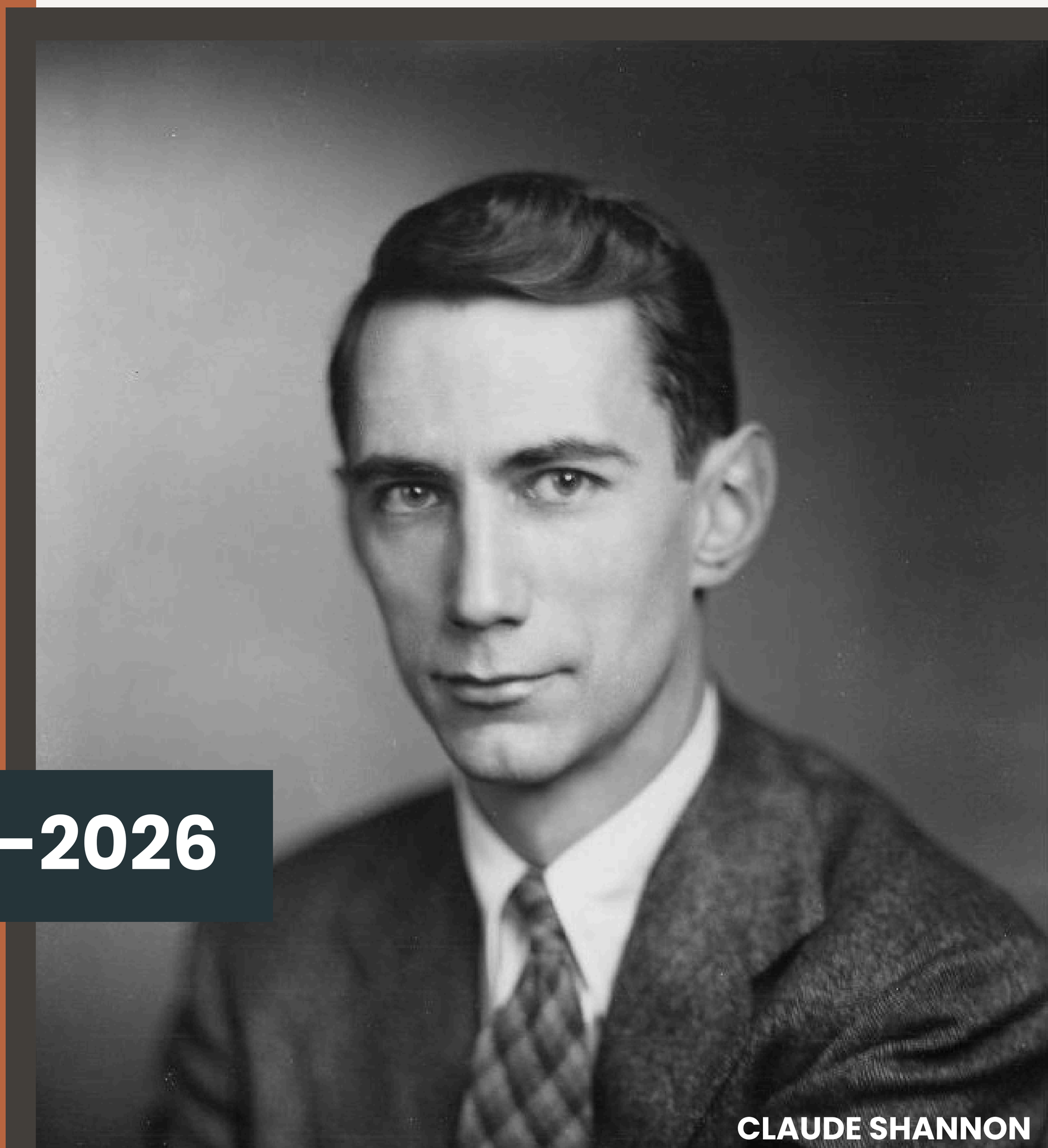
NERIST

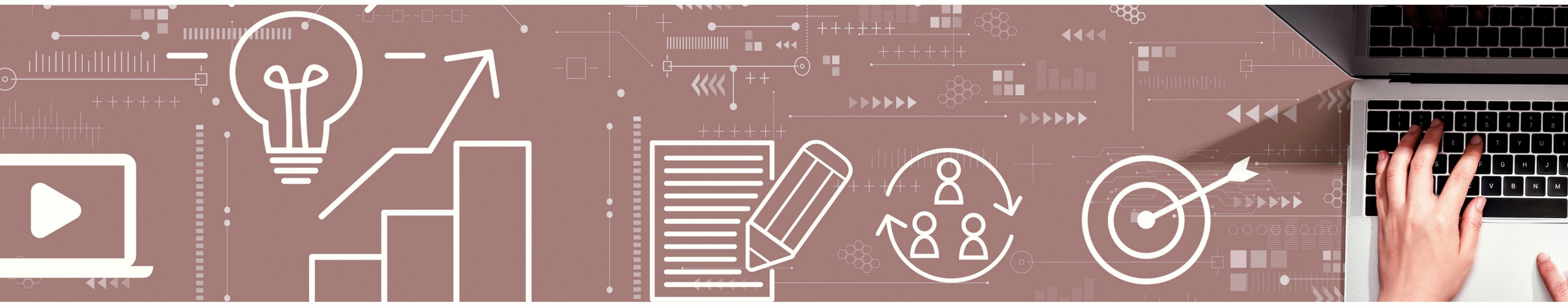
SIGNAL

Filtering the Noise,
Amplifying the Future



CLAUDE SHANNON

2025–2026



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Message from the Head of Department

Dr. Joyatri Bora Hazarika

It is with immense pride and joy that I extend my warm greetings to all members of the NERIST Electronics Society (NES) on the release of this new edition of our departmental magazine. This publication is a reflection of the vibrant academic and creative spirit that thrives within the Department of Electronics and Communication Engineering at NERIST.

A magazine like this is not just a compilation of articles, projects, and artwork- it is a celebration of thought, innovation, and collaboration. It provides a much-needed platform for students to voice their ideas, share their knowledge, and express themselves beyond the classroom. In today's fast-paced world of technological advancement, such platforms play a crucial role in encouraging students to think critically, communicate effectively, and remain curious and engaged.

Over the years, our department has strived to nurture minds that are not only technically sound but also ethically responsible and socially aware. I am delighted to see our students actively participating in such meaningful extracurricular initiatives, which complement their academic growth and help build a well-rounded personality. The enthusiasm, teamwork, and dedication demonstrated by the NES team in putting this magazine together are truly commendable.

This magazine is also a testimony to the power of student-led initiatives, where passion meets purpose. It is heartening to see students exploring diverse topics- from cutting-edge technologies and research innovations to personal reflections and creative expression. Such contributions enrich the learning ecosystem and create a lasting impact on the readers.

I extend my sincere congratulations to the NES editorial team and all the contributors for their outstanding efforts. I hope this magazine will continue to inspire future batches to take forward this legacy of creativity, leadership, and excellence.

Wishing you all continued success, both in your academic endeavors and in your journey toward becoming responsible and innovative professionals.

Dr. Joyatri Bora Hazarika
Head of the Department
Electronics and Communication Engineering
NERIST

Message from the NES Coordinator

Mr. Rusni Kima Mangang

I am truly proud of your remarkable work in publishing this magazine. It's inspiring to see your creativity, passion, and teamwork come together so beautifully. Every article, illustration, and idea reflects your talent and commitment.

This magazine is more than just a project-it's a powerful expression of your voices and perspectives. You've shown initiative, leadership, and the courage to share your thoughts with others.

Keep believing in your potential and continue creating with purpose. I'm excited to see where your talents will take you next.

Warm regards,
Mr. Rusni Kima Mangang
NES COORDINATOR

Message from the General Secretary

Ayush Sarmah

Greetings to the NES Family,

It is my privilege to present this edition of **"Signal"**, the annual magazine of the NERIST Electronics Society. This publication reflects the talent, creativity, and achievements of our students and faculty, while showcasing the vibrant spirit of the Department of Electronics and Communication Engineering.

I extend my heartfelt gratitude to all contributors, the editorial team, and our faculty members whose dedication and support made this edition possible. Their collective efforts have helped create a magazine that informs, inspires, and celebrates our community.

I hope Signal encourages learning, creativity, and meaningful connections among its readers. Wishing you an enjoyable and enriching reading experience.

Warm Regards,
Ayush Sarmah
General Secretary
NERIST Electronics Society

Message from the Assistant General Secretary

Asmita Barman

Greetings to the NES Family,

It gives me immense pleasure to welcome you to this edition of our annual magazine of the NERIST Electronics Society. This publication serves as a reflection of the creativity, innovation, and accomplishments of our Electronics and Communication Engineering community.

I would like to express my heartfelt appreciation to all the contributors, the editorial team, and our esteemed faculty members for their continuous dedication and support in bringing this magazine to life. Their collective efforts have created a platform that encourages knowledge sharing, celebrates talent, and provides a space for creative expression.

I hope this edition motivates you, inspires fresh ideas, and highlights the enthusiasm and excellence of our department.

Warm Regards,
Asmita Barman
Assistant General Secretary (AGS)
NERIST Electronics Society

BITOPAN HAZARIKA
B.Tech 3rd Year

ECE: On-Campus vs Off-Campus — Beyond the Placement Debate

Every placement season at NERIST brings with it a familiar conversation among students of the Department of Electronics and Communication Engineering. Some focus entirely on campus placements, while others spend significant time pursuing off-campus opportunities. A few prepare for GATE, while others dream to transition into management through an MBA from a premier institution. Amidst all these choices, one question continues to surface:

What is the best path for an ECE student?

