Bit – XI
DECEMBER 2024

Bits && Bytes

EC NEWSLETTER

Ocean Of Career Opportunity in Electronics & Communication

VISION

- **To impart excellent technical education for developing ethically sound and globally competent skills to girls opting for engineering as a career in the revolutionizing era of electronics and communication**

MISSION

- **To provide a creative environment for innovation in the field of Electronics & Communication through structured teaching learning process.**
- **To create a platform for effective interaction between Industry and Institute.**
- **To contribute to societal needs through innovation.**
- **To inculcate a self-learning attitude, environment skills and professional ethics among students so as to enable them to contribute for sustainability of environment and serve the society.**

ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT

GOVERNMENT POLYTECHNIC FOR GIRLS OPP. PRL, GUJARAT UNIVERSITY ROAD, NAVARANGPURA, AHMEDABAD – 380 015

Acknowledgment

Electronics and Communication Engineering Department of Government Polytechnic for Girls, Ahmedabad feels thrilled to present its genuine stakeholders "Bits & Bytes" a semester newsletter. This newsletter "Bits & Bytes" started with an objective of knowledge sharing and spreading divergent activities of Electronics and Communication Engineering Department. We would also like to focus on new developments in Electronics and Communication field, latest ongoing and upcoming trends and events, previous month's news and events.

We consider, a newsletter "Bits & Bytes" as a best place to appreciate the students, faculty members and stake holders for their achievements. We hope, this newsletter provides necessary motivation to the stake holders as well as also very much helpful to update our knowledge of fast growing Electronics and Communication field.

Finally, we would like to expand our deepest gratitude to all members who directly or indirectly involved and give their valuable support for making this newsletter "Bits & Bytes". We know that without grace of all mighty GOD this thing is not possible. So, here by we present the first Bit (Volume) of "Bits & Bytes".

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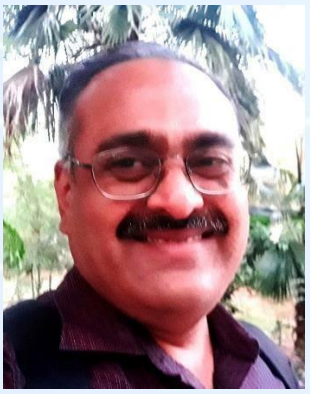
Message from Principal's Desk



Prof. Bhasker J. Iyer

"Technology is the Gift of God. After the gift of life, it is perhaps the greatest God's gifts. It is the mother of civilization, of arts and of sciences."

-Freeman Dyson

Government Polytechnic for Girls - Ahmedabad (GPGA), a premier diploma engineering institute was established in the year 1968 with the aim to provide technical education to girls in the heritage city of Ahmedabad. It is located right opposite to PRL and adjacent to ATIRA, in the throbbing educational hub within the heart of the city and in the vicinity of reputed institutes like L.D.College of Engg., Gujarat University, L.M.College of Pharmacy and the world renowned CEPT University. It is endowed with a beautiful green campus which has its own flora and fauna.

At present, GPGA offers 3-year diplomas in 6 programmes under Commissionerate of Technical Education and is affiliated with Gujarat Technological University (GTU). These are Diplomas in Architecture Assistantship (DAA), Biomedical Engineering (DBE), Computer Aided Costume Design and Dress Making (DCACDDM), Civil Engineering (DCE), Computer Engineering (DCoE), Electronics and Communication Engineering (DEC) and Information Technology Engineering (ITE).

GPGA has a tradition of imparting quality technical knowledge and ethical values to the students. No wonder GPGA is ranked among top 10 government diploma engineering colleges in Gujarat consistently over the last five years.

For years, the institute's major focus and concern have been our students and our institution strives to impart the best knowledge in respective fields for promoting and pursuing multidisciplinary diploma engineering in the most disciplined manner. Every student of the institute has been among some of the best talents of the vibrant state of Gujarat. Many of GPGA's alumnae have established themselves as entrepreneurs while some have continued higher studies with well-known engineering institutes of India as well as abroad. Thus, they have carved a niche for themselves in various technical fields throughout the state, our nation and even abroad.

