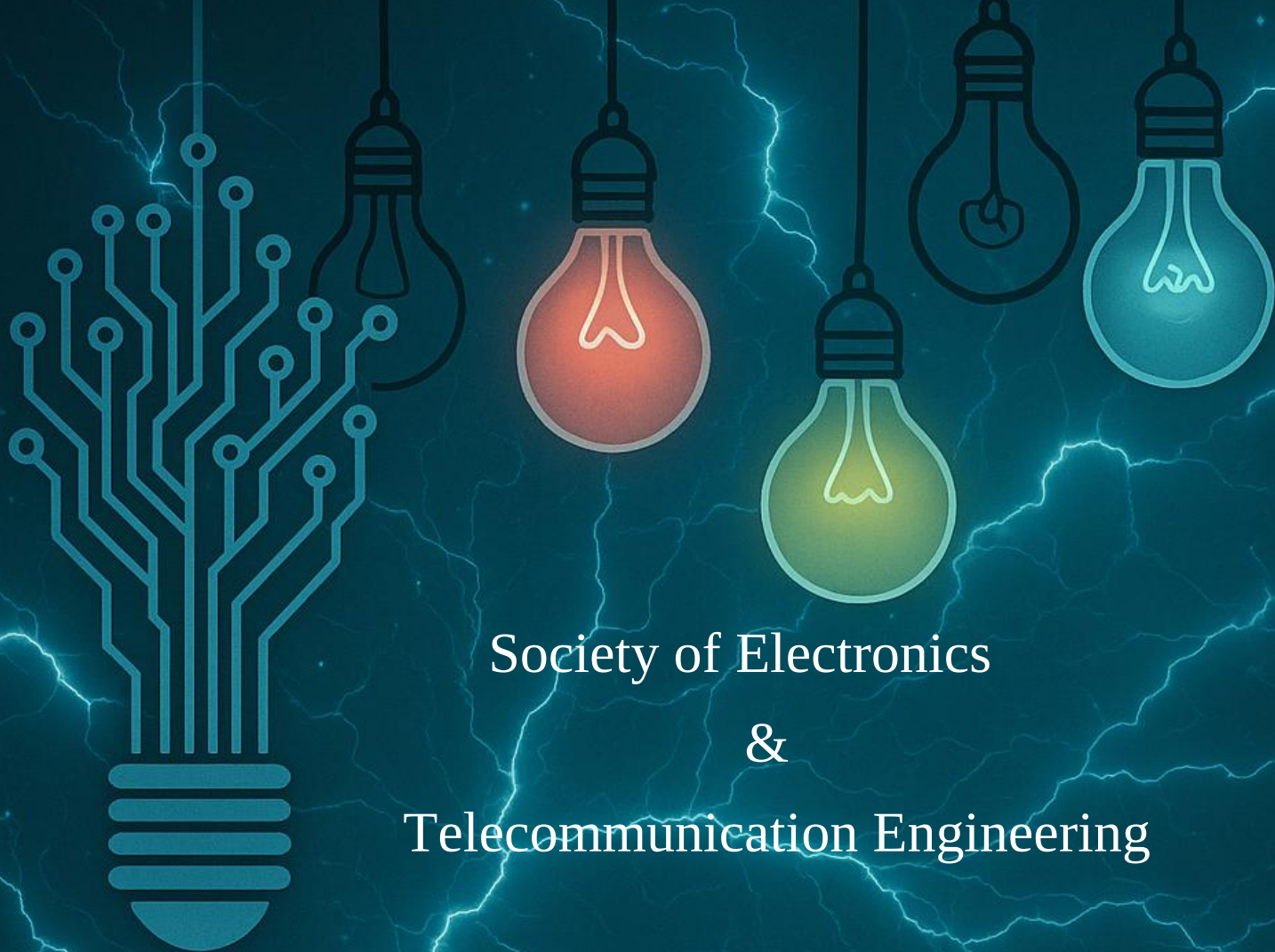




Society of Electronics

&

Telecommunication Engineering

NIRVANA

2024-25



<i>VISION</i>	To provide quality education in the field of Electronics and Communication Engineering to meet the challenges of Industry and society through a need-based curriculum, Industry – Institute Interaction, and student-centric teaching-learning process and produce diploma graduates with innovative and ethical standards.
<i>MISSION</i>	• To develop need-based curriculum by involving Industrial experts, academic experts, and alumni periodically to meet the needs of society. • To train the faculty in the recent trends in Electronics and Communication Engineering and teaching methodologies to provide a conducive learning environment for students. • To provide an environment for students to work as a team practicing interpersonal skills, social skills, and communication skills learn collaboratively, and develop their personality to face the challenges of society.

