



# PRERNA 2024

## 2023 - 24

<b>VISION</b>	<b>To develop technically Skilled Electrical Engineers contributing to sustainable development and technological advancement.</b>
<b>MISSION</b>	<p><b>M1: To implement an effective teaching-learning process to develop skilled electrical engineers.</b></p> <p><b>M2: To provide technical and entrepreneurial skills to students and make them ready to be placed in industry.</b></p> <p><b>M3: Encouraging the students to pursue higher education and career-oriented courses.</b></p> <p><b>M4: Developing ethics in students as well as responsibility towards environment and the society</b></p>

<p><b>PO</b></p>	<ul style="list-style-type: none"> <li>• <b>Basic and discipline specific knowledge.</b></li> <li>• <b>Problem analysis</b></li> <li>• <b>Design/development of solutions</b></li> <li>• <b>Engineering tools, experimentation and testing</b></li> <li>• <b>Engineering Practices for society, sustainability and environment</b></li> <li>• <b>Project Management</b></li> <li>• <b>Lifelong Learning</b></li> </ul>
<p><b>PEO</b></p>	<p><b>PEO1:</b> To learn the fundamentals of electrical engineering in order to study and analyze electrical systems.</p> <p><b>PEO2:</b> To use analytical and critical thinking abilities to recognize and resolve problems in electrical engineering.</p> <p><b>PEO3:</b> To demonstrate proficiency in laboratory practices, ensuring safe and effective use of electrical equipment and tools.</p> <p><b>PEO4:</b> To understand the ethical implications of engineering decisions and act with professionalism in all aspects of their work.</p>
<p><b>PSO</b></p>	<p><b>PSO1:</b> Ability to apply electrical engineering knowledge, skills for testing, control &amp; maintenance of electrical systems such as Machines, Power Systems, Drives &amp; Automation.</p> <p><b>PSO2:</b> Ability to identify problems in the diversified areas of Electrical Engineering and determine the hardware or software solutions to support the Societal, Environmental &amp; Industrial needs.</p>



**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.**



**Dr. Guda Sridevi**  
**Principal of C.V. Raman**  
**Polytechnic**

**C.V. Raman Polytechnic, Bhubaneswar, established in 2005, aims to be a global leader in technical education, collaborating with top institutions and industries. Focused on innovation and skill development, it strives to produce world-class professionals equipped with technical expertise and life skills. With advanced training facilities and industry-aligned curricula, the institute prepares students to be job-ready, world-ready, and future-ready, contributing to society's progress.**



**Mr. Subhankar Dash**  
**Hod of Electrical Engineering**  
**CVRP**

**The Electrical Engineering Department at CV RAMAN POLYTECHNIC is committed to shaping skilled and confident diploma engineers through hands-on industrial training and cutting-edge projects. With a strong focus on practical learning and industry exposure, we empower students to excel in their careers and contribute to technological advancements. Join us in building a brighter future through innovation and engineering excellence!**



**EDITORIAL BOARD**

*SUBHANKAR DASH,  
PALLAVI MISHRA,  
NABDEEP PATRA,  
AUBHAGYA RANJAN  
BEHERA*

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## The Power of Electricity

*Flowing through wires, unseen yet bright,  
Bringing warmth, bringing light.  
Powering homes, machines, and dreams,  
A silent force, or so it seems.*

*Harness it wisely, make it clean,  
Sustainability should be our dream.  
From solar to wind, let's innovate,  
A future of power, let's create!*

**BARSA DA**

## Advanced Electrical Technologies Shaping the Future

Electrical Engineering is evolving rapidly with several cutting-edge technologies. Some of the latest advancements include:

- **Wireless Power Transmission:** Innovations in wireless charging technology are paving the way for wire-free energy distribution, making electric vehicle charging and consumer electronics more convenient.
- **Artificial Intelligence in Power Systems:** AI-powered predictive maintenance, fault detection, and energy management systems are optimizing power grid operations and enhancing efficiency.
- **Flexible Electronics:** The development of flexible and wearable electronic devices is revolutionizing medical monitoring, industrial sensors, and consumer electronics.
- **Superconductors:** Advances in superconducting materials are improving the efficiency of power grids, electric motors, and magnetic energy storage.
- **Quantum Computing in Electrical Systems:** Quantum algorithms are being explored for solving complex electrical engineering problems, from optimization in power networks to improving signal processing techniques.
- **Internet of Energy (IoE):** The IoE connects power generation, storage, and consumption devices, enabling real-time energy management and efficiency improvements.