The institute has an excellent track record of placements in past few years and students of GPGA have proved their mettle in industry, academics, and administration over the last many years. This glory has been due to the synergetic efforts of management, learned faculty, dedicated staff and sincere students over these years. I urge everyone, including staff and students, to make excellent careers by availing the unique opportunity that GPGA provides through classroom teaching, laboratory instructions, industrial trainings and participation in sports, cultural and other extra- curricular activities of interest. Recently, formation of GPGA's Alumnae Association has also been undertaken.

During the current academic year, three programmed of GPGA i.e. DCACDDM, DCE and DCoE have initiated the process of application for Accreditation with NBA. For the faculty and administrators, accreditation promotes ongoing self-evaluation and continuous improvement and provides an effective system for accountability. For the institute or programme , accreditation enhances its national reputation and represents peer recognition. Thus to further the institute's aim towards excellence, accreditation process has been undertaken. I extend my best wishes to all staff members and students of these programmes for getting accredited in the year 2021.

I express my sincere gratitude to all our stakeholders for their continued support, cooperation and active involvement to make GPGA a citadel of Technical Learning, which sets its own benchmark.

Message from HOD's Desk

Prof. T. P. Chanpura

Dear Readers,

It gives me great pleasure to present you this 11th Bit (Volume 11) of December 2024.

Our department's journey in outcome-based education is stronger than ever, driven by innovation, industry collaboration, and hands-on learning. Our students are excelling in AI-integrated circuits, smart materials, and blockchain applications in electronics, demonstrating their ability to tackle real-world challenges with cutting-edge technology.

A heartfelt thank you to K.N. Chaudhari, M.R. Panchal, and our dedicated faculty members for their unwavering commitment to academic excellence, research, and mentorship. Your efforts continue to shape a dynamic learning environment that empowers students to achieve their full potential.

A special gratitude to our incredible student team, whose dedication and enthusiasm drive innovation within the department. A special mention to Dhruva Dhamsania and Anshika Saxena, final-year students of the Electronics and Communication Department, for their outstanding contributions to the latest edition of our departmental newsletter. Their dedication, creativity, and hard work in curating and presenting valuable insights have played a vital role in highlighting the department's achievements and advancements.

To our graduates—keep learning, keep growing, and keep making a difference! Your skills, passion, and curiosity will pave the way for groundbreaking innovations in the ever-evolving world of technology.

5G and Beyond Technologies(6G & Future Network):

5G Technology

5G (Fifth Generation) is the latest global wireless standard designed to provide faster speeds, lower latency, and greater connectivity compared to previous generations.

India's 5G Expansion

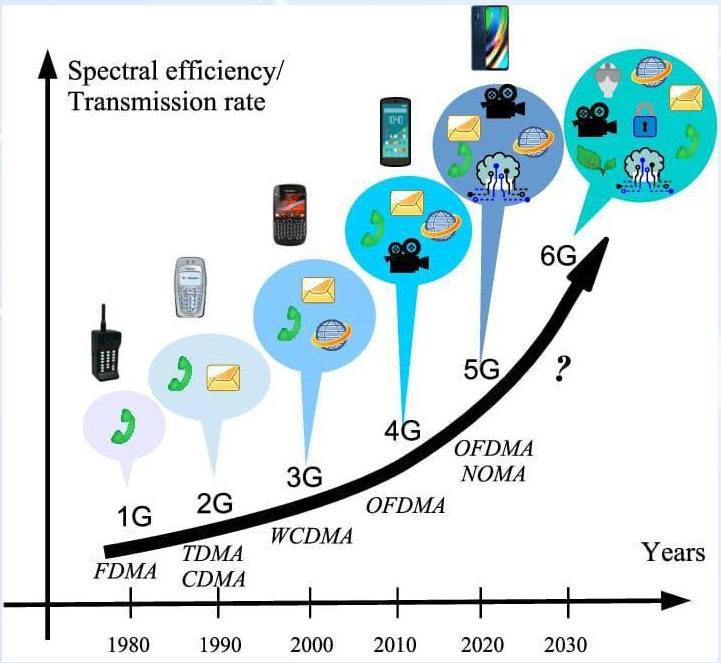
- **Subscriber Growth: India experienced rapid 5G adoption, with subscriptions projected to reach 270 million by the end of 2024, accounting for 23% of the country's mobile subscriptions. This surge is attributed to extensive 5G coverage and the availability of affordable services.**