PO	• Basic and discipline specific knowledge. • Problem analysis • Design/development of solutions • Engineering tools, experimentation and testing • Engineering Practices for society, sustainability and environment • Project Management • Lifelong Learning
PEO	• Aim for advanced education in related subjects, such as electronics and telecommunication engineering. • Contribute to teaching, research, and other developmental activities of electronics & communication engineering and its allied fields. • Work in multicultural and multidisciplinary groups for the Sustainable development and growth of electronics and communication engineering projects and profession.
PSO	• Discipline knowledge: Apply the principles of communication and electronics engineering while designing embedded systems, implementing VLSI designs, communication systems, and other pertinent fields. • Problem-Solving Skills: Utilize software and hardware technologies to examine issues with electronics and communication systems.



Shri Sanjib Kumar Rout
Chairman of C.V. Raman
Polytechnic

Our longstanding commitment to academic excellence compels us to provide nothing but the very best in infrastructure, education and global learning. Our campus offers a stimulating environment that makes way for discoveries and makes our students independent thinkers and doers.



Mr. Rajendra Kumar
Prusti
Principal of C.V. Raman
Polytechnic

C.V. Raman Polytechnic, Bhubaneswar, established in 2005, envisions becoming a global leader in technical education by fostering innovation, industry collaboration, and holistic student development. With a strong focus on skill-building and future readiness, it aims to produce competent professionals who contribute meaningfully to society.



Mrs. Suchismita Satpathy
Hod of Electronics &
Telecommunication
Engineering

C. V. Raman Polytechnic fosters a holistic learning environment, focusing on both academic excellence and personal growth. Emphasizing life skills, communication, and overall development, the institution prepares students for real-world success. With strong industry connections and evolving teaching methods, it bridges education and career readiness effectively.



Editorial Board

Suchismita Satpathy

Prabhakar Rath

Subhalaxmi Barad

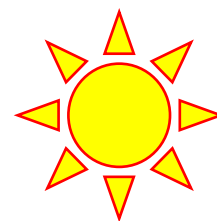
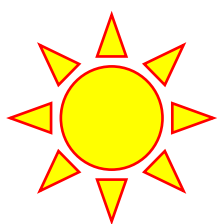
Ch. Gopal Prusty



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Satellite and Space Communication

Satellite and Space Communication

Introduction:

Satellite and space communication form the backbone of modern global connectivity. From television broadcasting to GPS navigation, weather forecasting, and deep-space exploration, satellite-based communication has transformed how we connect and share information across vast distances.

What is Satellite Communication?

Satellite communication is a type of wireless communication that uses satellites to relay and amplify radio telecommunications signals via a transponder. The signals are transmitted from an Earth-based station (uplink), relayed by the satellite, and sent back to another Earth station (downlink).

Types of Satellites Based on Orbits:

1. Geostationary Orbit (GEO) – Positioned about 35,786 km above Earth, appears stationary relative to Earth.
2. Medium Earth Orbit (MEO) – At altitudes between 2,000 km and 35,786 km. Often used for GPS.
3. Low Earth Orbit (LEO) – Around 500–2,000 km above Earth. Used for modern internet satellites like Starlink due to low latency.