**Mrs. PALLAVI MISHRA**

**(ASST.PROF. EE)**



# Smart Grids: The Future of Intelligent Power Distribution

Smart grids are revolutionizing the way electricity is generated, transmitted, and consumed by integrating digital communication technology with electrical networks. These advanced systems enhance efficiency, reliability, and sustainability in power distribution.

## Key Features of Smart Grids:

1. **Two-Way Communication:** Unlike traditional grids, smart grids allow real-time communication between consumers and power providers, optimizing energy usage.
2. **Self-Healing Networks:** Smart grids can detect faults, isolate affected areas, and restore power automatically, minimizing downtime.
3. **Advanced Metering Infrastructure (AMI):** Smart meters provide real-time data on electricity usage, helping consumers manage their consumption effectively.
4. **Integration with Renewable Energy:** Smart grids facilitate the seamless incorporation of solar, wind, and other renewable sources, reducing reliance on fossil fuels.
5. **Energy Storage Solutions:** Battery storage and advanced energy management systems ensure a stable and reliable power supply even when renewable generation fluctuates.
6. **Cybersecurity Measures:** As smart grids rely on digital technology, robust security mechanisms are in place to prevent cyber threats and unauthorized access.

## Benefits of Smart Grids:

- **Improved Efficiency & Reliability:** By reducing power losses, optimizing load distribution, and enabling automated maintenance, smart grids enhance overall system efficiency.
- **Sustainability & Environmental Benefits:** The integration of renewables reduces greenhouse gas emissions and promotes a cleaner energy ecosystem.
- **Cost Savings:** Consumers benefit from lower electricity bills through demand response programs, while utilities reduce operational costs with predictive maintenance.

- **Empowered Consumers:** Smart grids enable users to track energy usage in real-time, adjust consumption habits, and even sell excess electricity back to the grid.

#### Challenges in Implementing Smart Grids:

- **High Initial Investment:** The deployment of smart infrastructure requires significant financial resources.
- **Data Privacy & Security Risks:** The increased use of digital communication raises concerns about cyber threats and data privacy.
- **Integration Complexity:** Upgrading existing power networks to smart grids requires substantial technical and regulatory efforts.

Despite these challenges, smart grids are shaping the future of electrical engineering by enabling intelligent, adaptive, and sustainable power systems. Their continued evolution will play a critical role in meeting the world's growing energy demands efficiently and securely.

**Mr. Subhankar Dash**

**ASST. PROF. EE**

## The Engineer's Anthem

With wires and tools, we start the race,  
Building systems, solving space.  
Circuits, motors, volts, and amps,  
We light the way, ignite the lamps.

Innovation's in our hands,  
Creating tech that spans the lands.  
From microchips to megawatts,  
We engineer, we break the knots.

Bringing energy near and far,  
Charging up electric cars.  
Renewables, the time is right,  
Engineers, let's shine the light.

Through every wire, every spark,  
We create, we leave a mark.  
Future's bright, future's free,  
Electrical minds, we hold the key.

ADITYA KUMAR BEHERA

## The Rhythm of PLC

From the sun up in the sky,  
To the winds that pass us by,  
Energy flows, so smooth, so clean,  
A brighter world, a future green.

Wires talk, the data flows,  
Keeping track of highs and lows.  
Self-healing grids, no power loss,  
Future tech, a world to cross.

No more waste, no more fear,  
Green energy, the future's here.  
Charging cars, fueling dreams,  
Power running like laser beams.

Electric minds, electric fate,  
Smart grids lead, innovate.  
Join the wave, the time is now,  
A world so bright, we make the vow.

SUBHANKAR ACHARYA

# Energy Harvesting Systems: Powering the Future with Ambient Energy ⚡

In an era where energy efficiency and sustainability are at the forefront of technological advancements, energy harvesting systems have emerged as a revolutionary approach to powering small devices. These systems capture and convert ambient energy from the environment into usable electrical power, reducing reliance on batteries and external power sources.

## What is Energy Harvesting?

Energy harvesting, also known as energy scavenging, is the process of collecting small amounts of energy from natural sources such as:

- Solar Energy – Captured using photovoltaic cells.
- Vibrations & Mechanical Energy – Converted through piezoelectric or electromechanical systems.
- Thermal Energy – Utilized through thermoelectric generators.
- Radio Frequency (RF) Energy – Collected from wireless signals and electromagnetic waves.

These methods enable low-power electronic devices to function without traditional batteries, making energy harvesting a game-changer in IoT, wearables, and remote sensing applications.

## How Energy Harvesting Works

The basic components of an energy harvesting system include:

1. Energy Source: The ambient energy present in the environment.
2. Transducer: Converts energy from one form to electricity (e.g., solar panels, piezoelectric materials, RF antennas).
3. Power Management Circuit: Regulates and conditions the harvested energy for storage and usage.
4. Energy Storage Unit: Stores excess energy in capacitors or rechargeable batteries for later use.