Key Features of 5G:

- High Speed:* Up to *10 Gbps*, significantly faster than 4G.
- Low Latency:* As low as *1 MS*, enabling real-time applications.
- Massive Connectivity:* Supports *millions of IoT devices per square kilometers.
- Network Slicing:* Allows customized virtual networks for different applications.
- Improved Reliability:* Better performance in crowded areas and smart cities.

Applications of 5G:

- Autonomous Vehicles:* Real-time communication for self-driving cars.
- Smart Cities:* Efficient traffic management, surveillance, and energy systems.
- Healthcare:* Remote surgeries and AI-driven diagnostics.
- Industrial Automation:* Smart factories and robotics.
- Augmented & Virtual Reality (AR/VR):* Enhanced gaming and training simulations.



Beyond 5g :6G & Future Technologies :

6G (Sixth Generation) is expected to launch around 2030 and will further enhance wireless communication with AI-driven networks, terahertz waves, and quantum computing integration.

Key Features of 6G:

- **Ultra-Fast Speeds: 100 Gbps - 1 Tbsp, 100x faster than 5G.**
- **Extremely Low Latency: Sub-millisecond delays for real-time applications.**
- **AI-Powered Networks: AI will optimize performance, security, and automation.**
- **Terahertz (THz) Spectrum: Supports ultra- high-speed data transmission.**
- **Holographic Communications: Enables real- time 3D holograms for meetings.**
- **Quantum Communication: Provides ultra-secure encryption and faster computing.**

Potential Applications of 6G and Beyond:

- **Brain-Computer Interfaces (BCI): Direct communication between human brains and devices.**
- **Space Communication: High-speed satellite networks for global connectivity.**
- **Fully Autonomous AI Systems: Smarter IoT, robotics, and decision-making.**
- **Digital Twins: Real-time digital replicas of physical objects for simulations.**
- **Global Wireless Power Transmission: Wireless energy transfer for IoT and smart devices.**

What Is Deep Seek And How Does It Differ From ChatGPT?

Deep Seek is an open-source AI model that uses a Mixture-of-Experts approach, making it more efficient and cost-effective than ChatGPT.

It excels in technical tasks and mathematical computations, while ChatGPT offers better user experience and broader capabilities.

Deep Seek has established itself as a notable challenger to the widely adopted ChatGPT, bringing a fresh perspective to AI language models. As an open-source alternative, Deep Seek has drawn significant attention for its impressive capabilities and cost-efficient approach, particularly excelling in technical and mathematical domains.

Comparing AI Platforms: DeepSeek vs. ChatGPT

While ChatGPT maintains its position with versatile features and user-friendly interface, DeepSeek's emergence gives us a compelling reason to consider it as a real option.

Both platforms shape the future of AI in distinct ways through their unique approaches to natural language processing and problem-solving.