Key Frequency Bands:

- L-band (1–2 GHz): GPS, mobile satellite services
- C-band (4–8 GHz): Satellite TV
- Ku-band (12–18 GHz): Direct broadcast services, VSAT
- Ka-band (26.5–40 GHz): High-speed satellite internet

Applications:

- Communication: Voice, video, and internet
- Navigation: GPS and GNSS systems
- Weather Forecasting: Meteorological satellites
- Earth Observation: Agriculture, disaster monitoring
- Military and Defense: Secure and global communication coverage

Space Communication:

While satellite communication mainly connects Earth-based locations, space communication also includes links between spacecraft (like Mars rovers) and Earth. This involves deep-space networks, highly directional antennas, and extreme precision.

Mr. Sabyasachi Patra

(Asst.Prof. ETC)

Quantum Communication

Introduction:

Quantum communication is an emerging field that leverages the principles of quantum mechanics to enable ultra-secure transmission of data. Unlike classical communication, it is theoretically immune to eavesdropping, making it ideal for future security systems.

Key Concepts in Quantum Communication:

1. Quantum Entanglement: Two particles become entangled such that the state of one instantly determines the state of the other.
2. Quantum Superposition: Particles can exist in multiple states simultaneously, enabling new data encoding methods.
3. No-Cloning Theorem: Quantum states cannot be copied, ensuring detection of any interception attempt.

Quantum Key Distribution (QKD):

One of the most practical applications of quantum communication. QKD allows two parties to share a cryptographic key securely. If an eavesdropper tries to intercept, the measurement disturbs the quantum states, revealing the intrusion.

Quantum Communication via Satellites:

Due to limitations in fiber optics, satellites are being used for long-distance quantum communication. China's Micius Satellite demonstrated successful satellite-based QKD over thousands of kilometers.

Applications:

- Secure Government & Military Communication
- Banking and Finance Sector
- Future Quantum Internet
- Global QKD Networks

Challenges:

- Quantum Decoherence: Quantum states are fragile and can collapse easily.
- Technological Complexity: Requires highly sensitive and precise equipment.
- Scalability: Global quantum networks are still under development.

Conclusion

Both Satellite and Quantum Communication represent critical advances in the field of Electronics and Telecommunication Engineering. While satellite systems are already integral to daily life, quantum communication promises an unprecedented level of security for the future. Together, these technologies are shaping a more connected and secure world.

Mr. Prabhakar Rath

(Asst.Prof. ETC)

We are Spark

We're the spark, we're the wave, we're the signal that flies,
From the circuits on the board to the satellites in skies.
Binary hearts, oh we dream in code,
Building bridges through the air, with every line we load!

E-T-C, we rise and shine,
Transmitting thoughts across the line!
From bits to bytes, from sound to sight,
We build tomorrow, day and night!
ETC! Yeah, we're tuned to lead,
Innovation is our creed!
Electronics, telecom—our beat,
We wire the world, feel the heat!

From op-amps to RF, logic gates we tame,
Oscilloscopes and signals, it's more than just a name.
We speak in waves, we vibe in volts,
Designing systems, breaking bolts!

We dream of 6G, quantum calls,
Controlling bots and sensor halls,
IoT, AI, and SDR,
We're not just students—we're the stars!

E-T-C, we light the flame,
In every lab, they know our name!
From baseband tones to fiber lights,
We're changing days, electrifying nights!
ETC! Forever proud,
Let's chant our code out loud!
In every wire, in every stream,
ETC – we live the dream!

Mrs. Suchismita Satapathy
(HOD ETC)

"Quantum Code"

No clone can copy what we send,
Our quantum bits just don't pretend.
Entangled hearts across the night,
Encrypted love in purest light.

QKD is how we roll,
Crack-proof secrets, that's our goal.
If you spy, we'll surely know—
Quantum's got that stealthy glow!

Mrs. Julli Das

"Signal in the Sky"

We launch a dream up into space,
Round the Earth it finds its place.

GEO, LEO, MEO too,
Carrying voice and video through.

Uplink strong, downlink clear,
We bring the cosmos really near.

From GPS to Starlink high,
It's a signal in the sky!

Mrs. Bhagabati Jena

6G Communication Technology

Overview:

While 5G is still rolling out globally, research and development on **6G (Sixth Generation)** wireless technology is already underway. It aims to offer **terabit-level data rates**, ultra-low latency (<1 ms), and support for **massive connectivity**, including **satellite-terrestrial integration**.