The answer, however, goes beyond simply choosing between on-campus and off-campus opportunities. It lies in understanding how the industry perceives us, how we prepare ourselves, and how our collective performance shapes the opportunities available to us.

At NERIST, the placement ecosystem has expanded considerably over the years. The number of recruiters and placement offers has increased significantly, creating more opportunities for students than ever before. Many reputed organizations, including TCS, Infosys, Accenture, Cognizant, Capgemini, HCLTech, Deloitte, Wipro, Tech Mahindra, and IBM, recruit from our campus, reflecting the institute's increasing exposure and the efforts of the Placement Cell.

Yet beneath this success lies a reality that many ECE students quietly acknowledge.

Most of the major recruiters visiting our campus belong to the IT and consulting sectors. Their compensation packages are often more attractive than those offered by the limited number of core electronics companies that visit. Consequently, many students who entered ECE with aspirations of working in semiconductor design, embedded systems, VLSI, communication engineering, or electronics hardware eventually move toward software and IT roles.

Why do core opportunities remain limited despite the presence of a strong ECE program?

A common response is that core companies simply do not visit enough. While there is some truth to this, the complete picture indeed more complex. When companies invest time and resources to recruit from a campus, they expect students to demonstrate strong technical proficiency. Unfortunately, one pattern repeatedly observed during placement periods is that many students successfully clear the aptitude or online assessment rounds but struggle during technical interviews.

The reasons vary. Some students lack confidence in fundamental concepts, while others rely heavily on short-term preparation. In many cases, students list projects on their resumes but cannot explain the underlying concepts in depth. As a result, candidates who appear promising in the initial stages often fail to convert opportunities into offers. This is perhaps one of the most overlooked challenges facing ECE students today.

The issue is not merely that core companies visit less frequently; it is also that when opportunities arise, we do not always invest on them. If future batches consistently demonstrate stronger technical speciality, build meaningful projects, and perform well in interviews, the institute's reputation among core recruiters will naturally improve. Better student outcomes often attract better recruitment opportunities.

The off-campus route presents an entirely different landscape. It offers access to a much wider sea of opportunities, including startups, product-based companies, semiconductor firms, research organizations, and emerging technology sectors. However, it also demands significantly greater initiative.

There are no structured timelines, no guaranteed interview calls, and no placement drives organized on one's behalf. Students must independently build their profiles, apply consistently, network professionally, and withstand repeated rejections.

The off-campus journey however favors those who have invested time in internships, research work, competitive programming, embedded systems projects, or specialized technical skills. For students determined to pursue particular ECE domains, it can be an invaluable pathway.

Every year, several NERIST students choose a different direction altogether. Some prepare for GATE and secure admission into prestigious IITs and NITs for M.Tech programs. A few of them pursue management education through CAT and some also appear exams like IELTS or TOEFL as a part of their plan to secure admission to universities abroad. Still others move toward research, higher studies, public sector opportunities, or entrepreneurship.

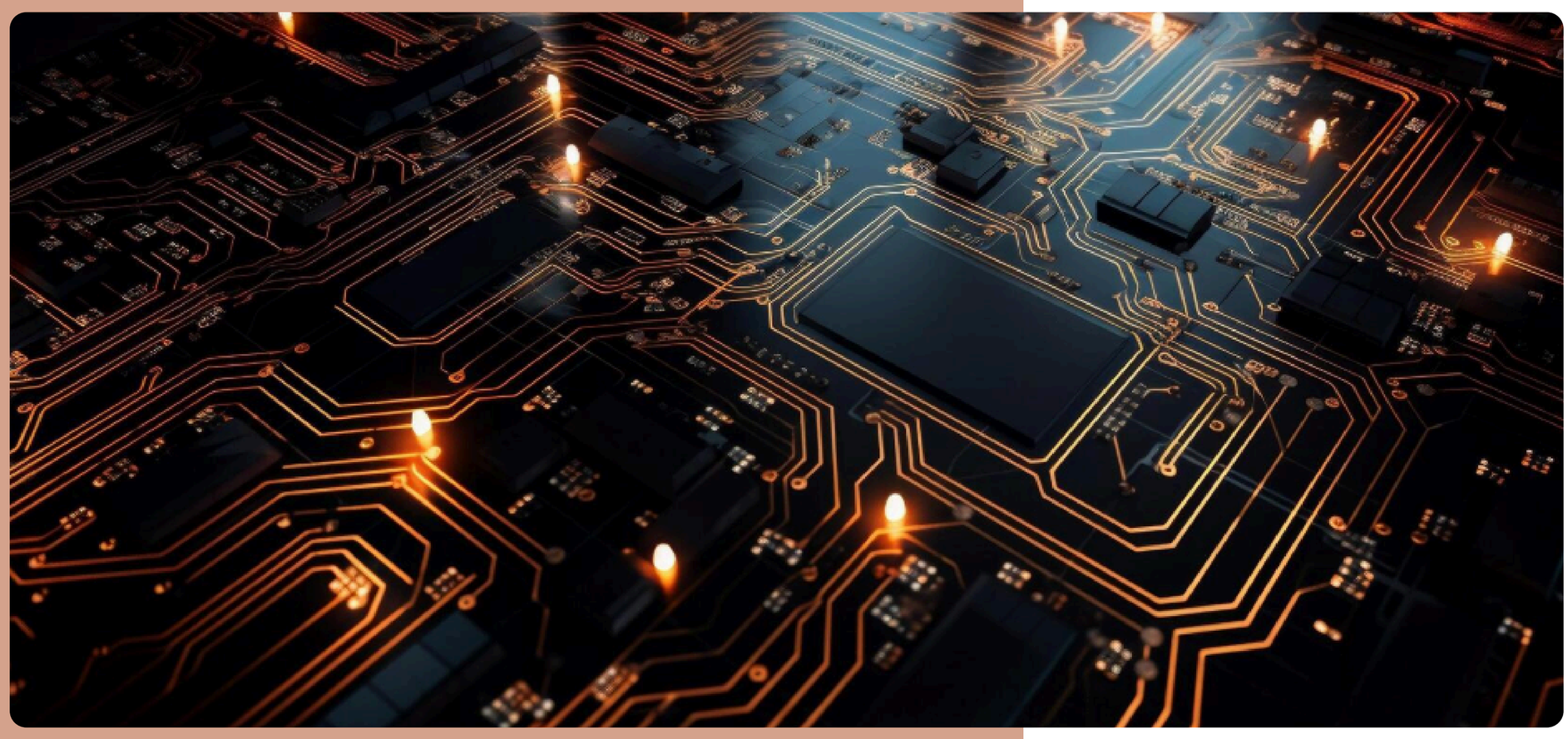
Interestingly, many of the most remarkable career trajectories do not begin with the highest placement package. An M.Tech graduate specializing in VLSI may eventually work on advanced semiconductor technologies. A researcher may contribute to innovations that shape future communication systems. An MBA graduate may transition into leadership and strategy roles. These paths often require greater patience, but they can open doors to opportunities that extend far beyond the scope of campus recruitment. This broader perspective is especially important in an era where people are increasingly tempted to judge success solely through placement statistics and salary figures.

Perhaps the most important lesson for ECE students at NERIST is that no single path guarantees success. Campus placements, off-campus opportunities, higher studies, research, entrepreneurship, and competitive examinations are not competing alternatives; they are different routes toward the same objective: building a meaningful and fulfilling career.

The students who ultimately succeed are rarely those who simply choose the right path. More often, they are the ones who prepare consistently, strengthen their fundamentals, and continue learning long after examinations and interviews are over.

Because opportunities may come and go, but preparation has a way of creating new ones.

SOMDATT VISHWAKARMA
B.Tech 2nd Year



From Circuits to Intelligence: The Journey of Modern Technology

In the silent language of circuits and signals, a revolution is taking place—one that is transforming the way we live, think, and interact with the world. Technology today is not just about machines; it is about intelligence, connectivity, and innovation. The journey began with simple electrical circuits, where engineers designed systems to solve basic problems. Over time, these circuits evolved into complex integrated systems, giving birth to computers, smartphones, and smart devices. Today, technologies like Artificial Intelligence (AI), the Internet of Things (IoT), and 5G communication are redefining the boundaries of what is possible. For students of Electronics and Communication Engineering, this transformation holds special significance.

Every signal transmitted, every microcontroller programmed, and every network designed contributes to a larger ecosystem of smart technology. From smart homes to autonomous vehicles, ECE plays a vital role in building the backbone of modern innovations. One of the most exciting aspects of modern technology is connectivity. With billions of devices connected worldwide, data has become the new fuel of the digital age. Real-time communication, cloud computing, and edge devices are enabling faster and smarter decision-making. This interconnected world is not only improving efficiency but also opening doors to endless opportunities.

However, as technology grows more powerful, challenges also arise. Issues such as cybersecurity, data privacy, and ethical concerns demand attention. Engineers and developers must ensure that technology is used responsibly and for the benefit of society.

Looking ahead, the future of technology is both exciting and unpredictable. Innovations like quantum computing, advanced robotics, and intelligent systems will continue to push the limits of human imagination.

The role of students is not just to learn existing technologies but to create new ones that can solve real-world problems. In conclusion, the journey from circuits to intelligence is a testament to human creativity and determination. As future engineers, we are not just users of technology—we are its creators. The responsibility lies in our hands to shape a future that is not only advanced but also meaningful and inclusive.

