of realization. And they will understand that college did not just prepare them for a job. It prepared them to become thoughtful, self-aware individuals.

That is the growth that truly lasts.

Anshika Bakshi
B.Tech ECE
5th Semester

Boudhik Sampadha (Intellectual Property) and Student Innovation

Boudhik Sampadha is also known as Intellectual Property (IP) refers to creations of the human mind for example inventions, designs, artistic works, and new technologies. It provides legal rights to creators so that the ideas and innovations are protected from being copied or used without permission of the inventor. These days (innovation-driven world) Intellectual Property plays an important role in supporting creativity and technological development.

For students, understanding Intellectual Property is very important because many new ideas and projects are developed during studying in college. If these ideas are protected, they can become valuable inventions, startups, or business ideas in the future.

Importance of Boudhik Sampadha for Students:-

•Protects original ideas, inventions, and creative work.

•Encourages innovation and research among students.

•Provides legal recognition to the creator or inventor.

•Helps students to convert projects into patents or startups ideas.

•Supports economic growth through innovation

Types of Intellectual Property

Patents – Protection for new inventions or technologies.:-

•Copyrights – Protection for books, music, software, and other creative works.

•Trademarks – Protection for brand names, logos, and symbols.

•Design Rights – Protection for the visual design of products.

Support for Students

Educational institutions play an important role in promoting awareness about Intellectual Property. Colleges organize workshops, seminars, and training programs to help students understand how to protect their ideas and innovations.

Students studying at Chandigarh Group of Colleges Landran in Mohali are supported in this scheme by the Center of Boudhik Sampadha under the ACIC RISE Association department. This center helps students understand IP Rights and provides guidance and support for protecting their ideas and research work. In conclusion, Boudhik Sampadha encourages creativity and innovation among students. if provided with proper awareness and institutional support students can protect their ideas and contribute to technological.

Charanjit Singh
B.Tech ME

Robotics in Manufacturing: The Intelligent Revolution of Modern Industry

Manufacturing has always been the most important part of industrial growth, but it is changing very quickly right now. Robots are making factories faster, smarter, and more efficient. Robotics in manufacturing isn't just about machines taking over human work. It's the start of a new era of smart production where speed, accuracy, and automation all work together to make high-quality goods. Robots help factories work better and faster behind the scenes, making things more efficient every day in modern factories now.

One of the most important things that robots do in manufacturing is make things faster and more accurately. Industrial robots are programmed to do things like welding, assembly, painting, and packaging repeatedly with amazing accuracy. Robots can work for long hours without getting tired or losing concentration, which is different from humans. As a result of this, the work remains the same every time and fewer mistakes are made. This helps the factories to run smoothly and produce quality products quickly.

Also, robots have an advantage because they can work in places that are dangerous for humans. They can manipulate harmful substances and perform demanding tasks in global industries like automotive or electronics. This ensures that workers remain safe and minimizes accidents while also completing the job effectively. This helps keep workers safe and reduces accidents while completing the work efficiently.

Advanced technologies like AI, machine vision, and smart sensors are also helping robotics come up with new ideas. Robots today can look at data, find things, and change what they do based on what's happening right now. Collaborative robots are designed to work alongside humans, combining people's creativity and decision-making skills with robots strength and precision to create a more efficient and collaborative work environment together. This combination creates a space where people and machines work together smoothly, getting more done.

As industries are moving forward to smart factories and Industry 4.0, robots are going to be a major part of the future of manufacturing. They will help automated systems work better, become smarter, and connect easily with other machines. This will change the way products are made, designed, and delivered around the world.

Robotics in manufacturing is not simply about machines doing the work of humans. Instead, it is about building a smarter and safer future with many new opportunities for industries.

Karan Tayal
B.Tech ME

The Invisible Engineers Behind Everyday Life

Many people visualize engineering as working on machines, but it actually has many applications in our lives and can be much more fascinating than what people may think. For example: How do we wake up every morning? At least 1 mechanical item helps us wake up, whether it's through the sound of an alarm clock, the air movement of a fan or the ability for air conditioning to create a temperature for us in a bedroom.

What about our means of transportation with something that we see regularly; a bicycle? You may only see 2 wheels and a frame when you look at one, but a bicycle incorporates many elements, including balance, force, and energy transfer while you are moving. The bicycle has many different components working together to allow an individual to travel long distances while expending only minimal effort or energy. Some of these include: chain, gears, and brakes.

This is just one example of how the principles of engineering are at work in our day to day lives. There are many modes of transportation that demonstrate these principles, whether it is an automobile, a plane, an elevator or a ride at an amusement park; they all use the same principles of motion and force and rely on the use of materials to create a working system. So the next time you ride a bicycle, watch a train pass by, or notice how smoothly an elevator moves, take a moment to think about the ideas behind it. You might realize that the world around us is full of hidden engineering waiting to be discovered.

Deepak Slathia

B.Tech ME

The Brain is A Pattern Hunting Machine

I used to believe that humans are logical beings who occasionally make mistakes. The more I learned about neuroscience, the more I realized how wrong that assumption was. In reality, we are pattern hunters first and rational thinkers later. The brain does not wait patiently for facts; it rushes to find meaning.