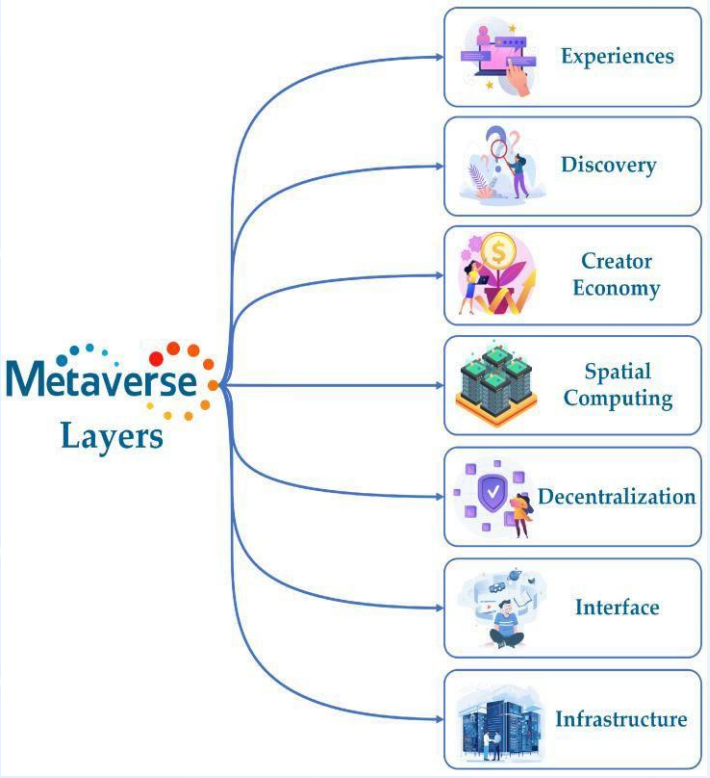
This comparison will help you understand the specific advantages each tool offers for different scenarios, from enhancing coding workflows to improving data analysis capabilities.

Deep Seek and ChatGPT are revolutionizing AI, driving innovation in language understanding and automation. As these technologies evolve, they open new doors for efficiency, creativity, and collaboration.

Feature	DeepSeek	ChatGPT
Pros	Open-source and cost-effective	Strong contextual understanding and refined language generation
	Efficient for coding and technical tasks	Reliable for general research and writing tasks
	Faster response times for structured queries	Better integration with multimodal capabilities (e.g. images voice)
	Superior performance in mathematical computations	More user-friendly interface
	Lower resource requirements	Consistent performance across various tasks
Cons	Potential biases in politically sensitive topics	Subscription required for premium access
	Requires more verification for complex responses	Higher computational costs
	Less intuitive interface for casual users	Message limits on free usage
	Stricter content moderation policies	Can be slower for technical computations

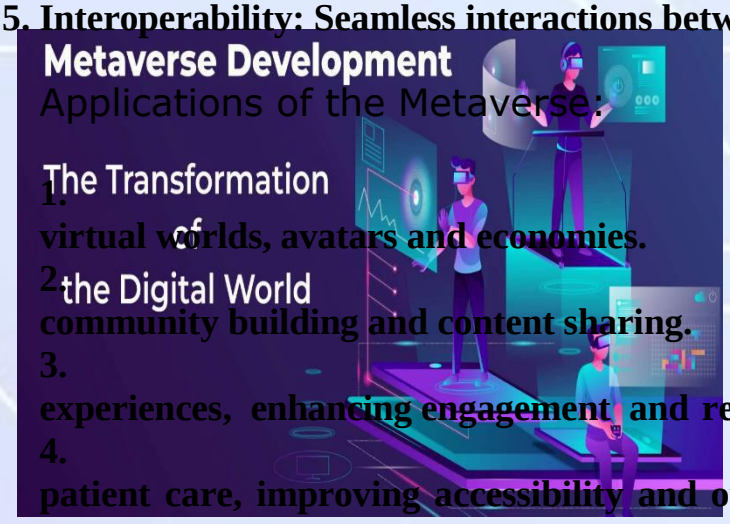
What Is Metaverse?

The Metaverse is a convergence of physical and virtual worlds, enabled by technologies such as Virtual Reality (VR), Augmented Reality (AR), Artificial Intelligence (AI), Blockchain and the Internet of Things (IoT). It's a decentralized, open and immersive environment where users can create, share and experience content in new and innovative ways.



Key Features of the Metaverse:

1. Immersive Experience: Interactive and immersive environments that simulate real-world experiences.
2. Decentralized: Built on blockchain technology, ensuring security, transparency and ownership.
3. Virtual Economy: A new economy based on digital currencies, assets and transactions.
4. Avatars and Identity: Users can create their own avatars, representing their digital identity.
5. Interoperability: Seamless interactions between different virtual worlds and platforms.