KHRISTINA LAIRENJAM
B.Tech 1st Year

Artemis II: The Next Step Toward the Moon

Artemis II is ten-day lunar flyby mission that launched on April 1,2026. It is the first crewed flight of the NASA-led Artemis program and the first crewed flight beyond low Earth orbit since Apollo 17 in 1972.

Artemis II builds on the success of the uncrewed Artemis I in 2022, and will demonstrate a broad range of capabilities needed on deep space missions. The Artemis II test flight will be NASA's first mission with crew aboard the SLS (Space Launch System) rocket and Orion spacecraft. The mission is a test flight supporting subsequent Artemis missions aimed at returning humans to the lunar surface. Artemis II's mission objectives are similar to those of Apollo 8 in 1968, the first crewed lunar flight during the Apollo program. The Orion spacecraft will serve as the exploration vehicle that will carry and sustain the crew on Artemis missions to the moon and return them safely to earth.

During the mission, Victor Glover (an African-American) became the first person of colour, Christina Koch the first woman, Canadian Space Agency astronaut JeremyHansen the first non-U.S. citizen, and commander Reid Wiseman the oldest person to travel beyond low Earth orbit and near the Moon. During their lunar flyby, the crew set the record for human distance from Earth, 406,771 km, breaking Apollo 13's record of 400,171 km. The landing site has been planned at the Pacific Ocean on the landing date April 11, 2026.

Artemis II is not the destination, but the beginning which paves the way for Artemis III.

ARYAN RAJ
B.Tech 2nd Year

The Importance of Technology in Modern Education

Technology has transformed the way education is delivered and received in today's world. From smart classrooms to online learning platforms, students now have access to vast amounts of information at their fingertips. This has made learning more interactive, flexible, and efficient. One of the major advantages of technology in education is accessibility. Students from remote areas can now access quality education through online courses and digital resources. Moreover, technology encourages self-paced learning, allowing students to understand concepts more effectively.

Another important aspect is the use of multimedia tools such as videos, simulations, and virtual labs. These tools make complex topics easier to understand and more engaging for students. Teachers also benefit from technology as it helps them manage classes, track performance, and deliver content efficiently.

However, it is important to use technology wisely. Excessive dependence can reduce critical thinking and face-to-face interaction. Therefore, a balanced approach is necessary to maximize the benefits of technology in education. In conclusion, technology plays a vital role in shaping the future of education. When used effectively, it can enhance learning experiences and open new opportunities for students worldwide.

SAKSHI SHARMA
B.Tech 2nd Year

Student Life in College: A Survival Story

If someone ever asks me to define college life in one sentence, I'd say: **"It's a beautiful mess where you're broke, sleepy, confused... but somehow still having the best time of your life."**

The first day of college starts with full excitement. New clothes, new bag, and a promise to yourself: **"This time I will study regularly."** Fast forward to a few weeks later, and that promise quietly disappears somewhere between canteen visits and "just one more episode" nights.

Talking about mornings—college students and morning classes have a very complicated relationship. Waking up early feels like a personal attack. Alarms ring, snooze buttons suffer, and somehow you convince yourself that attendance is just a "suggestion." But on the rare days you actually attend class, you sit there trying to understand the lecture while your mind is busy planning what to eat next. And then comes the Food Stalls—the real heart of college. No matter how serious your problems are, a plate of samosa or maggi somehow makes everything feel manageable. Important decisions are made here, like **"Should we attend the next class?"** (Answer is usually no.)

Friends in college are a different kind of blessing. These are the people who become your unpaid therapists, assignment partners, and partners-in-crime. Group studies? Honestly, they start with studies and end with gossip, laughter, and random life discussions. But somehow, you still manage to pass exams (miracle or teamwork, who knows?).

Ah yes, exams—the time when the entire syllabus suddenly becomes important one night before. Notes are borrowed, PDFs are downloaded, and prayers are offered to every possible higher power. That one **"topper friend"** becomes the most important person in your life. And when the exam ends, you walk out saying, **"Next semester I'll start early."** (You won't. We all know that.)

College life is also about discovering yourself. One day you think you'll become an engineer, the next day a content creator, and sometimes just a person who wants to sleep peacefully for 8 hours. You try new things—events, clubs, maybe even dancing on stage when you swore you never would. And somewhere in all this confusion, you grow.

Of course, it's not always fun. There are days when assignments pile up, homesickness hits hard, and you question all your life choices at 2 AM. But then your friends drag you out for chai, and suddenly life feels okay again.

In the end, college life isn't perfect—but that's what makes it special. It's full of chaos, laughter, last-minute panic, and unforgettable memories. Years later, you won't remember every lecture, but you'll definitely remember the people, the fun, and the little moments that made everything worth it.

So here we are—tired, broke, confused... but secretly wishing this phase never ends.

RAKESH KUMAR GUPTA
B.Tech 1st Year

From 5G to 6G: What Will Actually Change?

Just when the world is getting used to 5G speeds, engineers are already working on the next big thing - 6G. If you think this is just another "faster internet" upgrade, you're underestimating what's coming.

So, What's New?

- **Blazing Fast Speeds:** *Imagine downloading an entire movie in seconds—6G aims to make that normal.*
- **Near-Zero Delay:** *Actions happening almost instantly, which is critical for things like self-driving cars and remote surgery.*
- **New Frequency Levels:** *6G will use terahertz waves—sounds cool, but also makes engineering much harder.*
- **Smarter Networks:** *With built-in AI, networks won't just transmit data—they'll think and adapt.*
- **Connectivity Everywhere:** *Even remote villages could get high-speed internet through satellite integration.*

Where Will This Be Used?

- Holograms like video calls (like sci-fi movies)
- Advanced VR and AR experiences
- Fully autonomous vehicles
- Smart cities running in real time

But Here's the Reality Check

6G isn't magic. It comes with serious challenges:

- Signals at high frequencies don't travel far
- Infrastructure will be expensive
- Power consumption will increase

Final Thought

5G made the world faster.
6G aims to make it smarter.

If it works as planned, the future won't just be connected - it will be **intelligently connected.**

SHIVAM PRATAP
B.Tech 2nd Year

NERIST Echoes

Beneath the emerald peaks where the mist rolls low,
The valleys of Nirjuli catch the monsoon's glow.
As heavy rains drum on the corridor tiles,
We navigate circuits and technical trials.

From Mid-Sem pressure to the End-Sem race,
The pulse of the mountains sets our study pace.
But stress fades away when the campus turns bright,
With festivals sparking a collective light.

From SYNERGY's fire to the RACAF stage,
With SRISTI's brilliance on every page,
In the heart of ECE, through rain and cold,
The story of NERIST is bravely told.

MANDIP KHATRI DAHAL
Base 2nd Year

The Future of Electronics: Powering the Digital Age

Introduction

Electronics is the foundation of modern technology. It shapes how we communicate, work, and live. From smartphones and laptops to satellites and smart homes, electronic innovations have changed society. As a second-year student in engineering, understanding the importance of electronics creates a solid base for future academic and professional growth.

What is Electronics?

Electronics is a branch of science and engineering focused on the flow of electrons in devices and systems. It involves designing, developing, and operating components like resistors, capacitors, diodes, and transistors. These elements are the building blocks of complex electronic circuits found in everyday technology.

Evolution of Electronics

The journey of electronics has been impressive:

- Vacuum Tubes (Early 20th Century): Used in early radios and computers.
- Transistors (1947): Replaced bulky vacuum tubes, making devices smaller and more efficient.

- Integrated Circuits (ICs): Enabled the development of compact and powerful electronic systems.
- Microprocessors: Led to the creation of modern computers and smartphones.
- Nanotechnology and VLSI: Continue to push the limits of speed, efficiency, and miniaturization.

Each stage has significantly impacted technological progress and innovation.

Applications of Electronics

Electronics plays a key role in many fields:

- Communication Systems
- Healthcare
- Consumer Electronics
- Transportation
- Industrial Automation
- Space and Defense

Emerging Trends in Electronics

The future of electronics is driven by innovation and technological progress:

- Internet of Things (IoT:
- Artificial Intelligence (AI)
- 5G and Beyond
- Renewable Energy Electronics
- Flexible and Wearable Electronics
- Quantum Electronics