From the earliest moments of life, the brain begins organizing chaos. Sounds become language, shapes become faces, repeated experiences become expectations. This ability to detect patterns is the foundation of intelligence. Without it, learning would be impossible. Every skill we acquire reading, problem-solving, recognizing people depends on pattern recognition.

But this powerful ability comes with a cost.

The brain evolved in environments where uncertainty was dangerous. If something moved in the bushes, assuming it was a predator even if it wasn't was safer than ignoring it. Over thousands of years, the brain learned a simple rule: it is better to see a false pattern than to miss a real one.

That instinct still operates today.

This is why we see faces in clouds, meaning in coincidences, and intention where none exists. It explains superstitions, lucky numbers, conspiracy theories, and endless overthinking. When events feel random, the brain becomes uncomfortable. It fills the gap with stories. Order feels safe. Chaos feels threatening.

In the modern world, this survival feature often works against us. Social media, news cycles, and algorithms exploit our pattern seeking nature. When an idea is repeated often enough, it begins to feel true. When two events occur together, we assume one caused the other. Familiarity replaces evidence.

The brain does not ask, "Is this accurate?"

It asks, "Does this fit what I already believe?"
Understanding this changed how I view my own thoughts. Not every connection deserves trust. Not every assumption deserves belief. Awareness becomes a filter between instinct and intelligence.

The brain hunts patterns to protect us but growth begins when we learn to question the stories it creates.

Sumit Pathak
B.Tech AIML
6th Semester

Polar Lights: The Science Behind Nature's Light Show

Most of us have experienced a moment when we looked at the sky and felt small yet curious. Imagine looking up on a quiet night and seeing the sky glow with moving waves of green, red, and purple light. It feels almost unreal, like nature is putting on a show just for those who pause long enough to watch. These glowing lights are called polar lights, or auroras. Auroras may look magical, but they are created by simple and fascinating science that connects the Sun and the Earth.

How Polar Lights Begin

The story of polar lights starts with the Sun. The Sun constantly sends out tiny charged particles into space. This flow of particles is known as the solar wind. Most of the time, we do not notice it at all. When these particles reach Earth, they meet the planet's magnetic field, which acts like a protective shield around us. Instead of letting the particles hit Earth directly, the magnetic field guides them toward the North and South Poles.

What Happens in the Sky

As the charged particles travel toward the poles, they enter the upper part of Earth's atmosphere. There, they collide with gases such as oxygen and nitrogen. These collisions give energy to the gas atoms. When the atoms release this energy, they produce light. This light is what we see as glowing patterns in the night sky. In the Northern Hemisphere, this phenomenon is called the Aurora Borealis, while in the Southern Hemisphere it is known as the Aurora Australis.

Why Auroras Have Different Colors

The beautiful colors of polar lights depend on the type of gas involved and how high the collision happens. Green light, the most common color, is produced by oxygen at lower heights. Red light comes from oxygen at higher altitudes. Blue and purple shades are created by nitrogen. Because the Sun's activity and atmospheric conditions keep changing, every aurora looks different. No two displays are ever exactly the same.

Why the Lights Seem to Move

Auroras often look like flowing curtains or slow-moving waves. This happens because the charged particles enter the atmosphere along narrow paths controlled by Earth's magnetic field. As solar activity changes, these paths shift, making the lights appear to dance across the sky.

Why Polar Lights Matter

Polar lights are not just beautiful to watch. They help scientists understand how energy from the Sun affects Earth. Strong auroras often appear during solar storms, which can influence satellites, GPS signals, and communication systems that we use in everyday life. By studying auroras, scientists learn more about space weather and how it impacts our modern world.

A Simple Reminder

Polar lights remind us that Earth is constantly connected to the Sun through invisible forces of energy and magnetism. What looks like a magical light show is actually science happening high above us, every second of the day. Sometimes, all it takes is looking up at the sky to realize that science is not only in textbooks or laboratories. It is right there above us, lighting up the night.

Muskan Garg
B.Tech AIML

From Classroom to Career : Building Skills for the Future

In today's competitive professional world, academic marks alone are no longer enough to ensure career success. While classroom learning builds a strong theoretical foundation, it is the development of practical skills that truly prepares students for real-world challenges. The transition from classroom to career requires a balanced combination of knowledge, skills, and adaptability.

One of the most essential skills for students is **effective communication**. The ability to express ideas clearly, participate in discussions confidently, and present thoughts professionally plays a crucial role in career growth. At CGC Landran, students are encouraged to enhance their communication skills through presentations, seminars, group discussions, and interactive classroom activities. These experiences help build confidence and prepare students for professional environments.

Problem-solving and critical thinking are equally important. Unlike examinations, real-life situations do not provide direct answers. CGC Landran promotes analytical thinking through project-based learning, case studies, workshops, and hands-on activities. Such exposure enables students to approach challenges logically and develop practical solutions, which are highly valued in today's job market.

In an era of rapid technological advancement, **adaptability and continuous learning** have become vital. CGC Landran supports skill enhancement by offering industry-oriented training, certification programs, internships, and expert-led workshops. These initiatives help students stay updated with emerging trends and equip them with relevant skills required in modern careers.