Applications of the Metaverse:

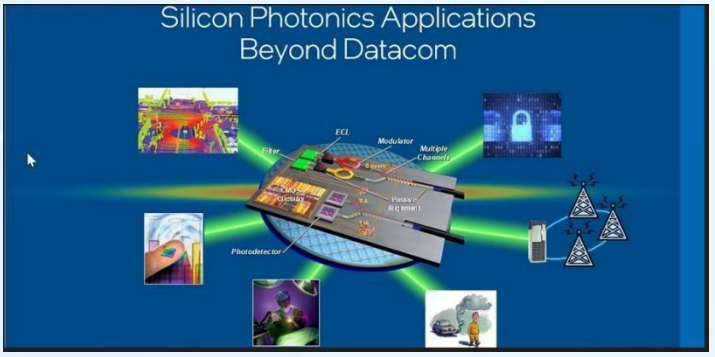
1. Gaming: Immersive gaming experiences with virtual worlds, avatars and economies.
2. Social Media: New forms of social interaction, community building and content sharing.
3. Education: Interactive and immersive learning experiences, enhancing engagement and retention.
4. Healthcare: Virtual therapy, treatment and patient care, improving accessibility and outcomes.
5. Commerce: Virtual shopping, product demonstrations and customer experiences.

Silicon Photonics And Its Future:

What is Silicon Photonics?

Silicon photonics is a cutting-edge technology that integrates optical components onto silicon- based microchips.

It leverages the existing semiconductor fabrication techniques used in electronics but enables data transfer using light instead of electrical signals.

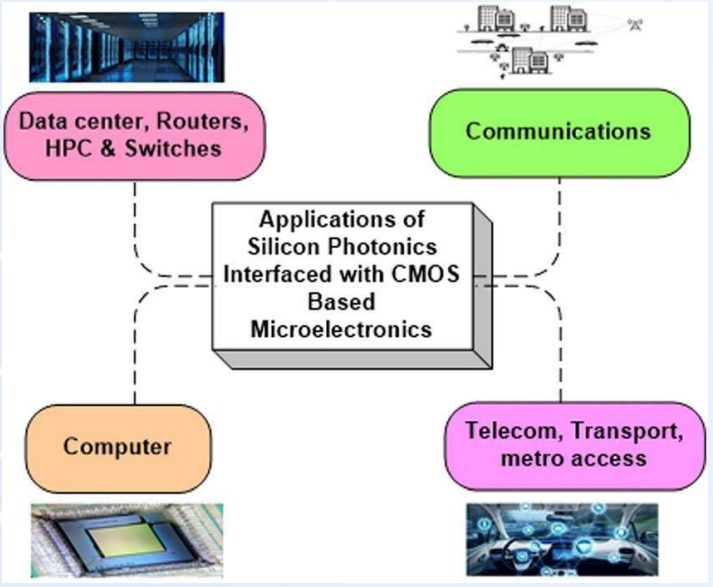


This allows for higher-speed, lower-power, and more efficient communication, especially in data centres, telecommunications, and high- performance computing.

Current Applications

1. Data Centres & High-Speed Internet – Silicon photonics is widely used for high-speed optical transceivers in data centres, enabling fast and efficient data transfer.

2. 5G & Telecommunications – Optical interconnects and transceivers improve signal transmission in next-gen 5G networks.



3. AI & High-Performance Computing (HPC) – Optical interconnects enhance data processing speeds for AI workloads.

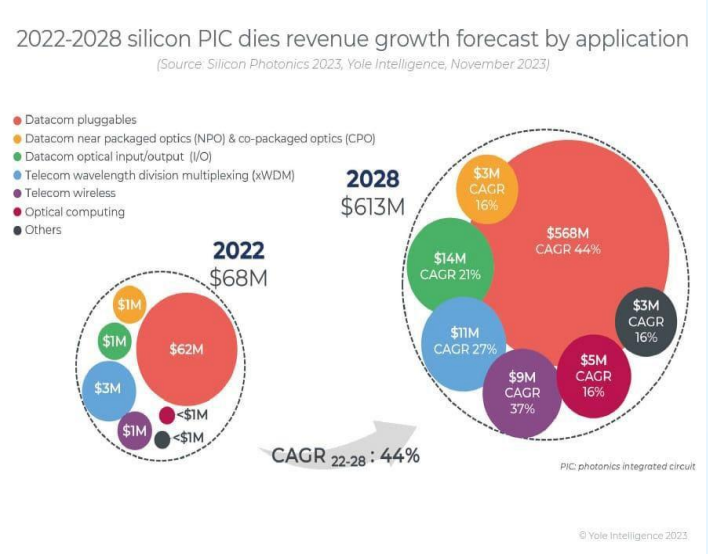
4. LIDAR & Sensing – Used in autonomous vehicles and healthcare applications like biosensors and medical imaging.