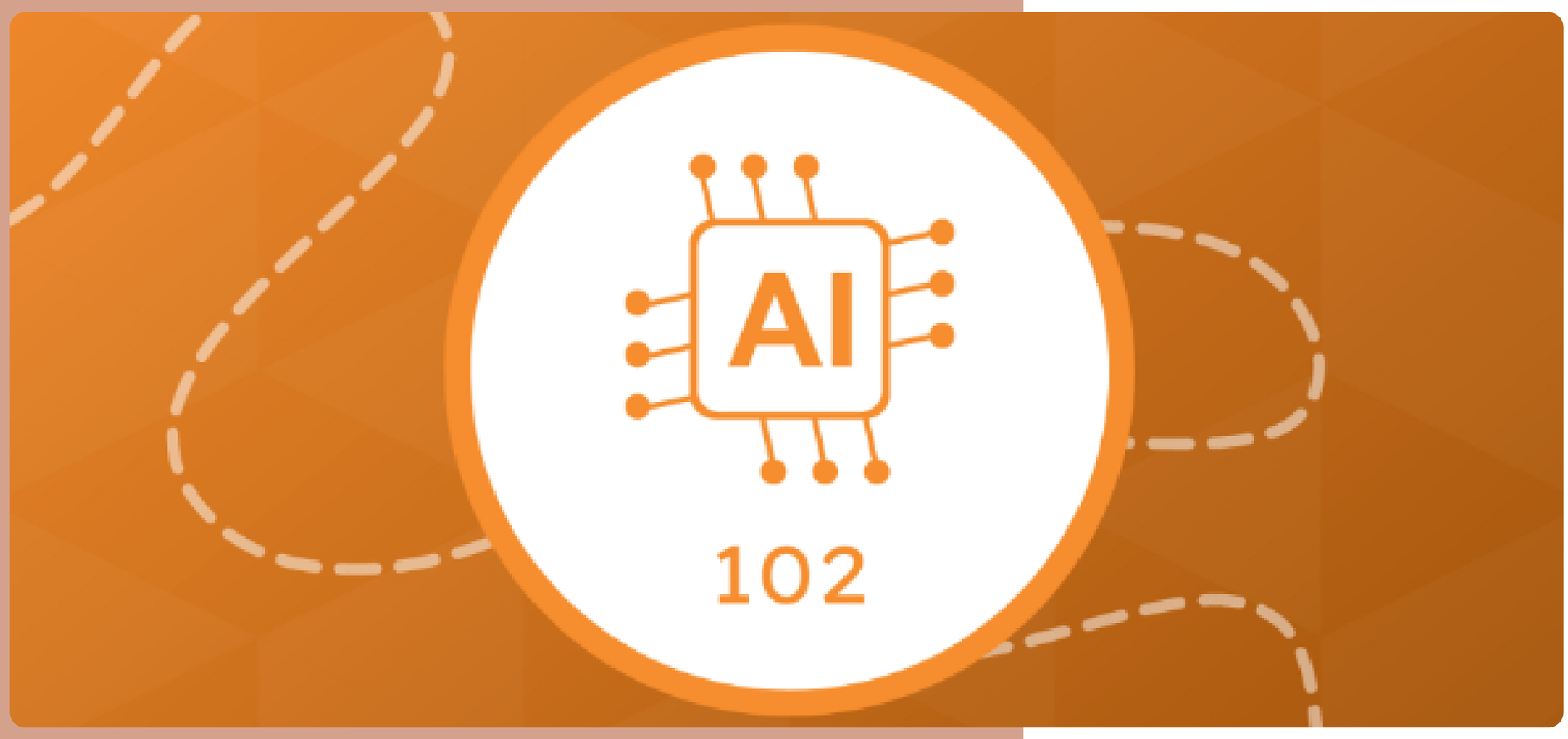
Importance for Students

For students in Electronics and Communication Engineering, mastering the basics is essential. A strong foundation in math, physics, and circuit theory is crucial for understanding advanced technologies. Practical experience through projects, labs, and technical societies like the NERIST Electronics Society helps connect theory with real-world applications.

Conclusion

Electronics continues to change the world, driving innovation and enhancing our lives. As technology evolves, the demand for skilled electronics engineers grows rapidly. By nurturing curiosity, creativity, and technical skills, students can make meaningful contributions to the digital revolution. The future belongs to those who harness the power of electronics to create a smarter, more connected, and sustainable world.

SHIVAM PRATAP
B.Tech 2nd Year



Bringing Intelligence to Academic Innovation

"Integrating AI & ML for Real-World Learning and Future-Ready Graduates"

In today's rapidly evolving world, the gap between academic learning and industry expectations is becoming increasingly evident. While students often excel in theoretical knowledge, many struggle to apply these concepts in real-world scenarios. This disconnect calls for a transformative approach—one that brings intelligence into academic innovation by integrating emerging technologies such as Artificial Intelligence (AI) and Machine Learning (ML) into our educational framework. Artificial Intelligence and Machine Learning are no longer limited to research labs or large technology firms; they are actively shaping industries including healthcare, finance, manufacturing, and education. Leading companies such as Google and Microsoft are consistently seeking professionals who not only understand concepts but can also apply intelligent systems to solve real-world problems. This shift presents both a challenge and a valuable opportunity for academic institutions.

Faculty members play a crucial role in bridging this gap. By integrating AI and ML into the curriculum—through dedicated courses, interdisciplinary projects, and practical workshops— we can transform the learning experience from passive knowledge acquisition to active application. This approach enables students to develop critical thinking, problem-solving abilities, and technical expertise that align with current industry demands.

Imagine classrooms where students do not just study algorithms but design intelligent systems; where assessments go beyond written examinations to include real-world case studies; and where innovation becomes a continuous practice rather than an occasional effort.

This is the kind of academic environment that prepares students not only to graduate, but to excel. Furthermore, platforms like Coursera and Kaggle demonstrate how accessible and impactful AI-driven learning can be. By incorporating such resources into academic practices, we can encourage students to explore beyond the syllabus and stay aligned with global advancements.

The benefits of this integration extend far beyond academics. Students equipped with AI and ML skills become more competitive in the job market, leading to improved placement opportunities and stronger industry engagement. In an era where employers prioritize skills and practical knowledge, this shift can significantly enhance both student outcomes and institutional reputation.

However, this transformation requires a collective willingness to evolve. It calls for educators to embrace continuous learning, adopt modern teaching methodologies, and experiment with innovative approaches. While this may present initial challenges, it also offers an opportunity to redefine the role of educators—not just as teachers, but as facilitators of future-ready talent.

The need of the hour is not just to teach—but to innovate. By embracing AI and ML, we can transform education into a system that is intelligent, relevant, and future-ready.

Because the future belongs not to those who only learn—
but to those who learn what the future demands.

PRANITA ROY
B.Tech 1st Year

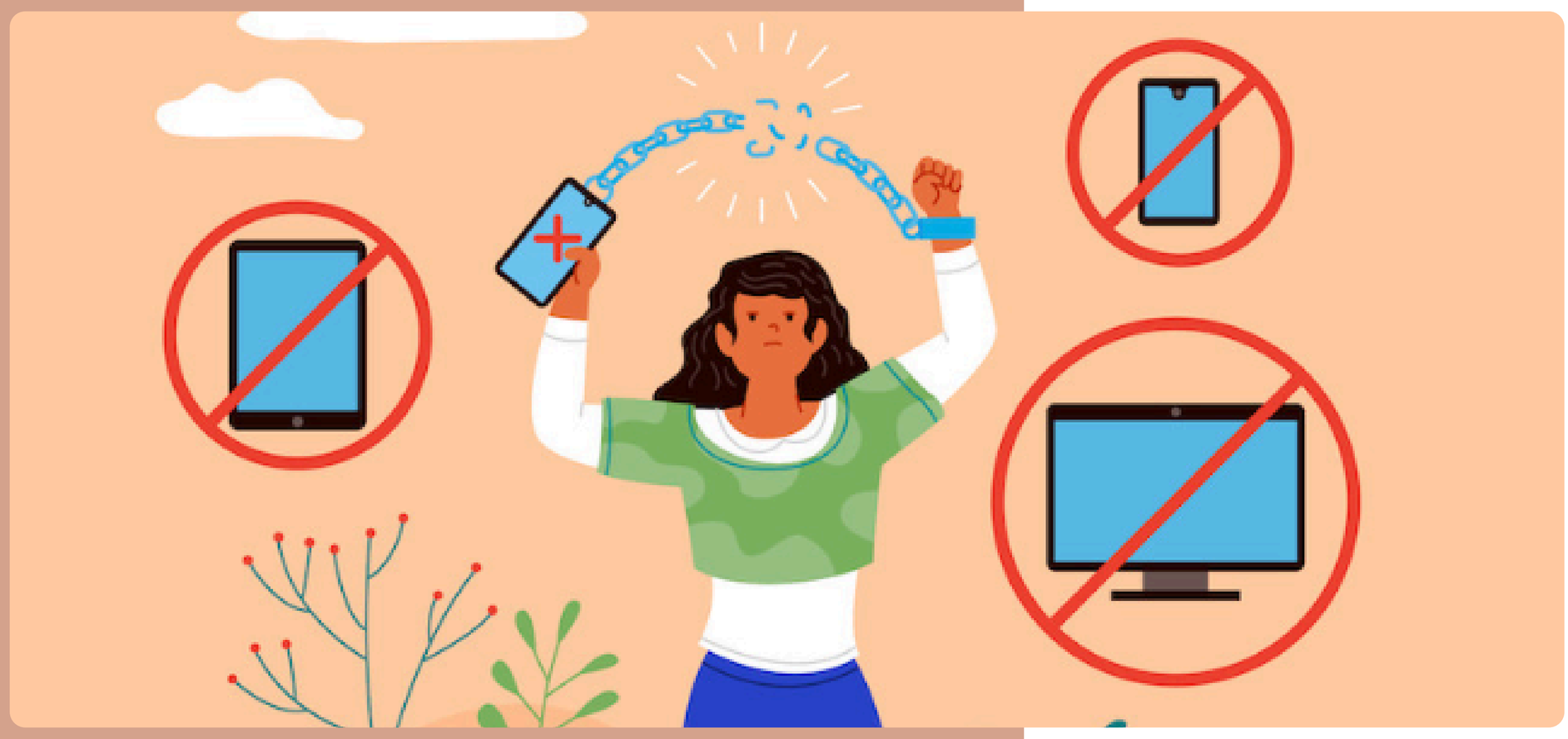
A little light

In the quiet of the night,
When stars begin to glow,
A little light inside your heart
Will always softly show.

Through the clouds and heavy rain,
When days feel cold and long,
That tiny spark within your soul
Will guide you, keep you strong.

So hold it close and let it shine,
No matter wrong or right,
For even in the darkest times,
You are your own bright light.

F.LALNUNSANGI
B.Tech 1st Year



A DAY WITHOUT ELECTRONICS...