Key Features:

- **THz frequency bands** for extremely high-speed communication
- AI-powered network optimization and dynamic resource allocation
- Integration with **quantum communication** for security
- Use of **reconfigurable intelligent surfaces (RIS)** to control signal propagation

Applications:

- Real-time **holographic communication**
- **Autonomous vehicle-to-everything (V2X)** communication

Seeta Sabar

Student ETC

Reconfigurable Intelligent Surfaces (RIS)

Overview:

RIS are **artificial surfaces** composed of many small elements that can **control electromagnetic waves** in real-time. They are used in modern communication systems to **redirect, amplify, or block signals** to improve signal quality and energy efficiency.

Key Features:

- Works passively or semi-passively
- No need for active power-consuming components
- Can be controlled via software (software-defined radio integration)
- Enhances signal coverage in **non-line-of-sight (NLOS)** conditions

Applications:

- Smart indoor wireless environments
- Signal enhancement for **urban 6G networks**
- Wireless power transfer systems

Debasmita Nayak

Student ETC

सी.वी. रमन पॉलिटेक्निक की शान

वो सुबह की पहली घंटी की आवाज़,
जैसे हो नई उम्मीदों की आगाज़।
सी.वी. रमन की ये प्यारी ज़मीं,
जहाँ सपनों को मिलती है नई दिशा कहीं।

शिक्षक हैं जैसे दीपक की लौ,
ज्ञान की बातों से भरते हैं बौ।
प्रयोगशालाएं, क्लासरूम, और मैदान,
हर कोना है यहाँ एक ज्ञान का स्थान।

दोस्ती, मस्ती, और मेहनत का मेल,
हर दिन यहाँ बनता है एक नया रेल।
इम्तिहान हो या प्रोजेक्ट की रात,
हमेशा साथ निभाते हैं दोस्त हर बात।

फेस्टिवल्स में रंगों की बौछार,
खुशियों से भरता है हर एक त्योहार।
हर कदम पर प्रेरणा की बात,
सी.वी. रमन देता है जीवन को साथ।

जब जाएंगे हम इस आँगन से दूर,
याद आएंगे ये पल, ये हर एक सुर।
कभी ना भूलेगा ये प्यारा जहान,
हमेशा रहेगा दिल में **सी.वी. रमन** का नाम।

Sruti Sawani Debata
2nd Year ETC

ज़िंदगी और दोस्ती

ज़िंदगी एक राह है, कांटों भरी सही,
हर मोड़ पर मिलती है कोई नई कहानी कहीं।
कभी हँसी, कभी आँसू, कभी खामोशी का आलम,
फिर भी चलती है ये, जैसे बहता हो सावन।

पर जब साथ हो दोस्ती की रौशनी,
तो अंधेरे भी लगते हैं जैसे चाँदनी।
एक हँसी, एक बात, और सब ग़म दूर,
दोस्ती है वो दवा, जो रखे दिल को भरपूर।

जब गिरते हैं हम, तो थामते हैं वो हाथ,
बिन कहे समझ लेते हैं दिल की हर बात।
ना कोई सौदा, ना कोई हिसाब,
सिर्फ साथ, विश्वास और बेहिसाब प्यार का ख़्वाब।

ज़िंदगी कभी आसान नहीं होती यार,
पर दोस्ती बना देती है हर मोड़ को त्यौहार।
ये रिश्ते जो दिल से जुड़ते हैं,
वही ज़िंदगी को असली मायने देते हैं।

तो चलो जिएं इस पल को खुलकर हँसते हुए,
दोस्ती के संग, हर मुश्किल को झूमते हुए।
क्योंकि आखिर में, याद वही लम्हे आते हैं,
जो दोस्तों के साथ बिताए जाते हैं।