Teamwork and leadership are also emphasized through group projects, technical clubs, student societies, and co-curricular activities. These platforms allow students to collaborate, take responsibility, and develop leadership qualities essential for professional growth. Additionally, managing academics alongside extracurricular involvement helps students develop **time management and discipline**, creating a strong work ethic.

CGC Landran strongly focuses on the **holistic development** of students by combining academic excellence with skill-based learning. Through career guidance sessions, placement training, and continuous mentoring, the institution prepares students to face future challenges with confidence.

In conclusion, while marks may open the door to opportunities, it is skills that help students grow and succeed in their careers. With the supportive and skill-oriented environment at CGC Landran, students are empowered to transform classroom learning into meaningful and successful professional journeys.

Disha Pathak
B.Tech CSE-IOT

Forged In Resistance

Some struggles are not quiet. They do not come as polite exclusion or gentle oversight. They come as relentless opposition. Every question, every challenge, every interaction is designed to drain you. It is not debate. It is not conversation. It is a coordinated, almost desperate resistance - as if the very purpose of those around you is to make you falter. In these moments, fatigue becomes heavy. Energy is siphoned not by the weight of effort, but by the constant pressure of people whose aim is singular: to oppose. Their motives are clear, unspoken yet pervasive. They do not care about ideas. They do not care about merit. Their hurdle is you ~ your presence, your integrity, your refusal to conform. Every word you speak, every step you take, is met with subtle obstruction, direct challenge, or passive hostility. But that's what matters, if a huge crowd is opposing you, it means they fear your sheer potential. We are actually closer to bring change at this point when we might feel such enormous resistance.

The mind strains. The body tires. Yet, in the face of this deliberate resistance, something remarkable forms. Standing firm becomes an act of defiance. Persisting becomes a testament. Speaking, acting, existing despite it ~ these are the victories that no one applauds. Each act of endurance sharpens clarity. Each moment of refusal hardens resolve. Even when recognition seems distant, like being finally acknowledged in a debate hall filled with capable peers, the fire of persistence is already forging strength.

Take the club interviews. You enter with experience, vision, and readiness to contribute. But independence and courage make others uncomfortable. One interviewer, aware of pressures from influential members, leans aside in a corner and murmurs: *"We can't hire you because you got a rebellious past, with enormous amount of fight history with all, else we really wanted you because of your experience and skills."* The words are blunt, almost painful ~ an acknowledgment of your worth, yet a deliberate exclusion. It is the kind of resistance that could shake anyone. Yet you do not flinch. You do not bow. You do not compromise. You persist, holding your integrity above acceptance.

Then came the debate, where exhaustion took an entirely different form. The opponents were not typical debaters but a group of questioners. They refused to debate normally. Instead, they turned the discussion into an endless Q&A cycle, asking one question after another, never giving answers themselves, never letting the exchange feel like a debate. Their goal was clear: make you the cause of any stagnation, force you to exhaust your energy, and challenge you until your focus wavered.

The topics themselves ~ atheism, misogynism ~ were heavy and emotionally charged. Each question, each trap, each twist tested your mind and your resolve. Every word was scrutinized, every pause magnified, every rebuttal challenged. And yet, through it all, your preparation, clarity, and courage held firm. Each rebuttal, every argument, every assertion became an act of defiance against their manipulative design.

And then, finally, recognition arrived. At Youth Fest, among dozens of capable representatives from multiple colleges, I secured first position in debate. The room, once tense with opposition, now acknowledged my skill, presence, and persistence. Triumph was not just applause; it was proof that endurance through deliberate opposition, manipulative questioners, and mentally draining topics forges strength that cannot be denied.

The contrast is sharp. One environment resists everything about you; another celebrates your ability. Triumph does not erase the struggle, but it validates every act of persistence, every defiance, every step taken without compromise. Those who endure this duality ~ facing deliberate opposition, manipulative peers, draining debate topics, and calculated resistance,

yet refusing to vanish or yield - are not merely resilient. They are tempered, sharpened, and unyielding. They carry within them the knowledge that persistence is stronger than rejection, that courage cannot be diminished by hostility, and that recognition, when it comes, is earned through enduring forces designed to break you entirely.

Jashan Bansal
B.Tech AI-DS

Impact of Technology and Artificial Intelligence on Human Life

Technology has been an essential part of human progress for centuries, but its influence has grown significantly with the rise of artificial intelligence. In today's world, technology and AI are deeply embedded in daily life, shaping how people communicate, access information, and interact with society. Smartphones, the internet, and social media platforms have made communication faster and more convenient, allowing people to stay connected across long distances. AI-powered tools such as voice assistants, chat bots, and language translation systems further enhance communication by improving accessibility and reducing language barriers. As a result, information is shared more efficiently, and collaboration at both personal and professional levels has become easier than ever before.

The impact of technology and AI is especially evident in education and healthcare, where they have brought meaningful improvements. In education, digital classrooms, online courses, and intelligent learning systems have expanded learning opportunities beyond traditional classrooms. AI-based platforms can personalize learning by adapting content to the needs and pace of individual students, helping them understand concepts more effectively.