5. Quantum Computing – A potential enabler for optical quantum circuits in quantum computing research.

The Future of Silicon Photonics:

1. Next-Generation Computing
   - Optical interconnects replacing traditional electrical wiring in CPUs and GPUs for ultra- fast computing.
   - Potential integration in future AI and neuromorphic chips.

2. Expansion into Consumer Devices
   - Could enable high-speed optical communication in personal devices like laptops, AR/VR headsets, and smartphones.



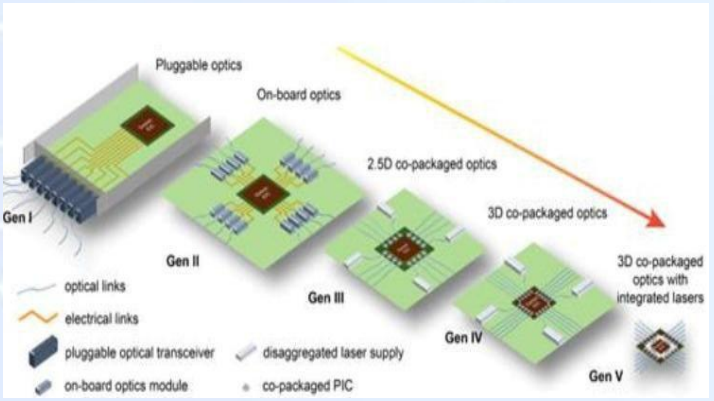
3. Breakthroughs in Optical Chips
   - Hybrid integration of III-V materials (e.g., indium phosphide) with silicon for better efficiency.
   - Advancements in silicon-based lasers and modulators.

4. Lower Power Consumption & Sustainability
   -Reduction in energy usage for global data centres, leading to greener computing.

5. Quantum Photonics & Optical Computing
   - Silicon photonics could play a key role in developing practical quantum processors, enabling secure communication and faster computations.

Challenges

- Integration with Electronics – Efficiently combining photonics with CMOS electronics remains a challenge.
- Manufacturing Complexity – Though based on silicon, photonic chips have unique fabrication requirements.
- Standardization & Cost – The technology is still evolving, requiring more standardization and cost reduction for mass adoption.



Extra-curricular Activity:

Teacher Day Celebration:

On September 5, 2024, our college came alive with enthusiasm and gratitude as we celebrated Teacher's Day in a unique and heartwarming way. Students took on the roles of teachers, stepping into their mentors' shoes to experience the joy and responsibility of educating others.
The day was filled with engaging activities, laughter, and a deep appreciation for our beloved educators. From conducting classes to delivering inspiring lessons, students showcased their admiration and respect for their teachers. The event was not only fun
but also an eye-opener, fostering a greater understanding of the dedication and hard work that goes into teaching.
The celebration concluded with a heartfelt thank-you note to all our teachers, acknowledging their invaluable contributions to shaping young minds.

Garba Day Celebration:

On October 8, 2024, our college was filled with vibrant colours, rhythmic beats, and boundless energy as students and teachers came together to celebrate Garba Night. The event was a perfect blend of tradition and enthusiasm, where everyone
enthusiastically participated in a spirited Garba competition.
Dressed in beautiful traditional attire, participants danced gracefully to the beats of folk music, creating an electrifying atmosphere. The competition was filled with excitement, friendly rivalry, and mesmerizing performances that showcased the rich cultural heritage of Garba.
The celebration brought everyone together, fostering unity, joy.