For example, piezoelectric materials convert mechanical stress from walking or vibrations into an electrical charge, while thermoelectric generators use temperature differences to generate power.

## Applications of Energy Harvesting

Energy harvesting is widely used in various fields, including:

### 1. Internet of Things (IoT) and Smart Sensors

- Wireless sensors in smart cities use energy harvesting to monitor air quality, traffic, and infrastructure health.
- IoT devices in industrial automation run on energy harvested from vibrations or thermal energy.

### 2. Wearable Electronics & Medical Devices

- Smartwatches and fitness trackers can be powered by body heat and movement.
- Pacemakers and implantable medical devices use bio-energy harvesting to operate without battery replacements.

### 3. Remote & Space Applications

- Satellites use solar energy harvesting to function for extended periods.
- Sensors in remote areas collect data without requiring maintenance, reducing operational costs.

### 4. Wireless Charging & RF Energy Harvesting

- Devices can extract energy from radio waves (Wi-Fi, cellular signals) to power low-energy electronics.
- Smart homes use wireless energy harvesting for battery-free remote controls and sensors.

## Advantages of Energy Harvesting

- ✓ Sustainable & Eco-Friendly – Reduces dependency on disposable batteries.
- ✓ Low Maintenance – Harvested energy enables long-term operation without frequent replacements.
- ✓ Cost-Effective – Lowers operational expenses in remote and industrial applications.
- ✓ Compact & Efficient – Small devices can function autonomously in any environment.

## Challenges & Future Prospects

- ◆ Low Power Output – Current energy harvesting technologies generate only small amounts of power, limiting their applications.
- ◆ Energy Storage Limitations – Efficient storage solutions are required to maximize the usability of harvested energy.
- ◆ Scalability Issues – Developing large-scale energy harvesting solutions for industrial applications remains a challenge.

Despite these hurdles, advancements in nanotechnology, material science, and AI-driven energy management systems are making energy harvesting more efficient and viable for future applications.

## Conclusion


Energy harvesting systems are revolutionizing the way we generate and use power in everyday life. As technology evolves, these systems will become a mainstream power solution for IoT, medical devices, and smart electronics, leading to a more sustainable and energy-efficient world.

DEBI PRASAD MOHANTY

# SEMINARS AND INDUSTRIAL VISIT





## SEMINAR ON POWER SYSTEM PROTECTION

**CV RAMAN POLYTECHNIC, BHUBANESWAR**



**DEPARTMENT OF ELECTRICAL ENGINEERING**  
**WELCOME TO THE SEMINAR ON**  
**'POWER SYSTEM PROTECTION'**

**DATE: 14.05.2024**  
**TIME: 10.30 A.M**  
**VENUE: BOSCH AUDITORIUM, CGU ODISHA**

<b>HONORABLE SPEAKER</b>	<b>PATRON</b>	<b>CONVENOR</b>	<b>ASST. CONVENOR</b>
			
<b>PROF. DR. ASHWIN KUMAR SAHOO</b> DEAN ACADEMICS, CGU	<b>ER.R.K PRUSTY</b> PRINCIPAL CVRP	<b>MR.SUBHANKAR DASH</b> HOD , EE, CVRP	<b>MRS. PALLAVI MISHRA</b> ASST. PROF, EE,CVRP









## SEMINAR ON LOAD FREQUENCY CONTROL OF POWER SYSTEM

**CV RAMAN POLYTECHNIC, BHUBANESWAR**

**DEPARTMENT OF ELECTRICAL ENGINEERING**  
WELCOME TO THE SEMINAR ON

**'LOAD FREQUENCY CONTROL OF POWER SYSTEM'**

DATE: 01.10.2024  
TIME: 10.30 A.M  
VENUE: CV RAMAN POLYTECHNIC ODISHA

CHIEF SPEAKER	PATRON	CONVENOR	ASST. CONVENOR
			
PROF. DR. KARTIK CHADRA PATRA DIRECTOR, CGU	ER.R.K PRUSTY PRINCIPAL CVRP	MR.SUBHANKAR DASH HOD, EE, CVRP	MRS. PALLAVI MISHRA ASST. PROF, EE,CVRP