Teachers also benefit from technology through better assessment tools and improved student engagement. In healthcare, AI assists doctors in diagnosing diseases, analyzing medical data, and planning treatments with greater accuracy. Wearable health devices and mobile applications allow individuals to monitor their health regularly, encouraging preventive care and healthier lifestyles. These advancements have made essential services more accessible, efficient, and reliable.

Technology and artificial intelligence have also transformed workplaces and everyday routines by increasing efficiency and convenience. Automation and AI systems are widely used in industries such as manufacturing, finance, and transportation to perform repetitive and complex tasks with accuracy. While this has improved productivity, it has also raised concerns about job security and the need for continuous skill development. At the same time, AI-based applications such as recommendation systems, navigation tools, and smart home technologies simplify daily decision-making and save time. However, the growing dependence on technology brings challenges related to data privacy, ethical use, and human responsibility. To ensure a positive impact, it is important to use technology wisely and develop AI systems that respect human values. When used responsibly, technology and AI can continue to enhance human life and support sustainable development.

Aishwarya Sanjay
B.Tech ECE

Data Science 2.0: The Rise of AI - Driven Workflows

Over the past decade, data science has undergone a significant transformation. Traditionally, data scientists spent a large amount of time manually coding algorithms, selecting features, tuning models, and performing repetitive tasks. This human-intensive approach relied heavily on statistical modelling and hypothesis testing. Today, traditional data science is increasingly being replaced by AI-powered data science.

The integration of Artificial Intelligence (AI), Machine Learning (ML), and Deep Learning (DL) across the entire data science lifecycle—from data collection to deployment—has dramatically changed the landscape. Intelligent systems now assist or automate many stages of data processing, enabling faster and more accurate insights. Data quality and integration remain critical for AI success.

High-quality, well-integrated data ensures reliable predictions and effective analytics across systems. The synergy between data science and AI supports predictive analytics, automation, and innovation, helping organizations solve complex, real-world business problems. The impact of AI-driven data science extends to education as well. A key trend in this transformation is the rise of Automated Machine Learning (AutoML), Generative AI (GenAI), and AI assistants. AutoML automates tasks such as data preprocessing, feature engineering, model selection, and hyper parameter optimisation, making data science more accessible and efficient. Large Language Models (LLMs) further enhance this shift by enabling automated data analysis, summarisation, and knowledge extraction.

Another important aspect of AI-driven data science is the emergence of end-to-end automation and operationalization through MLOps. MLOps integrates machine learning models into production environments by automating model deployment, monitoring, versioning, and maintenance. This ensures that models remain accurate and reliable over time, even as data patterns change. By reducing manual intervention, MLOps allows organizations to scale AI solutions efficiently while responding quickly to real-world changes such as concept drift.

Furthermore, the democratisation of data science is a notable outcome of AI integration. Tools like AutoML and AI assistants enable non-experts to build and deploy models with minimal coding knowledge.

In conclusion, the transition from traditional to AI-driven data science marks a major evolution in the field. While foundational knowledge of statistics and machine learning remains essential, modern data scientists must also effectively leverage AI tools. This shift is making data science more scalable, efficient, and impactful across industries.

Srijan Kumari
B.Tech IT
6th Semester

Nanotechnology: A Revolutionary Tool in Microbial Diagnostics

Infectious diseases remain a major global concern as new diseases such as COVID-19, Ebola virus infections and Primary amoebic meningoencephalitis continue to emerge. Frequent climate changes have also contributed to the discovery of new bacterial strains. Infectious agents cause a wide range of diseases worldwide, including those spread through contaminated food and water, vectors, hospital-acquired infections and global pandemics. Conventional diagnostic techniques rely on bulky instruments, require longer time for results and are sensitive to environmental conditions. To overcome these limitations, researchers have developed innovative diagnostic approaches using nanotechnology. Nanomaterials possess unique physical and chemical properties that enable rapid, accurate and highly sensitive detection of infectious agents.

Gold nanoparticles with plasmonic shift ability and iron oxide nanoparticles with magnetic properties are widely used to detect pathogens, toxins, antigens and genetic material. Nanotechnology also plays a crucial role in identifying antibiotic-resistant bacteria by rapidly determining drug sensitivity using techniques such as amperometry and magnetic signal changes. These advanced diagnostic tools can help in early disease detection, prevention of epidemics and protection of economic health. Nanotechnology operates at the nanoscale, approximately one billionth of a meter, and has transformed modern medicine. It drives innovation in biomedical research, influences drug mechanisms and serves as an important tool for therapy. One of its major contributions is in targeted drug delivery and early diagnosis of diseases. In the future, nanotechnology aims to provide advanced research tools and clinically useful devices, with wide commercial applications in pharmaceuticals, including novel therapies, improved drug delivery systems and in vivo imaging.