WHAT WOULD HAPPEN ?

Imagine waking up one day and all electronic devices stop working. No phone alarms, no lights, no internet, and no television. At first, it may feel calm and quiet, but soon we realize how much we depend on electronics. In today's world, electronics are a very important part of our daily life, helping us in communication, work, education, and many other activities.

Without electronics, many problems would arise. Communication would become very slow because phones and the internet would not work. Transportation systems like traffic lights, trains, and flights would stop, causing confusion and delays. Hospitals would face serious difficulties because machines like ventilators and monitors would not function. At home, daily tasks like cooking, washing, and storing food would become hard. Schools and offices would also stop working properly without computers and online systems.

A day without electronics would show us how important they are in our lives. Even though people might spend more time together and talk more, the problems would be much bigger. Electronics help the world run smoothly, and without them, life would become difficult. This reminds us that electronics are not just machines, but essential tools that support modern life.

IRAM KHAN
B.Tech 1st Year

Signals in Silence

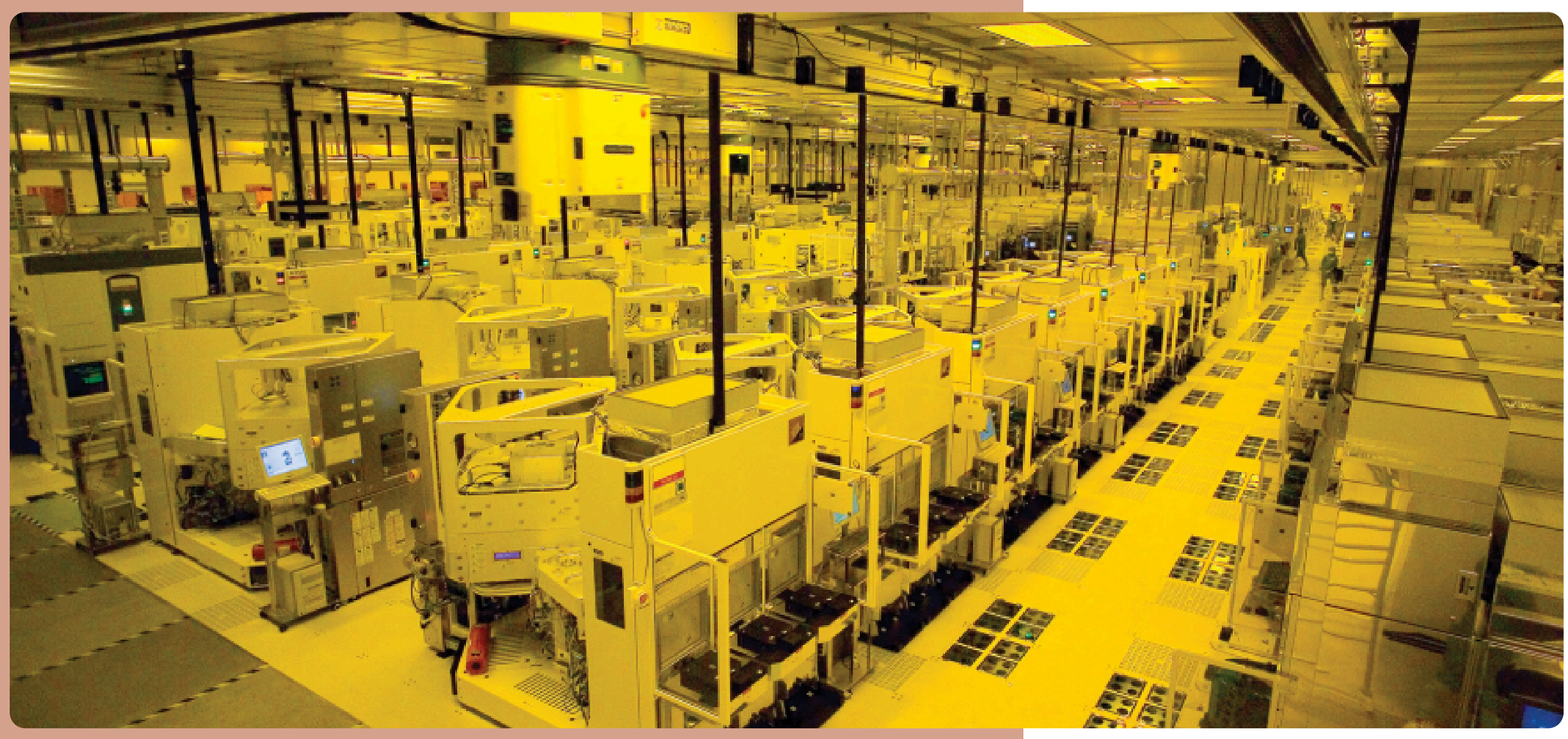
In a world of unseen waves,
Where silence speaks and data behaves,
Flows a rhythm, sharp and bright,
A coded pulse of hidden light.

Through wires thin and circuits deep,
Secrets travel, never asleep,
Zeros and ones, soft and true,
Carrying dreams from me to you.

A whisper flies across the sky,
Through towers tall, it passes by,
A distant voice feels close, like near,
That’s the magic engineers pioneer.

Not just machines, not just design,
We shape a world, one signal at a time,
Connecting hearts, both far and near,
Through innovation, bold and clear.

ANTARIKA BISWAS
B.Tech 1st Year



SEMICONDUCTOR TECHNOLOGY AND MODERN SCIENCE

Introduction

Semiconductor are the heart of modern technology. India is aggressively building a robust semiconductor ecosystem through the India Semiconductor Mission (ISM) and PLI schemes, aiming for a $100-110 billion market by 2030. They are used in smartphones, computers, electric vehicles, satellites, and artificial intelligence systems. Semiconductor chips control, process, and store data. Today, the semiconductor industry is growing rapidly worldwide, and India is also trying to become a major player.

What is a Semiconductor?

A semiconductor is a material that has electrical conductivity between a conductor and an insulator. It can control the flow of electric current, making it useful in electronic devices. Silicon is the most commonly used semiconductor material because of its efficiency and availability. Semiconductors are used to manufacture integrated circuits or chips, which perform functions such as processing data, storing information, and controlling electronic systems. These chips act as the "brain" of modern electronic devices.

Global Semiconductor Market

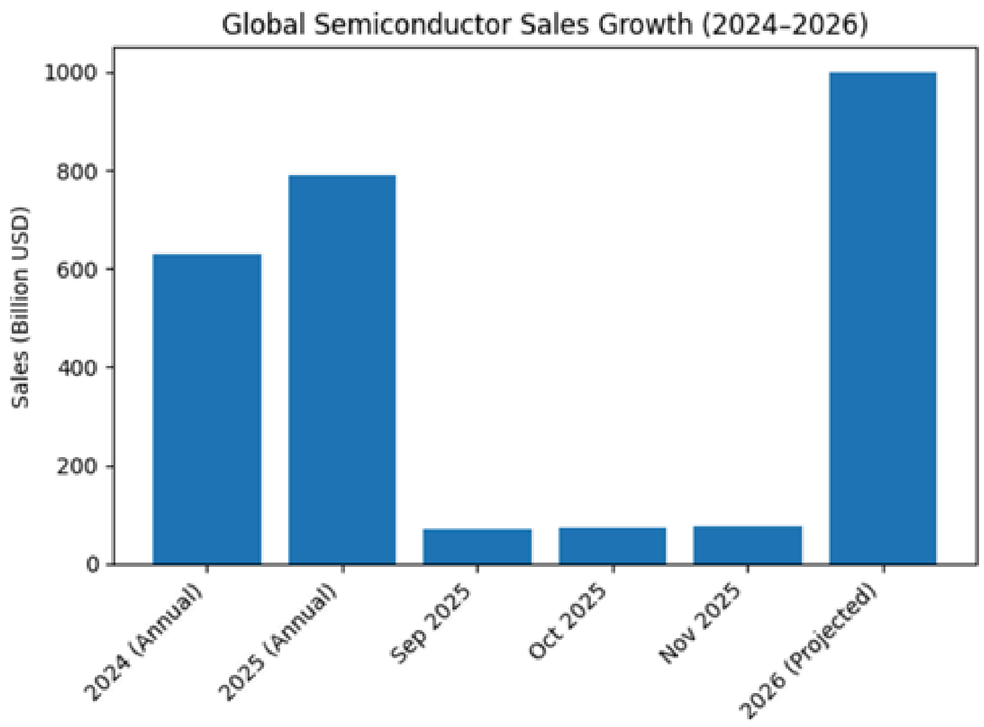
The global semiconductor industry showed strong growth in 2025 and is expected to expand further in 2026. According to the Semiconductor Industry Association (SIA), worldwide chip sales increased significantly due to rising demand for logic and memory chips, artificial intelligence, 5G technology, cloud computing, and advanced electronics.