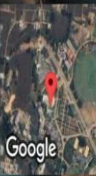
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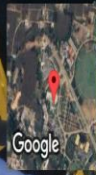
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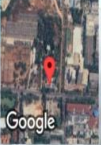
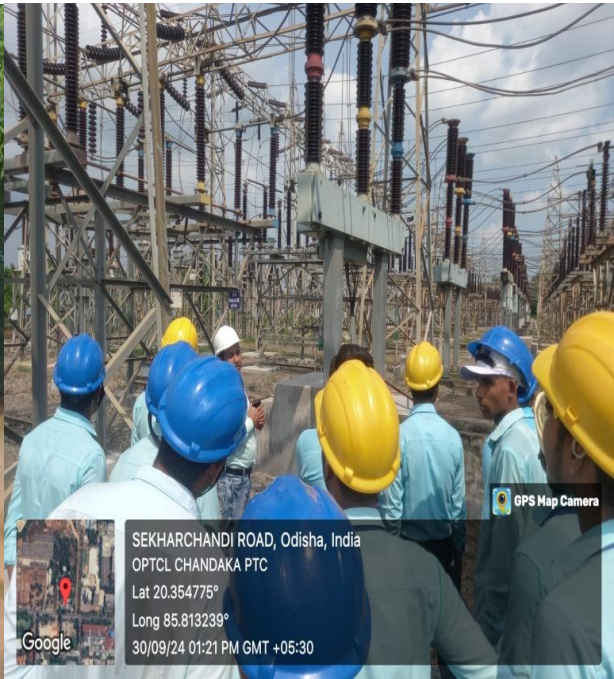
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# INDUSTRIAL VISIT OF ELECTRICAL DEPARTMENT





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GPS Map Camera



GPS Map Camera



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Shot on OnePlus  
Powered by India Camera

# COE VISIT



# PHOTO GALLERY

## *Various events in the Department*







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6PFP+9VX, Patasahanipur, Odisha 752054, India

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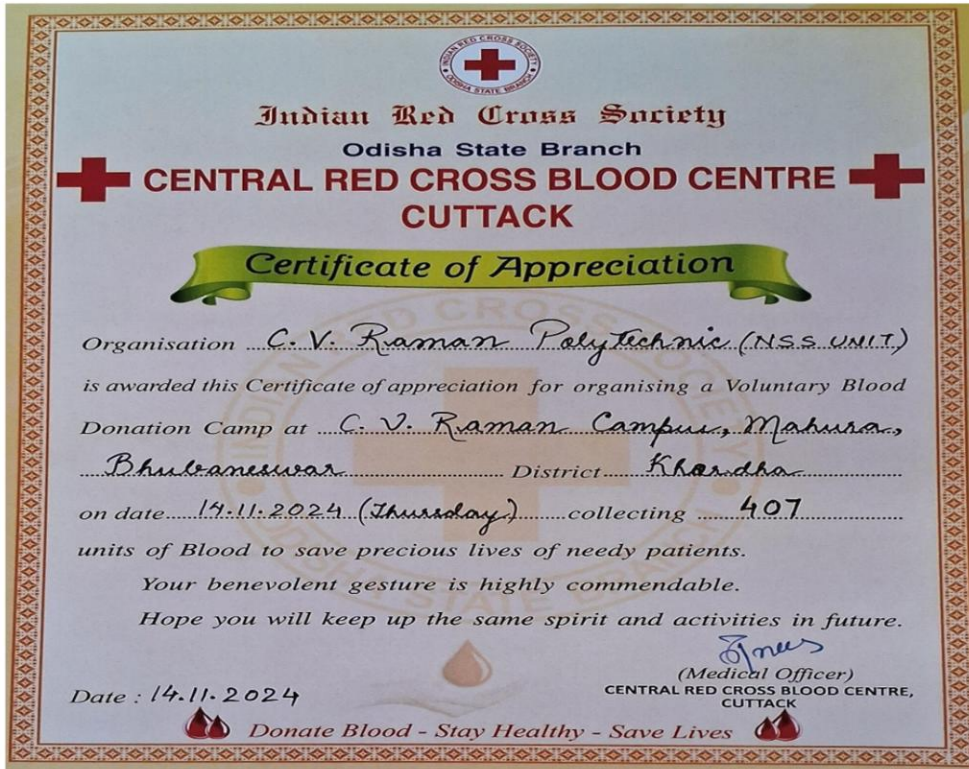
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## CONCLUSION

As we embrace rapid advancements in Electrical Engineering, we step into a future powered by innovation and sustainability. From smart grids to renewable energy, from electric vehicles to artificial intelligence, the role of electrical engineers is more vital than ever. Our commitment to excellence, research, and industry collaboration ensures we stay at the forefront of technological progress. By fostering curiosity, creativity, and technical expertise, we prepare the next generation of engineers to shape a smarter, more connected world. Let us continue to explore, innovate, and electrify the future together.