In medicine, nanotechnology offers significant advantages, particularly in targeted drug delivery. Chemotherapy drugs can be delivered directly to cancer cells using nanoparticles, reducing toxicity and minimizing side effects such as hair loss and sensory disturbances. This targeted approach allows effective treatment while minimizing damage to healthy cells. Nanotechnology applications extend from cancer therapy to regenerative medicine, with the potential to repair or replace damaged tissues and organs. Nanoscale drug delivery systems require lower doses, act faster and are more sensitive than conventional methods, and some can be implanted for controlled and precise biochemical reactions. Recent developments highlight the effectiveness of nanotechnology in medical treatment. Abraxane, an FDA-approved nanoparticle drug, is a nanoparticle albumin-bound form of paclitaxel used to treat breast cancer and non-small cell lung cancer. It replaces toxic cremophore ethanol, reducing side effects and improving drug targeting at lower doses. Nanochains developed for doxorubicin delivery have shown improved tumor suppression in breast cancer studies, using only 5–10% of the standard dose with reduced harm to healthy cells. Polyethylene glycol (PEG) nanoparticles designed at the Massachusetts Institute of Technology enable targeted antibiotic delivery to infection sites, improving effectiveness and reducing side effects. Minicell nanoparticles derived from bacterial membranes are used to treat advanced and untreatable cancers by delivering drugs directly into tumor cells with fewer side effects.

In conclusion, nanotechnology holds immense potential in microbial diagnostics and healthcare. It enables rapid, sensitive and accurate detection of pathogens, supports targeted treatment strategies and reduces side effects. While its benefits are significant, further research is needed to understand its long-term environmental and health impacts before widespread adoption.

Nadeem Mallick
B.Tech IT

Future Careers in AI: What College Students must prepare for?

Introduction: Artificial Intelligence (AI) is no longer just a futuristic concept seen in science fiction movies—it has become a part of our daily lives. From voice assistants and recommendation systems to smart healthcare and automation, AI is transforming how we live and work. As industries rapidly adopt AI technologies, job roles are evolving. This makes it important for college students to understand AI careers and start preparing early.

Understanding Artificial Intelligence: AI refers to the ability of machines to think, learn, and make decisions like humans. It uses data, algorithms, and computing power to perform tasks that usually require human intelligence. Examples include chatbots, facial recognition, virtual assistants, and smart industrial machines. AI is continuously improving, making systems faster, smarter, and more efficient.

Why AI Careers Are Growing? The demand for AI professionals is increasing due to automation and data-driven decision-making. Organizations across healthcare, finance, education, agriculture, and manufacturing are adopting AI solutions. Rather than replacing jobs, AI is reshaping them. Students who understand AI tools and technologies will have better career opportunities in the digital job market.

Popular Career Options in AI: There are several exciting roles students can explore:

- **AI Engineers** – Build intelligent applications and systems
- **Data Scientists** – Analyze complex data to generate insights
- **Machine Learning Engineers** – Develop algorithms that help machines learn

These careers require programming knowledge, analytical thinking, and problem-solving skills.

AI in Different Fields: AI is not limited to IT. It is expanding into many sectors:

- **Healthcare:** Disease prediction, medical imaging
- **Agriculture:** Smart irrigation, crop monitoring
- **Environment:** Climate analysis, pollution control
- **Media & Design:** AI content creation, branding tools

This opens career paths for students from diverse academic backgrounds.

Role of Colleges: Colleges help students prepare through AI courses, updated curricula, internships, live projects, hackathons, and workshops. Industry exposure and practical learning make students job-ready and future-focused.

What Students Should Do? Students should take initiative by learning AI basics, building projects, joining tech communities, earning certifications, and staying updated with trends. Creating a strong portfolio is also essential.

Challenges in AI Careers: AI fields evolve quickly, requiring continuous learning. Skill gaps and ethical concerns like data privacy are also challenges. Overcoming these requires responsibility, adaptability, and lifelong learning.

Conclusion: Artificial Intelligence is shaping the future of work with endless possibilities. With the right preparation, skills, and mindset, college students can become future AI innovators and leaders.

Palak
B.Tech IT

The Generation That Is Never Offline

We live in a world where the first thing many people do after waking up is check their phone. Notifications, messages, reels, emails, and news updates surround us constantly. This is the reality of today's youth — **a generation that is never offline**. Technology has made life faster and easier, but it has also quietly changed the way we think, feel, and connect with others.

Social Media: Power and Pressure

Social media plays a major role in keeping this generation online. Platforms like Instagram, WhatsApp, and YouTube offer entertainment, information, and opportunities for self-expression. But they also create pressure — to look perfect, to be popular, and to keep up with trends. Many students compare their real lives with edited online lives, which can lead to stress, anxiety, and low self-confidence.

Impact on Mental Health

Being constantly online affects mental health. Continuous screen time reduces sleep quality, increases distraction, and makes it difficult to focus. Notifications never stop, and the fear of missing out (FOMO) keeps people glued to their screens. Slowly, silence feels uncomfortable and boredom feels unbearable. This generation is busy online, yet often feels lonely inside.

Loss of Patience and Deep Thinking

Being constantly online has reduced patience, as this generation expects instant replies and results. Waiting now feels frustrating, weakening focus, deep thinking, and critical reasoning. When everything comes quickly, the value of effort and persistence slowly fades.

Relationships Without Depth

The never-offline generation has many online connections but very few deep relationships. Conversations are reduced to emojis and short texts, weakening real communication skills. Despite being constantly connected, many feel lonely and emotionally unsupported.