Ganesh Chaturthi Celebration:

On May 7, 2024, our college celebrated Ganesh Chaturthi with great devotion and enthusiasm.

The event began with the auspicious Ganesh Sthapana, where students and faculty gathered to welcome Lord Ganesha with prayers and chants, filling the campus with spiritual energy.

This joyous occasion reminds us of the power of faith, unity, and devotion. Let's embrace the teachings of Vignaharta and step forward with renewed hope and determination.

EC students are celebrating Ganesh visarjan, also studying the importance of the culture and cultural activities etc.

Co-Circular Activity:

Induction Training Program:

Visit to LD Museum: Understanding Cultural Heritage

As part of the Induction Training Program, students visited the LD Museum on 02/08/2024 to deepen their understanding of cultural heritage and its values. Under the guidance of two esteemed faculty members, Mrs. K.N. Chaudhari & Mrs. U.J. Shah, students explored various exhibits, gaining insights into historical artifacts and traditions. The visit was an enlightening experience that emphasized the importance of preserving and appreciating our rich cultural history.

IGTR(Indo German Tool Room):

Our students had an incredible opportunity to participate in the IGTR Workshop, which focused on cutting-edge technologies and hands-on technical training.

Scheduled from 2/9/2024 to 14/9/2024, this workshop provided in-depth training on PLC Programming, where students observed and studied PLC implementation on machines rather than operating them directly. With expert guidance from industry professionals, participants gained valuable insights into automation and industrial control systems. Kudos to all the attendees for making the most of this enriching experience.

Extra Co-Circular Activity:

Alumnae Meet:

On November 30, 2024, our college proudly hosted the much-awaited Alumni Meet, where former students reunited to relive their cherished memories and share their inspiring journeys.

The event was filled with nostalgia, laughter, and valuable insights as our pass-out seniors took the stage to express their gratitude and experiences from their time at the college.

The alumni shared their professional and personal growth, emphasizing the importance of education and how their time at the college shaped their careers. Their words motivated current students, encouraging them to strive for excellence and make the most of their learning opportunities.

Adding to the event's significance, senior Kanchan Sahu were also invited to witness the achievements of their former students, making it a truly emotional and proud moment for all.

The meet concluded with a heartfelt vote of thanks and a promise to stay connected as part of the ever-growing college family.

Mahatma Mandir Meet:

RE-Invest 2024 – A Transformative Learning Experience

On September 17, 2024, a group of 15 students, including 4 from the Electronics and Communication (EC) department, had the incredible opportunity to visit the RE-Invest 2024 event and exhibition at Mahatma Gandhi Mandir, Gandhinagar.

The event, focused on renewable energy and sustainability, provided deep insights into the future of clean energy innovations.

During the visit, students explored cutting-edge technologies in solar, wind, and bioenergy, interacted with industry experts, and gained knowledge about government initiatives promoting renewable energy.

Various companies and startups showcased their latest advancements, emphasizing the importance of transitioning to sustainable energy solutions.

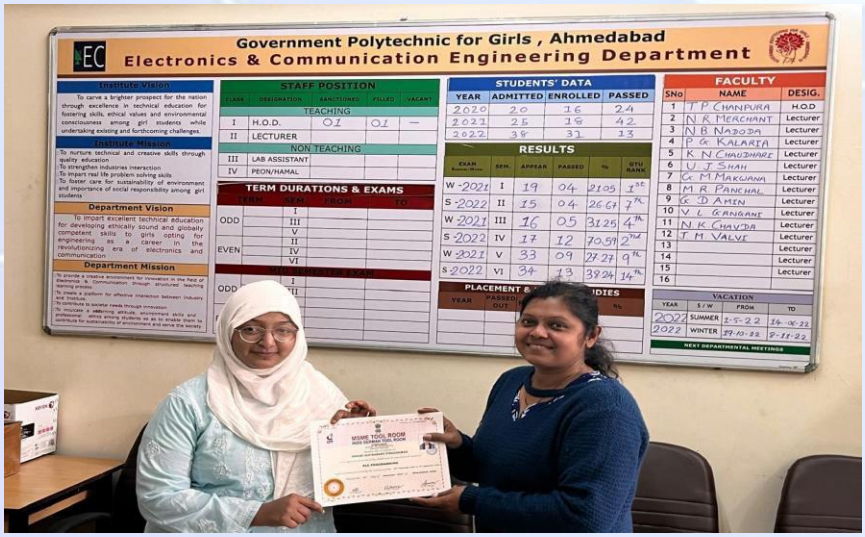
The visit was an eye-opener, reinforcing the significance of green energy, sustainable development, and technological advancements in shaping a better future. Students left with valuable knowledge, inspired to contribute to the field of renewable energy and innovation.