Global semiconductor sales reached **$791.7 billion in 2025**, a **25.6% increase** from **$630.5 billion in 2024**. The fourth quarter alone generated **$236.6 billion,** showing strong market demand. In the third quarter of 2025, sales totaled **$208.4 billion**, which was **15.8% higher than the second quarter.**

Monthly data also showed rapid growth. In **September 2025**, global sales reached **$69.5 billion,** a **25.1% increase compared to September 2024.** Sales rose further to **$72.7 billion in October 2025,** showing a **4.7% increase from September** and a **27.2% rise from October 2024.** The industry recorded its **highest-ever monthly sales in November 2025,** reaching **$75.3 billion**, a **29.8% increase from November 2024.**

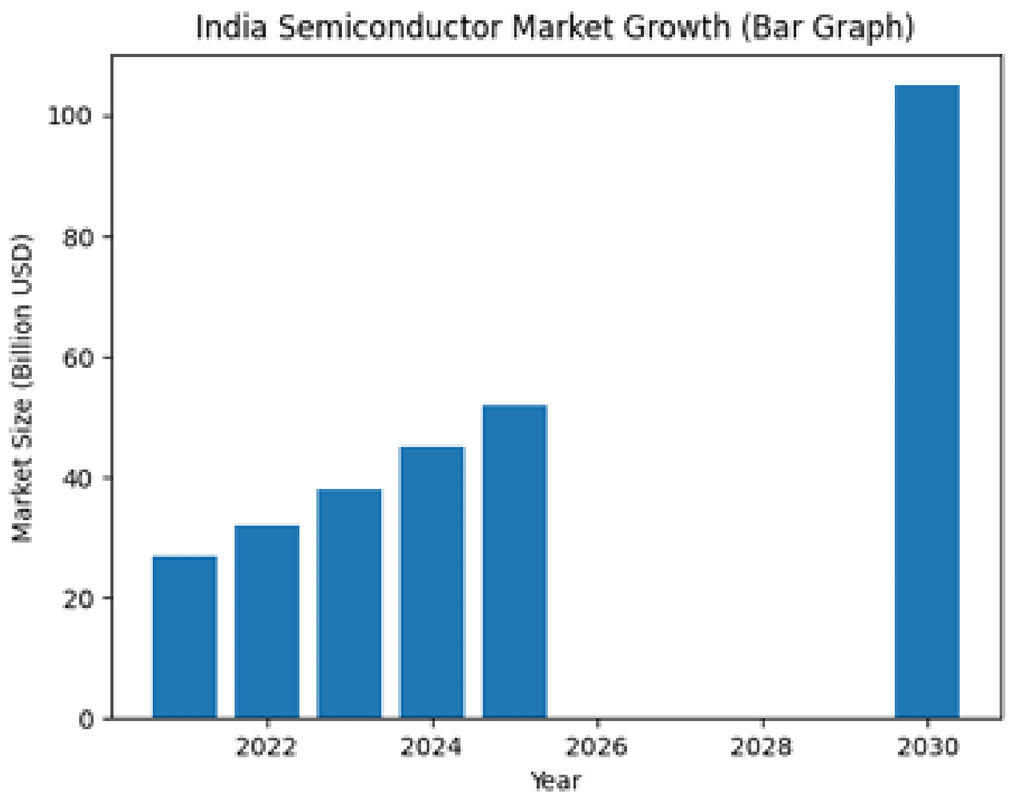
Logic and memory products showed the largest growth among semiconductor categories. According to the World Semiconductor Trade Statistics (WSTS), global semiconductor sales are projected to reach nearly **$1 trillion by 2026.**

Overall, the semiconductor industry remains a major driver of technological innovation and economic growth worldwide.



Global Semiconductor Market

India's semiconductor market is growing rapidly, although it is still much smaller than the global market. The government is actively developing the sector through initiatives like the India Semiconductor Mission (ISM) and Production Linked Incentive (PLI) schemes to build a strong semiconductor ecosystem.
2023: India's semiconductor market was about $34 billion.
2024: Increased to around $38 billion due to rising electronics demand.



Global vs India Semiconductor Market Comparison

Factor	Global Market	India Market
Market Size (2025)	$791.7 billion	$50-54 billion
Growth Rate	High	Very fast growth
Manufacturing	Highly developed	Developing stage
Demand Drivers	AI, EV, 5G, data centers	Smartphones, EV, digital growth.

This comparison shows that while the global semiconductor market is much larger, India is emerging as one of the fastest-growing market.

Future Scope and Challenges of India's Semiconductor Industry

India's semiconductor industry is expected to grow rapidly due to rising demand for electronics and strong policy support. The Indian semiconductor market is projected to expand from about **$34 billion in 2023** to nearly **$100–110 billion by 2030.** At the global level, semiconductor sales reached **$791.7 billion in 2025** and are expected to approach **$1 trillion by 2026,** according to the Semiconductor Industry Association, creating major opportunities for emerging markets like India.

To support this growth, the Government of India has launched initiatives such as the India Semiconductor Mission (ISM) to develop domestic chip manufacturing and reduce import dependence. The expansion of electric vehicles, 5G technology, and artificial intelligence is further expected to drive semiconductor demand in the country.

In recent years, some segments of the semiconductor industry have grown—such as chips for use in AI and autonomous and electric vehicles—while others have contracted, including chips that are used to power smartphones and computers. Rapidly changing market dynamics can make it difficult for leaders in the industry to set production targets. McKinsey analysis indicates that using analytics to improve existing manufacturing sites can make changes that are often faster, more cost-effective, and more sustainable than expanding manufacturing altogether.

Conclusion

Semiconductors play a vital role in modern technological advancement and global economic growth. With rising demand and strategic initiatives such as the India Semiconductor Mission by the Government of India, India is emerging as a promising player in the global semiconductor industry. Despite existing challenges, continued investment, policy support, and innovation are expected to strengthen India's technological capabilities and global competitiveness in the coming years.

IRAM KHAN
B.Tech 1st Year

Echoes of a Fading Melody

Quaint little melody that I hear,
One so comforting.
On the hills I lay claim to,
Embrace of the blue skies,
Bountiful harvest of the lord.
Bless this land that I call home.

The melody fades,
I cannot hear it any longer.
Sorrow does not reach for me,
Yet it lingers around.
Farewell to the hills I once claimed,
Calm winds that carry me.

Grant me blessings and take me.
I hear it no longer,
Now it troubles me no longer
A hum of the past that stays,
Now I hear something new;
Not unlike the melody of the past.
Quiet little moments hear it and,
Sing me a song of comfort.

ABINASH SAIKIA
Base 2nd Year

From 5G to 6G: The Future of Wireless Communication

Wireless communication has changed quickly over the past few decades. It has transformed how people connect and share information. The latest advancement, 5G, is already changing the digital world with its ultra-fast speeds, low latency, and high reliability. Compared to earlier generations, 5G can support many connected devices at the same time. This makes it perfect for applications like smart cities, self-driving cars, telemedicine, and industrial automation. One key feature of 5G is its very low latency, which enables real-time communication. This is essential for applications such as remote surgeries and self-driving cars, where even a small delay can have serious consequences. Additionally, 5G uses technologies like beamforming and millimeter waves to provide faster and more efficient data transmission.

However, researchers and engineers are already working on the next generation, 6G. It's expected to be available around 2030. 6G aims to take communication to a whole new level. It is predicted to offer data speeds up to 1 terabit per second, nearly 100 times faster than 5G. Moreover, 6G will focus on achieving near-zero latency, allowing for truly real-time communication systems. The potential applications of 6G are exciting and futuristic. These include holographic communication, immersive augmented and virtual reality experiences, smart environments powered by artificial intelligence, and advanced human-machine interactions. 6G may also connect to space-based communication systems, enabling seamless global connectivity even in remote areas.

For students of Electronics and Communication Engineering (ECE), moving from 5G to 6G brings many opportunities. Key areas of involvement include RF and microwave engineering, antenna design, signal processing, wireless communication systems, and network optimization.

Understanding the principles behind these technologies will help students contribute to the development of next-generation communication systems.

In conclusion, the journey from 5G to 6G marks a significant leap in wireless communication technology. As the need for faster and more reliable connectivity continues to grow, ECE engineers will play an important role in shaping the future of global communication.

RIMON SAIKIA
Base 2nd Year

Internet of Things (IoT): Building Smart Homes and Cities

The Internet of Things (IoT) is one of the most significant technologies in modern electronics and communication engineering. It refers to a network of connected devices that can collect, exchange, and analyze data through the internet. These devices range from simple sensors to complex systems, all working together to make daily life smarter and more efficient.

In smart homes, IoT is commonly used to automate household tasks. Devices like smart lights, thermostats, security cameras, and voice assistants can communicate with each other and be controlled remotely using smartphones. For instance, a smart thermostat can automatically adjust the room temperature based on user preferences, helping save energy and cut electricity costs.

IoT is also essential in developing smart cities. With the help of sensors and communication systems, city infrastructure can be monitored and managed more effectively. Traffic management systems use IoT to ease congestion by analyzing real-time data and adjusting traffic signals as needed. Similarly, smart waste management systems can detect when bins are full and schedule timely collections, improving cleanliness and efficiency.

The operation of an IoT system typically involves four main components: sensors, microcontrollers, communication networks, and cloud platforms. Sensors collect data from the environment, which microcontrollers then process. The data is transmitted through communication technologies like Wi-Fi, Bluetooth, or cellular networks to cloud platforms, where it is analyzed and used to make decisions.

For ECE students, IoT presents a wide range of learning and career opportunities. It combines essential subjects like embedded systems, digital electronics, communication engineering, and signal processing. By gaining knowledge in IoT, students can work in areas like automation, robotics, smart infrastructure, and industrial control systems.

In conclusion, IoT is shaping the future by creating intelligent environments that enhance efficiency, safety, and convenience. As technology continues to progress, IoT will become more integrated into daily life, making it an important area of study for aspiring ECE engineers.

ANGEL SAMANTHA DIENGDOH
B.Tech 1st Year

Forced Obedience

The wolf knows not sympathy,
The chains of survival weigh heavy; it is unfree.
A sinful smile, not innocent glee,
Its eyes twinkle in manipulative empathy.