The Need for Digital Balance

Being never offline is not entirely bad — technology is a powerful tool. The real need is balance. Taking breaks from screens, spending time offline, talking face-to-face, and enjoying real experiences are essential for a healthy life. Digital discipline is becoming as important as digital skills.

Conclusion

Being online is powerful, but being present is priceless. This generation must remember that life is not lived on a screen, but in moments that require us to look up, listen, and truly feel.

Vaishnavi Gupta
B.Tech IT

The Soft War: Algorithms, Regimes, and India's Search for Sovereignty

The Ghost of Kargil

In 1999, at the frozen peaks of Kargil, Indian soldiers faced a silent but deadly enemy: a blank screen. When New Delhi requested precise GPS data from the USA to locate infiltrating Pakistani troops, Washington refused. That betrayal birthed NavIC, our home-grown satellite system. But as we move into 2026, history might repeat. Only this time, the stakes aren't just coordinates on a mountain; they are the coordinates of our democracy, our economy, and our collective mindset.

The Rented Roof: Our AI Dependency

Today, India is living in a glamorous but fragile AI Bubble. We use Instagram to communicate, Google to learn, and ChatGPT to create. But underneath the smooth interfaceslies a terrifying truth: we do not own the root. As a B.Tech student myself, I look at our tech ecosystem and see a dangerous dependency tree. Most of our indigenous AI startups are built on top of foreign owned Large Language Models (LLMs). If a foreign government decides to flip the switch, citing sanctions or policy shifts, India's digital economy would go blank.

The Invisible Frontline

The threat isn't just about service denial, we have witnessed the unrest in our neighbourhood from Bangladesh to Nepal where digital platforms played a huge role in regime change. When a foreign corporation decides what goes viral and what gets suppressed, they aren't just managing a platform; they are weaponizing it for "Soft War"-no missiles, no tanks, just the slow manipulation of a billion feeds. We are currently living on USA's terms, and history proves that those terms can change the moment their geopolitical interests shift.

The Engineering Mandate: A Call to Action

So, how do we act? It's not enough to build another social media app or a copycat AI. We must go deeper. True sovereignty requires three pillars:

1. Sovereign AI: We need models trained on Indian data and languages to ensure that our narrative isn't filtered through a foreign lens.
2. Hardware Autonomy: Without our own chips, we are just code running on someone else silicon. The India Semiconductor Mission is as vital today as the nuclear program was in the 1970s.
3. Data Sovereignty: Our data must be processed on Indian servers, ensuring it cannot be weaponized against us as a tool for digital colonization.

To my fellow engineers, we cannot afford to be just "coders for hire." We are the architects of India's digital borders. It's time to stop living in the bubble. It's time to build the shield.

Rupali Upadhyay
B.Tech CSE G

ISRO and Other Research Organizations: Exploring Beyond Limits

Human curiosity has always driven us to explore the unknown, and space research is one of the strongest expressions of that curiosity. Space research organizations play a vital role in expanding scientific knowledge while also improving life on Earth.

Among these, India's Indian Space Research Organisation (ISRO) stands out as a symbol of dedication, innovation, and national pride.

Since its establishment in 1969, ISRO has focused on using space technology for societal development. Its satellites support communication, weather forecasting, navigation, agriculture, and disaster management.

Missions such as Chandrayaan and the Mars Orbiter Mission have earned global recognition, showing how determination and efficient planning can lead to extraordinary achievements.

ISRO's journey is part of a larger global effort. Organizations like National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) have contributed immensely to space exploration through advanced research, space telescopes, and deep-space missions. Their work has helped humanity understand the universe while promoting international cooperation.

Beyond space agencies, research institutions and universities also play an important role by training scientists, developing new technologies, and encouraging innovation.

Together, these organizations inspire students to pursue science and engineering and remind us that progress comes from curiosity, teamwork, and perseverance.

Ultimately, space research is not just about reaching distant planets—it is about using knowledge to improve life on Earth and imagining a better future.

Organizations like ISRO and their global counterparts continue to bring the universe a little closer to us all.

Krishna Dwivedi
B.Tech CSE E

CGC Landran: More Than a Campus, It's a Launchpad

Chandigarh Group of Colleges (CGC) Landran stands today not merely as an educational institution, but as a dynamic launchpad that propels students into the real world with confidence, clarity, and purpose. With an ecosystem that blends academic excellence, innovation, entrepreneurship, research, cultural diversity, and professional grooming, CGC Landran continues to redefine what a modern campus should be.

From the moment a student steps onto the campus, they are welcomed into a world driven by aspiration and growth. The infrastructure is not just visually impressive, but strategically designed to support skill development. Well-equipped laboratories, innovation centers, incubation facilities, libraries, and collaborative spaces ensure that learning goes far beyond textbooks and classrooms.

One of the strongest pillars of CGC Landran is its emphasis on practical exposure. Industry-oriented programs, expert lectures, technical workshops, internships, and corporate interaction sessions create a bridge between academic knowledge and industry expectations. Students learn how to apply concepts in real-world scenarios, solve problems creatively, and communicate effectively—skills that set them apart in competitive environments.