Srinik Jha
2nd Year ETC

ବର୍ଷା ରୁଡ଼ର ଝରିଝରା ଗାନ

ଝରି ଝରି ବର୍ଷା ଝରେ, ମେଘ ଗାଏ ଗୀତ,
ଅଭିଯାନ ଆରମ୍ଭ ହେଉଛି, ପଢ଼ିବା ନୂଆ ଭିତ ।

ଲାଗି ଅଛି ମାଟିର ସୁଗନ୍ଧ, ପଥ ଭିଜା ହୋଇ ଯାଏ,
ଲ୍ୟାବ ଓ ଲେଙ୍କର ମଧ୍ୟରେ, ବର୍ଷା ରାଗ ଚାଏ ।

ବିଦ୍ୟୁତ୍ ରେ ଝଲଝଲି, କମ୍ପୁଟର ଚାଲି ଚାଲି,
କୋଡ଼ ଲାଈନ ଭିଜିଯାଏ, ହୃଦୟ ଅନୁଭବ ଖାଲି ।

ସହପାଠୀଙ୍କ ହସି, ଚାଉମିନ୍ ଓ ଚା,
ବର୍ଷା ଦିନ ହୋଇଯାଏ, ମିଠା ଅନୁଭୂତିର ପାଖା ।

ଏହି ବର୍ଷା ମନରେ ଆନେ, ନୂଆ ଆଶାର ଝଙ୍କାର,
ଏମିତି ହିଁ ଶିକ୍ଷା ଓ ସମ୍ବୃଦ୍ଧିରେ, ରହିଯାଉ ସୁନ୍ଦର ଅନୁଭାବ ।

Bismayee Praharaj
2nd Year ETC

ସେନାନୀ – ମାତୃଭୂମିର ସୁରା

ଚାଲେ ଯିଏ ସୀମା ପଥେ, ଧରି ନିଜ ମାତୃଭୂମି ନାମ,
ଜୀବନ ତାଙ୍କ ପାଇଁ ଦୁଇୟମ, ପ୍ରଥମ ହେଉଛି ଦେଶ ଧ୍ୟାନ ।

ଘରର ଚଉକ ଛାଡ଼ି, ଜୟ ହିନ୍ଦ ନିଆରା ସଙ୍କଳ୍ପ,
ତାଙ୍କ ହୃଦୟ ଅଭୟ ବାସ, ଅଛି ତା'ରେ ବିର ଉତ୍ସାହ ଆକଳ୍ପ ।

ଶୀତ ବା ବର୍ଷା, କିମ୍ବା ଗରମ ଝୁଲା,
ସେନାନୀ ଅବିଚଳ ରହେ, ଦେଶ ପାଇଁ ଯୁଦ୍ଧର ତୁଳା ।

ଗୋଳି ଚାଲିଥିବା ମାର୍ଗ ମଧ୍ୟରେ, ହସି ଦିଏ ନିଜ ନାମ,
କାହାକୁ ଦେଖାଇ ଦେଉଛି, କଣ ହୁଏ ସତ୍ୟ ବିର ସ୍ନେହର କାମ ।

ଶହିଦ ହେଲେ ମଧ୍ୟ, ତାଙ୍କ ଗାଥା ଅମର ଥାଏ,
ତାଙ୍କ ରକ୍ତ ରେ ଲେଖାଯାଏ, ଜନନୀ ଭାରତ ର ଅମିଟ ଛାଏ ।

ମୁଁ କୁହେ – ସେନାନୀ ନୁହେଁ ମାତ୍ର ନାୟକ,
ସେ ହେଉଛନ୍ତି ଦେଶର ଗର୍ବ, ଦିଗନ୍ତରେ ଜ୍ୱାଳିଥିବା ଦୀପକ ।

Archita Bishoyee
2nd Year ETC

Terahertz (THz) Imaging and Communication

Overview:

Terahertz waves (0.1–10 THz) sit between microwave and infrared on the EM spectrum. THz technology is gaining momentum for its **high-resolution imaging** and **ultra-fast data transfer**.