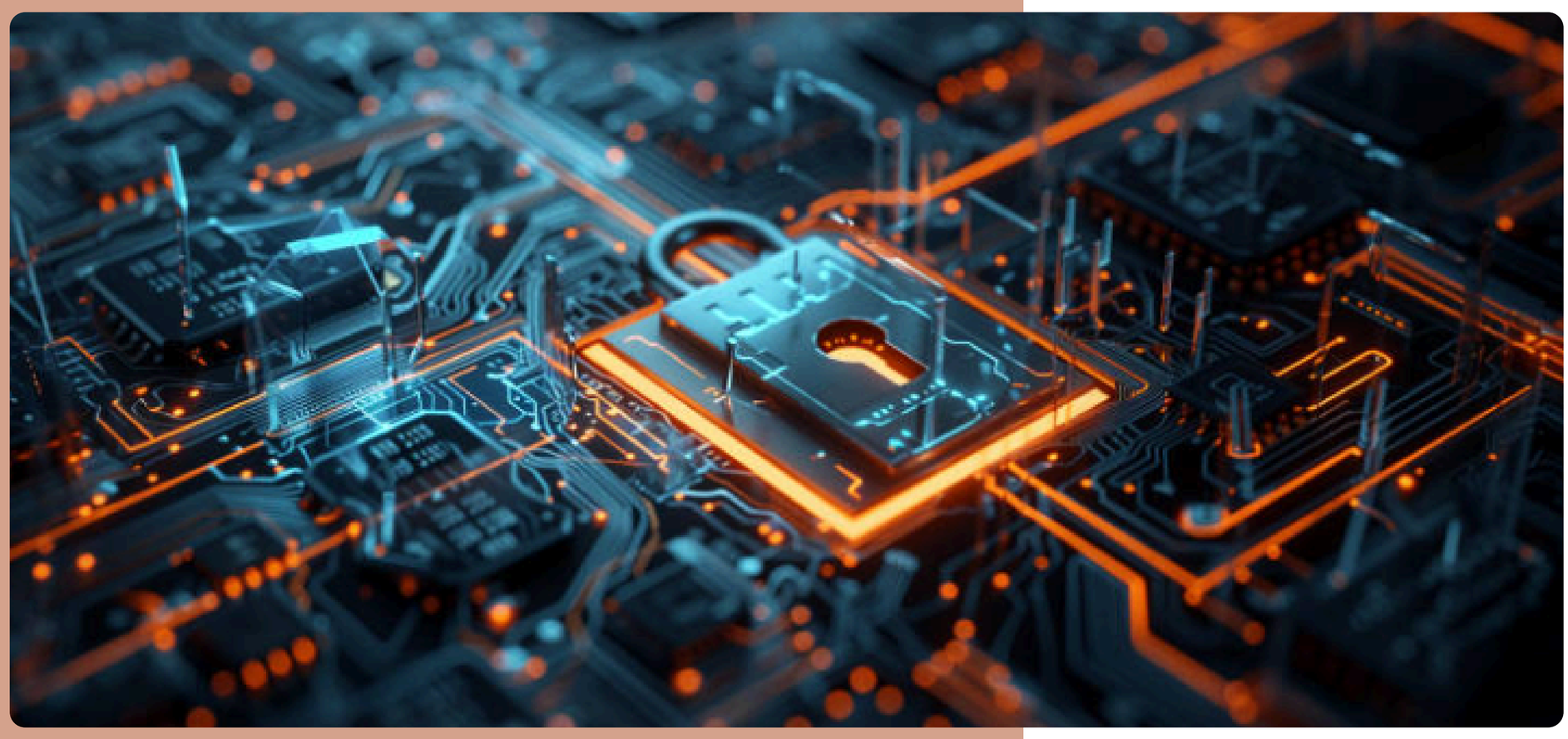
Its sharp teeth threaten the sheep.
Its ego for dominance leaps,
The sheep gather in heaps,
Their fear makes them lose sleep.

Surrounded, cornered, powerless
In the mind, but I digress.
Many follow the footsteps of the rest
But the one who forges its own path gets devoured less.

For a cub, young and naive,
Once taught forced obedience, a punished Eve.
It knows not how to turn over a new leaf
Rather with a bitter heart, it chooses to grieve.

Whether a sheep or a wolf, nature does not define.
The need for freedom, a constant pull,
When claws retract, the wolf is peaceful;
When cloven hooves run free, the sheep are refined.

RITURAJ DAS
Base 2nd Year



Cybersecurity in Communication Systems

In today's connected world, communication systems are crucial for everyday life. They include mobile networks, internet services, satellite communication, and IoT devices. As these systems improve, they also become more exposed to cyber threats. This makes cybersecurity a key part of modern communication engineering. Cybersecurity is about protecting communication systems, networks, and data from unauthorized access, attacks, or damage. In wireless communication, data travels through open channels, making it easier for attackers to intercept or alter information. Common threats include hacking, data breaches, eavesdropping, denial-of-service attacks, and malware.

With the rapid growth of technologies like 5G and the Internet of Things, the need for cybersecurity has grown significantly. IoT systems connect millions of devices to the internet, often with minimal security features. This results in many entry points for cyber attackers, putting entire networks at risk.

One key method for secure communication is encryption. Encryption changes data into a code that only authorized users can understand. Techniques like symmetric and asymmetric encryption are commonly used in communication systems to protect sensitive information. Authentication methods ensure that only legitimate users can access a system. Firewalls and intrusion detection systems monitor and block suspicious activities.

Network security is another vital aspect of cybersecurity. It involves protecting the integrity and reliability of communication networks. Engineers use different protocols and security measures to secure data transmission and stop unauthorized access. Regular software updates and vulnerability assessments are also necessary to keep systems safe.

For Electronics and Communication Engineering students, cybersecurity is an increasingly important area. It combines knowledge of communication systems, networking, digital electronics, and software. ECE engineers play a vital role in designing secure communication protocols, developing encryption algorithms, and ensuring safe data transmission across networks.

As cyber threats change, the need for skilled professionals in cybersecurity is rising quickly. Industries like banking, healthcare, defense, and telecommunications depend on secure communication systems to protect sensitive information.

In conclusion, cybersecurity is a critical part of modern communication systems. Keeping data and networks secure is essential for maintaining trust and reliability in today's digital world. For ECE students, learning about cybersecurity not only improves technical skills but also opens up exciting career opportunities in a fast-growing field.

PRATISTHA DEB
Base 1st Year

The Invisible Backbone of the Digital World

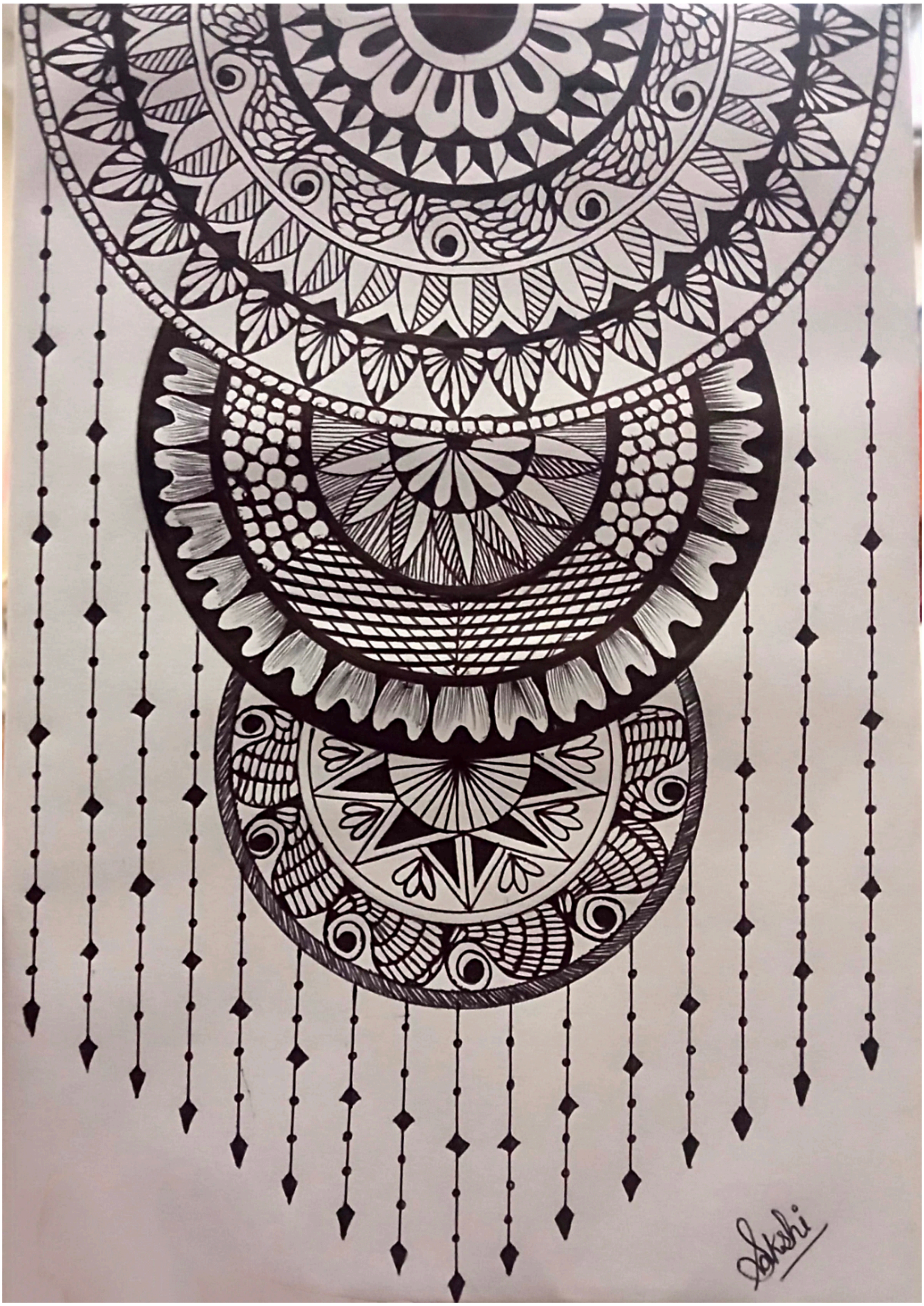
In today's digital age, we are surrounded by technology, from smartphones to smart homes. Behind all these innovations lies Electronics and Communication Engineering (ECE), the field that makes seamless connectivity possible. ECE focuses on transmitting and processing information through systems like satellites, fiber optics, and wireless networks. Whether it's a simple phone call or high-speed internet, everything depends on efficient communication systems working silently in the background.