The achievements of the college in placements highlight the success of this approach. Global companies and emerging startups alike recognize CGC Landran as a hub of talented and job-ready professionals. High placement packages, diverse job roles, and recurring corporate partnerships testify that the campus is a trusted source of skilled human capital.

Beyond academics and placements, CGC Landran also serves as a nurturing ground for innovation and entrepreneurship. Through incubation centers, idea competitions, startup mentoring, and funding support, students are encouraged to think boldly and chase their ambitions. The campus has witnessed multiple startup success stories, reaffirming that innovation thrives where the ecosystem supports it.

Equally vibrant is the cultural and sports environment. Annual fests, technical events, hackathons, inter-college competitions, cultural nights, and sports tournaments help students discover their passions and talents. These experiences shape personalities, build leadership qualities, and foster teamwork—traits that are invaluable in professional and personal life.

What makes CGC Landran truly stand out is its holistic development model. Students are empowered academically, professionally, socially, and emotionally. They graduate not only with degrees, but with confidence, resilience, networking capabilities, and a mindset ready to take on real-world challenges.

In essence, CGC Landran is not just a place where careers begin—it's where dreams take shape, ideas gain direction, and futures are built. It is a space that inspires students to aim higher, think smarter, and achieve more. That is why CGC Landran is far more than a campus; it is a launchpad for life.

Akshit
B.Tech CSE(A2)

What School Taught Us vs. What Life Demands

We spent nearly fifteen years learning how to raise our hands before we spoke. Life, however, expects us to speak up even when our hands are shaking. That, right there, is the difference between school and life. School taught us that there is one right answer.

Life teaches us that the "right" answer changes with people, situations, and timing.

School was our first universe—neatly timed periods, fixed syllabus, and answers hidden safely at the back of textbooks. Life, on the other hand, has no timetable, no prescribed chapters, and definitely no answer key. The transition between the two feels less like graduation and more like being pushed into deep water with a smile and a "You'll figure it out."

School was our training ground. Life is the real battlefield. One gave us rules to follow; the other asks us to write our own.

School Taught Us to Find Answers, Life Demands We Create Them:
In school, every question had a fixed answer. If you followed the formula correctly, you were right. Life, however, rarely gives us options—only situations. It expects originality, decision-making, and courage, even when there is no "correct" solution.

Life values thinkers, not just toppers.

School Rewarded Obedience, Life Demands Initiative:
We were praised for being quiet, disciplined, and well-behaved. Raising questions often felt risky. Life, on the other hand, rewards those who speak up, take risks, and step forward without being asked. Waiting for instructions works in classrooms—not in careers.

School Feared Failure. Life Depends on It:
Mistakes in school meant lost marks and lowered ranks. Failure was something to hide. In life, failure becomes feedback. Every setback carries a lesson, and every mistake sharpens wisdom. In school, failure ended chapters. In life, it begins them.

School Taught Subjects, Life Demands Skills:
Algebra, history, and science shaped our knowledge, but life demands skills no syllabus mentioned—emotional intelligence, adaptability, financial awareness, patience, and resilience.

Degrees may open doors, but skills keep them open.

The Final Lesson:
School gives us the foundation. Life tests how we use it. Education doesn't end with a farewell assembly—it begins when we step into uncertainty with courage.

Perhaps school prepared us to pass exams, life prepares us to find meaning. And the real success? Learning to grow, adapt, and stay human—long after the textbooks are closed.

We were rewarded for silence, obedience, and conformity. We memorized formulas, dates, and definitions, believing intelligence was about how much we could retain. Exams tested our memory, not our mindset. Failure came with red marks, rankings, and shame—something to be avoided at all costs.

School taught us to follow instructions.

Life demands that we create our own. We learned how to pass tests, not how to handle rejection. We learned punctuality, not patience. We learned competition, but not collaboration. Nobody taught us how to manage emotions, deal with loneliness, negotiate salaries, or recover from dreams that didn't go as planned.

Life demands adaptability in a world that refuses to stay still. It expects us to make decisions without complete information and stay calm when everything feels uncertain. It values skills that were never graded—communication, empathy, resilience, and courage.

The Real Lesson:
Perhaps school wasn't wrong—it was just incomplete. It gave us the foundation, but life builds the structure. The real education begins when we step outside the classroom and realize that learning never stops. Every heartbreak, every risk, every small win adds a new chapter to our syllabus. In the end, school prepares us to survive exam, life prepares us to discover ourselves.

Ananya Prabhakar
B.Tech CS

FRIENDS

Life without them ends,
They are so-called friends.
They are like the mountains,
That stop the floods.
They are like love's fountain,
And they run in my blood.
But some are as clever as snakes,
For all the fake things they make.
They show us that they are very kind,
And we start believing them, like a blind.
It is as tough as climbing a mountain covered with clouds,
To find a real, kind-hearted friend
Of whom you will be proud.
They help you in every need,
They are one of the reasons, you succeed.
Life without them ends,
They are so-called friends.

Harkirat Kaur
B.Tech AIDS
4th Semester

Fallen From Grace

I can't cry for you.
My prayers are not sincere.
I choose to believe you're a mere myth,
Yet I know you're out there.