Sr.No	Name Of Faculty	Designation	Training Title	Training Duration	Training Span	Training Organise
1.	K.N. CHAUDHARI	LEC	Industrial Training	1/7/24 to 21/7/2	3 Weeks	GSECL, Surat
			Soft Skills Development	22/7/24 to 13/9/24	1 Week	NPTEL, AICTE, MOOC
2.	M.R. PANCHAL	LEC	Industrial Training	8/7/24 to 28/7/2	3 Weeks	KPIL
3.	G.M. MAKWANA	LEC	Industrial Training	8/7/24 to 24/7/2	3 Weeks	BISAG-N
4.	J.M VALVI	LEC	Industrial Training	8/7/24 to 26/7/2	3 Weeks	RUSAN PHARMA LTD
5.	V.L GANGANI	LEC	Industrial Training	22/7/24 to 10/8/2	3 Weeks	MCBS, GANDHAINA GAR
6.	U.J. SHAH	LEC	Industrial Training	8/7/24 to 28/7/2	3 Weeks	MCBS, GANDHAINA GAR
7.	N.R. MERCHANT	LEC	NEP-2020 Train The Trainers	14/10/24 to 18/10/2	1 Week	NITTTR, CHANDIGHA R & NCT
8.	G.D. ADMIN	LEC	Industrial Training	1/7/24 to 21/7/2	3 Weeks	MCBS, GANDHAINA GAR
			Semiconductor Electronics	2/9/24 to 6 /9/24	1 Week	GTU OF ENGINEERING & TECHNOLOGY & R AND D CELL

EC 2024 (Summer) Result Analysis:

Diploma semester 4 summer 2024				
S	BRANCH	TOTAL NO. OF	STUDENT WHO	TOTAL PERCENTA
1.	ELECTRONICS AND COMMUNICATION ENGINEERING	19	13	68.42%

IGTR certificate Distribution:



Student Achievement's:


CERTIFICATE
OF PARTICIPATION

PROUDLY PRESENTED TO

Dodiya Vratiksha Parasksumar

For Successfully Completing Quiz Competition regarding Har Ghar Tiranga Program on 12th to 14th August 2024.
We Acknowledge Your efforts, keep Participating.

Gymkhana Conveor
GGP AHMEDABAD

PRINCIPAL
GGP AHMEDABAD


GOVERNMENT OF GUJARAT | my GOV

CERTIFICATE OF PARTICIPATION

Government of Gujarat & MyGov congratulate

Acharyariyahimanshu

for successfully completing the

VIKAS SAPTAH | QUIZ

We acknowledge your efforts. Keep participating.

Shri Akash Tripathi
CEO, MyGov


G20 | my GOV

Certificate

OF PARTICIPATION

MyGov and Archaeological Survey of India congratulate

Acharyariyahimanshu

for successfully completing the **Heritage Quiz.**
We acknowledge your efforts. Keep participating!

Director General
Archaeological Survey of India

Student Art:

VISION

To carve a brighter prospect for the nation through excellence in technical education for fostering skills, ethical values and environmental consciousness among girl students while undertaking existing and forthcoming challenges.

MISSION

- **To nurture technical and creative skills through quality education.**
- **To strengthen industries interaction.**
- **To impart real life problem solving skills.**
- **To foster care for sustainability of environment and importance of social responsibility among girl students.**

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