Key Features:

- Non-ionizing and safe for human tissues
- Can penetrate materials like plastic, fabric, and cardboard
- THz antennas and transceivers are now being miniaturized for integration into **IoT and mobile devices**

Applications:

- **Security scanning systems** (airport body scanners)
- **Biomedical imaging** (early cancer detection)
- Ultra-broadband communication for **6G networks**

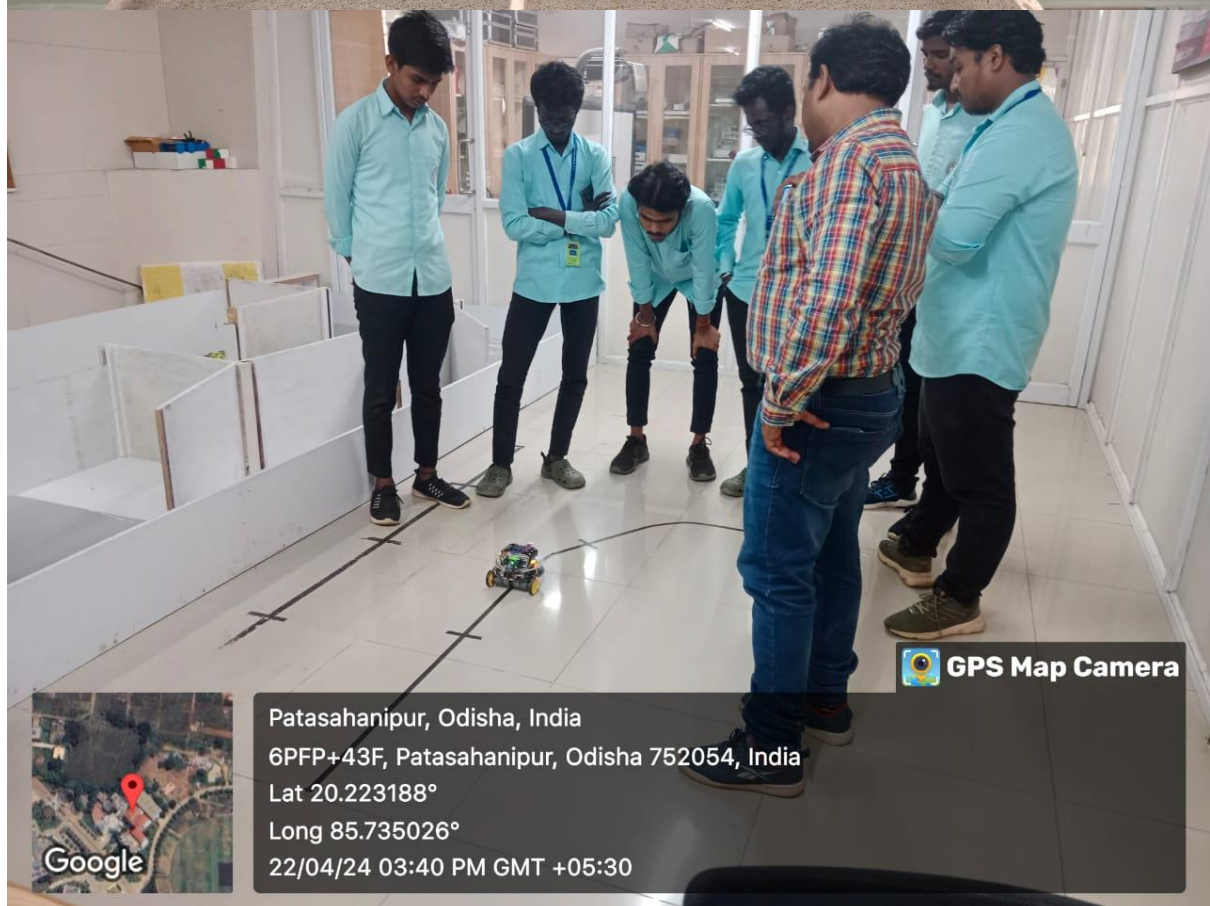
Suraj Kumar

Student ETC

PHOTO GALLERY



















DIGITAL EARTH STATION
DSX, BHARANGPUR
SATELLITE - ~~ISATRON~~ (C-04) MODE : MCPC
UPLINK PARAMETERS:
FREQUENCY : 5216.50 MHz, POL : V, FEC : 3/4
SYMBOL RATE : 6.25 MSPS
DOWNLINK PARAMETERS:
FREQUENCY : 3804.50 MHz, POL : H, FEC : 3/4
SYMBOL RATE : 6.25 MSPS