For I know someone like me can't attain you
And that verdict just stings too much.
So I just brush that thought away
As my innocence slips from my clutch.

To the numbed, devotion is but a fallacy.
I envy the ones who aren't like me.
I didn't choose to be this way,
But you didn't heed my plea.

Barefoot at your threshold,
For an eternity, I stand.
Staring at the flower in my hand.

Was it always shrivelled?
I just plucked it, did I not?
Or have I been standing here
Long enough for it to rot?

The sun hides behind the horizon
As I embrace my woes.
Your shrine eclipses my face,
For your grace doesn't fall on a withered rose.

Aryan Jamwal
B.Tech AI-DS
6th Semester

Gen Z at the Crossroads: Innovation, Anxiety and the Future of India

India today stands at a defining moment in history, and at the heart of this transformation is Generation Z — a generation born into smartphones, social media, and sweeping global change. As the youngest workforce entrants and future leaders of the nation, Gen Z finds itself at a crossroads where innovation and anxiety walk hand in hand.

Gen Z is the most technologically fluent generation India has ever seen. From coding in college classrooms to launching startups from hostel rooms, young Indians are redefining innovation. They are creators, not just consumers. Platforms like artificial intelligence, digital marketing, fintech, and app development have become tools of empowerment. This generation is not waiting for opportunities; it is building them. Initiatives like Digital India and the startup ecosystem have further fueled their ambition, making innovation a daily reality rather than a distant dream.

However, this rapid progress comes with its own set of challenges. Alongside ambition lies anxiety. Academic pressure, career uncertainty, competitive job markets, and the constant comparison culture of social media have deeply affected mental well-being. Gen Z often carries the weight of high expectations — from family, society, and themselves. The fear of failure and the pressure to succeed early can sometimes overshadow creativity and confidence.

Yet, what sets Gen Z apart is its awareness. Unlike previous generations, today's youth openly discusses mental health, work-life balance, and emotional well-being. They are challenging outdated norms and demanding healthier environments — in classrooms, workplaces, and society. This courage to speak up is itself a powerful innovation.

The future of India is closely tied to how this generation is guided and supported. With the right mentorship, inclusive education, and mental health support, Gen Z can transform anxiety into resilience and ideas into impact. Institutions like CGC Landran play a crucial role in shaping this journey by nurturing skills, values, and confidence.

In conclusion, Gen Z stands at a crossroads — one path marked by innovation, the other shadowed by anxiety. If balanced wisely, these paths can merge into a powerful force that drives India toward a progressive, inclusive, and globally influential future. The choices made today will define not only this generation, but the destiny of the nation itself.

Vansh
B.Tech CSE (I1)

Explainable Artificial Intelligence: Building Trust in Intelligent Systems

Artificial Intelligence has evolved from an experimental concept into a powerful force shaping modern society. Intelligent systems now assist in healthcare, finance, education, and digital platforms, influencing decisions that directly impact human lives. From years of working closely with such systems, one reality becomes clear: accuracy alone is not enough. Trust is equally essential.

Many advanced AI models function as complex systems capable of producing highly accurate results. However, their internal decision-making processes often remain unclear, even to experts. This lack of transparency has created what is known as the "black box" problem, where outcomes are visible but reasoning is hidden. In critical fields, this absence of clarity can lead to hesitation, skepticism, and resistance.

Explainable Artificial Intelligence addresses this challenge by focusing on transparency and interpretability. Instead of delivering results without context, explainable systems offer meaningful insights into how decisions are made. By revealing the reasoning behind outcomes, these systems allow users to evaluate, question, and confidently rely on Artificial Intelligence. Trust plays a crucial role in the adoption of intelligent technologies. In healthcare, professionals must understand why a system suggests a particular diagnosis. In finance, decision-makers must know which factors influence approvals or risk assessments. Explainable Artificial Intelligence enables this understanding, transforming AI from an opaque tool into a reliable partner.

Another significant advantage of Explainable AI is accountability. Transparent systems make it easier to identify errors, biases, or unintended behavior. When reasoning is accessible, organizations can ensure that intelligent systems operate ethically and responsibly. This accountability is vital as AI-driven decisions increasingly shape social and economic outcomes.

Explainable Artificial Intelligence also strengthens collaboration between humans and machines. Rather than replacing human judgment, explainable systems support informed decision-making. When users understand system behavior, they are more likely to trust its recommendations and apply them effectively in real-world situations.

From a development perspective, explainability improves system design and reliability. Clear insights into model behavior help developers refine algorithms, enhance performance, and ensure consistent results across different environments. Over time, this leads to more dependable and robust intelligent systems. Despite its benefits, achieving explainability presents challenges. Highly accurate models are often complex, and simplifying their logic without losing essential information requires careful balance. However, ongoing research continues to bridge this gap, making explainable systems increasingly practical.

In conclusion, Explainable Artificial Intelligence is not merely a technical enhancement; it is a foundation for responsible innovation. As Artificial Intelligence becomes deeply embedded in society, transparency and trust will define its success. By making intelligent systems understandable, Explainable AI ensures that technological progress remains aligned with human values.

Harsh Kumar
B.Tech IT- A2

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