With the rise of technologies like Artificial Intelligence and the Internet of Things (IoT), the role of ECE has become even more important. Smart devices, automated systems, and modern healthcare technologies all rely on electronics and communication to function effectively. Beyond convenience, communication systems play a crucial role during emergencies by enabling quick coordination and response. However, challenges such as data security and electronic waste remind us that innovation must also be responsible and sustainable.

In essence, ECE is not just a field of study- it is the backbone of our connected world, shaping the future in ways we often don't see but always depend on.

CREATIVE SECTION

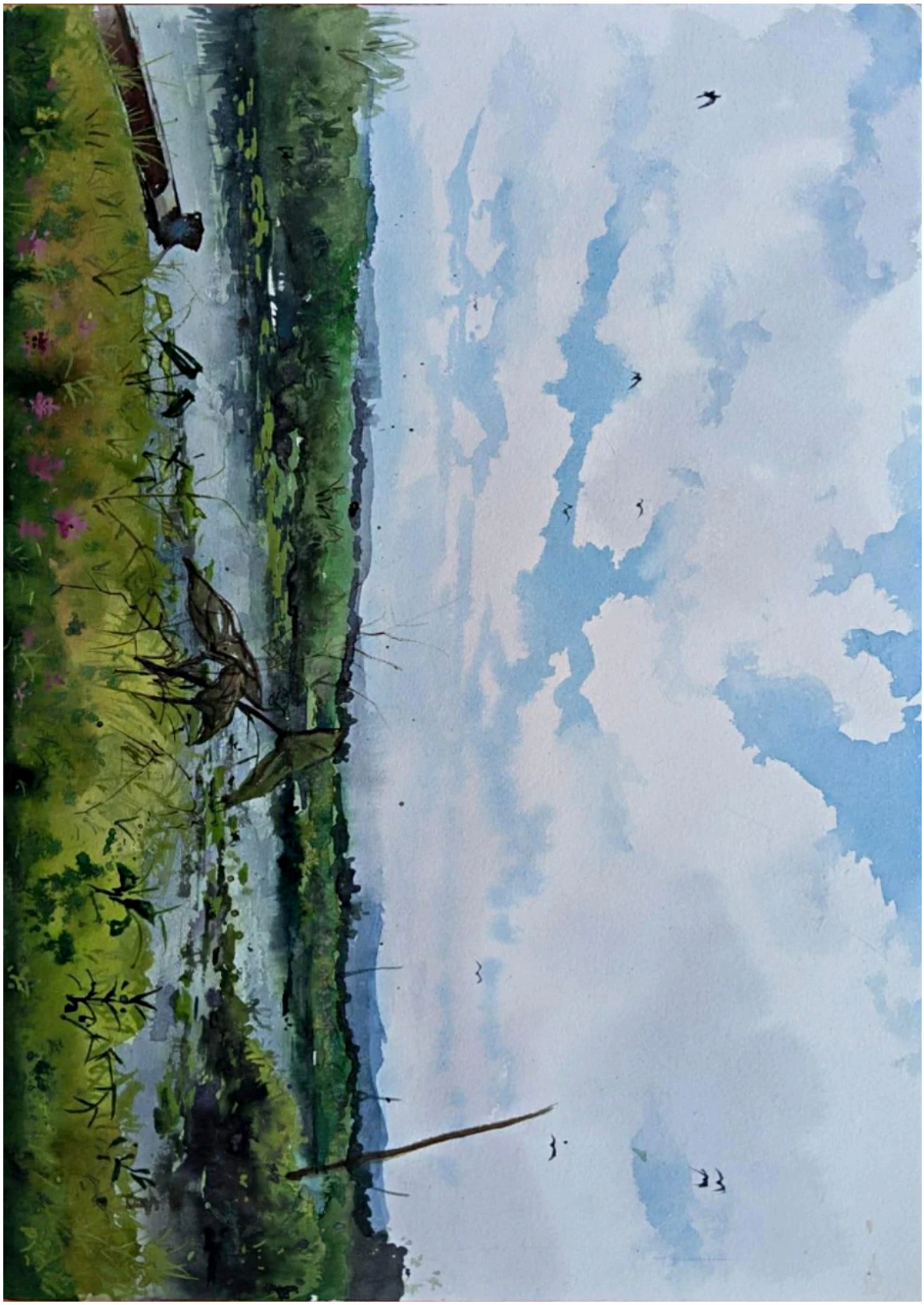
Mandala Art – A Universe Hidden in Patterns



-SAKSHI SHARMA
B.Tech 2nd Year

CREATIVE SECTION

Landscape – Whispers of Nature



-GUNESHWAR HIJAM
B.Tech 2nd Year

EC STUDY TOUR 2025-2026!

28th February 2026

IDEATHON

On 28 February, the NERIST Electronic Society (NES) organized an Ideathon on the theme "AI in Daily Life." The event provided students with a platform to present innovative AI-based solutions for everyday challenges, fostering creativity, teamwork, and technological innovation.

It also helped participants understand the growing role of Artificial Intelligence in modern society and its impact on different aspects of daily life, including education, healthcare, communication, and automation.

Through this initiative, NES encouraged students to think beyond conventional approaches and use technology as a tool for innovation and development. The Ideathon concluded with appreciation for the participants' efforts and highlighted the importance of nurturing young minds in emerging technologies like Artificial Intelligence.

8-9 May 2026

MAiTRI 2026

Inaugral Day

The North Eastern Regional Institute of Science and Technology (NERIST), Nirjuli, Itanagar, inaugurated the International Conference MAiTRI-2026 (MAchine inTelligence for Research & Innovations) on May 8, 2026.

The inaugural ceremony began with the felicitation of Chief Guest Prof. Narendranath S., Director, NERIST, and Guest of Honour Dr. Prabodh Borah, Director of Research (Veterinary Science), Assam Agricultural University. The event featured the traditional lamp lighting, followed by addresses from distinguished guests and faculty members. The first day focused on emerging AI and ML technologies, research innovations, and knowledge exchange, with participants presenting research papers and discussing current trends, challenges, and future opportunities in intelligent computing.

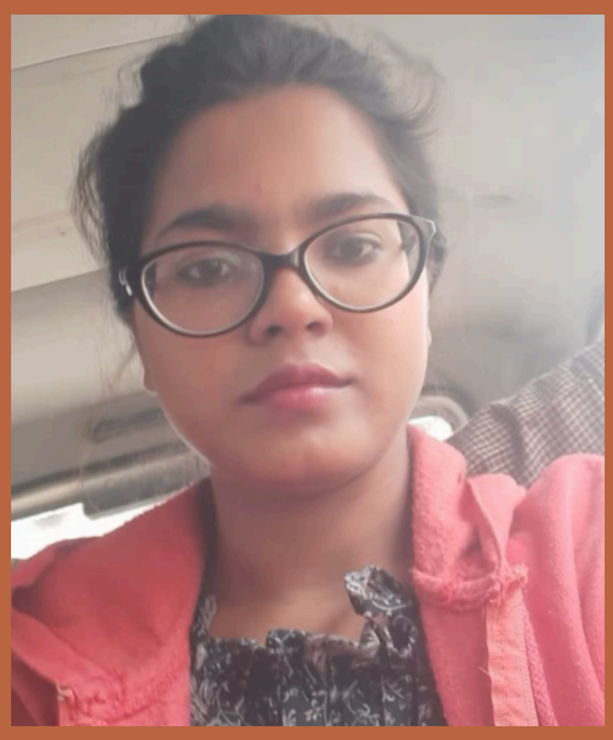
FINAL DAY

The second day of MAiTRI-2026 continued with technical sessions, research presentations, and expert discussion on Artificial Intelligence, Machine Learning, and advanced computational research. Keynote sessions by national and international experts highlighted the latest developments and future scope of AI-driven technologies. The conference provided a platform for collaboration among researchers, students, and professionals, encouraging innovation and academic partnerships. The organizing committee, including Prof. Joyatri Bora Hazarika (General Chair), Dr. Kurmendra, and Dr. Chitranajan Kumar Rai (Organizing Chairs), thanked all guests, participants, sponsors, faculty members, volunteers, and media representatives for their valuable contributions. MAiTRI-2026 successfully reflected NERIST's commitment to promoting research, innovation, and excellence in emerging technological fields.

MAGAZINE COMMITTE

DR. ASHOK KUMAR RAY

KARTIKEY SINGH



SHAILJA KAUSHAL

SUSHMA KUMARI

AKASH CHETRY