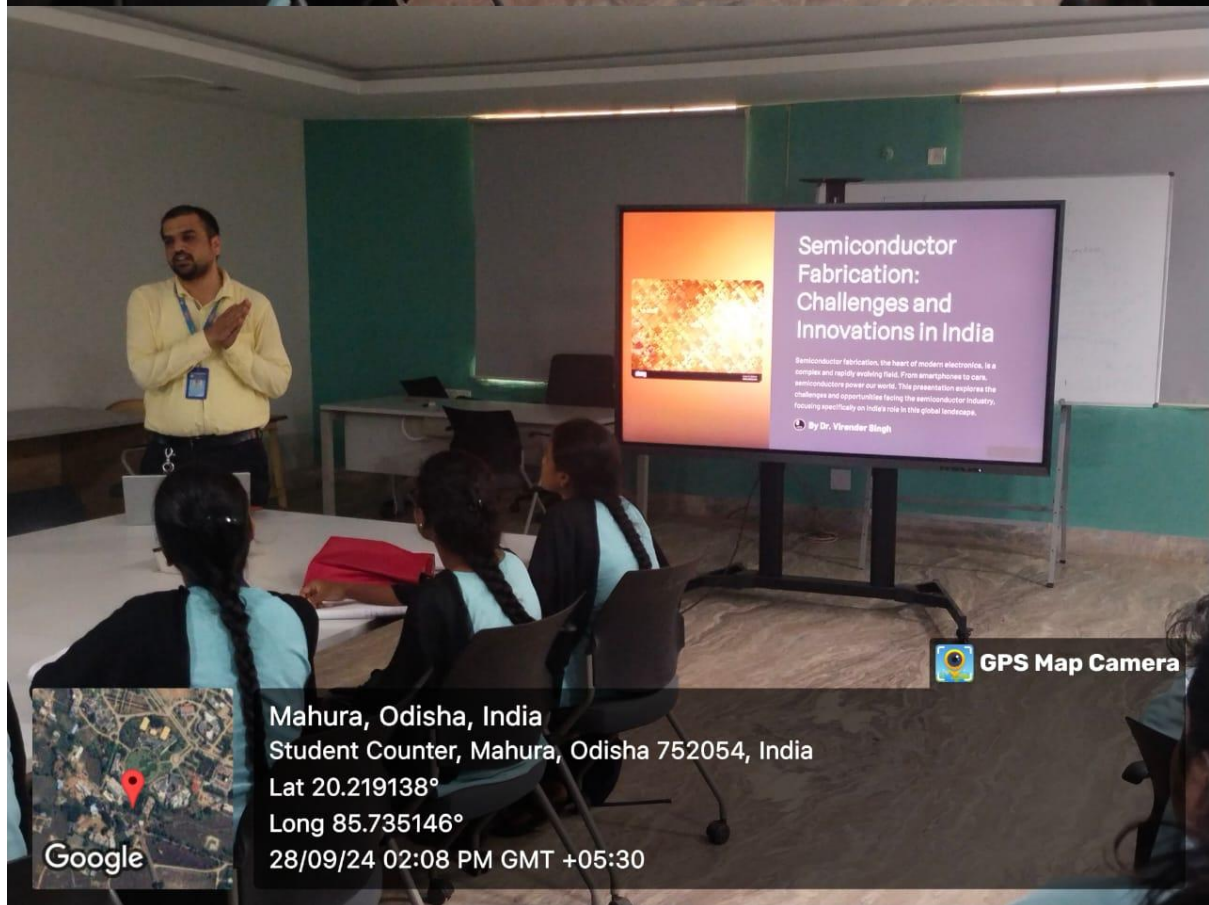
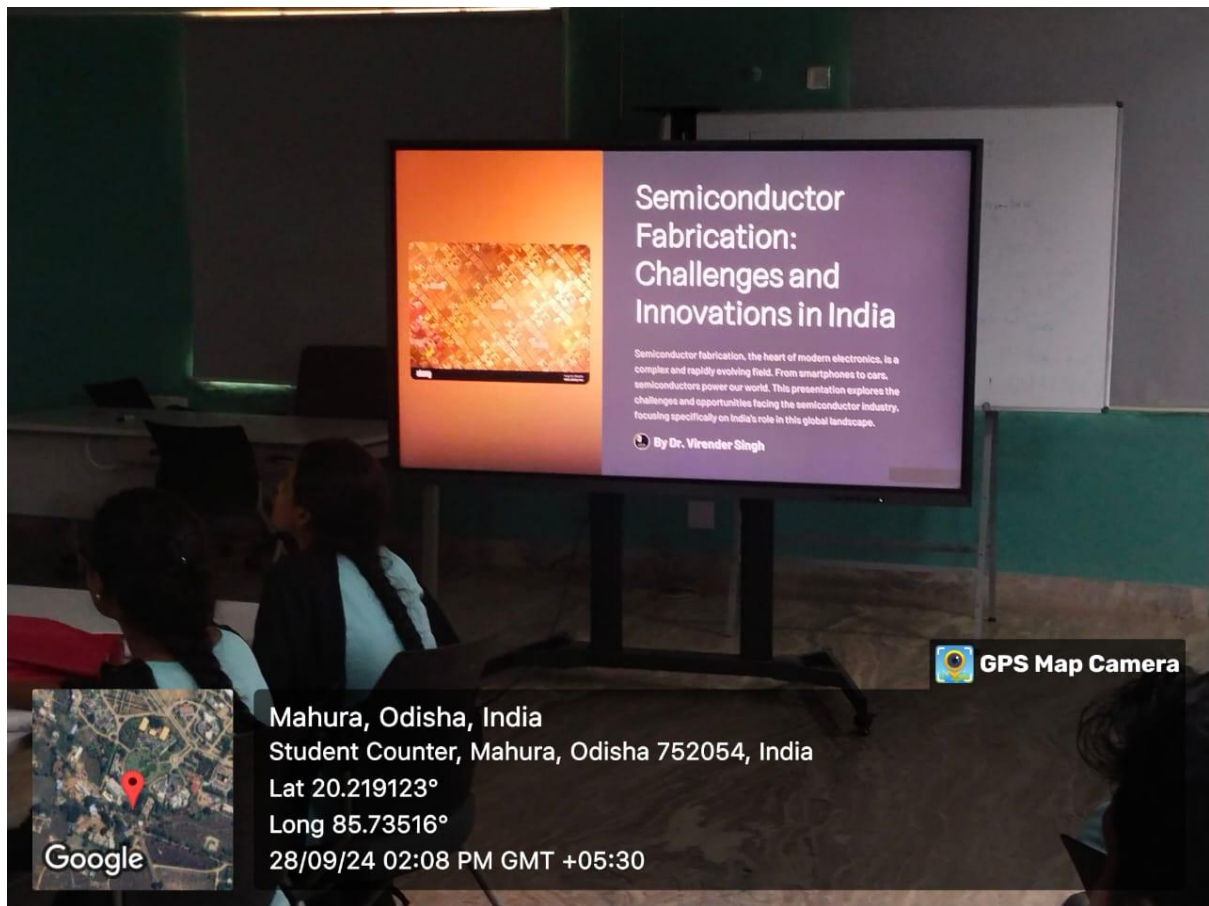
Diploma Department, Patasahanipur, Odisha 752054, India

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20.2230022 N

Longitude
85.734816 E

Local 04:07:10 PM
GMT 10:37:10 AM

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Tuesday ,24/09/2024











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Lat 20.22044° Long 85.736858°
16/12/24 01:58 PM GMT +05:30







CONCLUSION

Let us continue to push the boundaries of innovation, collaborate across disciplines, and harness the power of technology to build a smarter, more sustainable world. As electrical engineers, our role extends beyond designing and implementing systems—we are shaping the future of energy, automation, and intelligent solutions. By embracing emerging technologies, investing in research, and fostering a culture of continuous learning, we empower the next generation to drive meaningful change. Together, we can inspire future engineers, develop ground breaking solutions, and electrify the future with ingenuity, resilience, and a commitment to excellence.