GPCET
Pioneering Innovative Education

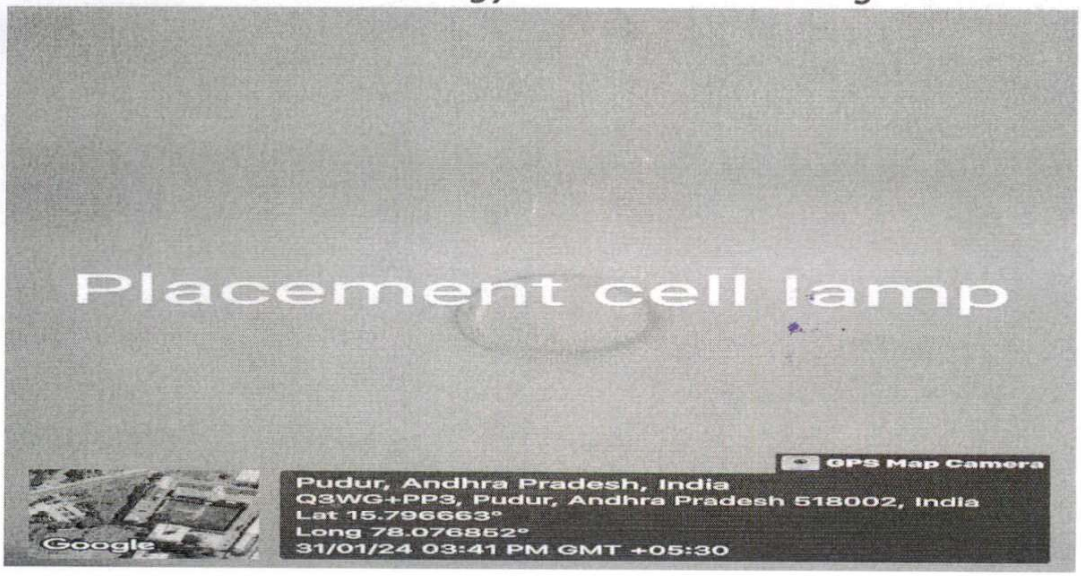
G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous)

(Approved by AICTE | NAAC Accreditation with 'A' Grade |
Accredited by NBA (CIV, CSE, ECE & EEE) | Affiliated to JNTUA)
Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

BLOCK 1 SOLAR SYSTEM

Sensor based energy conservation LED lights



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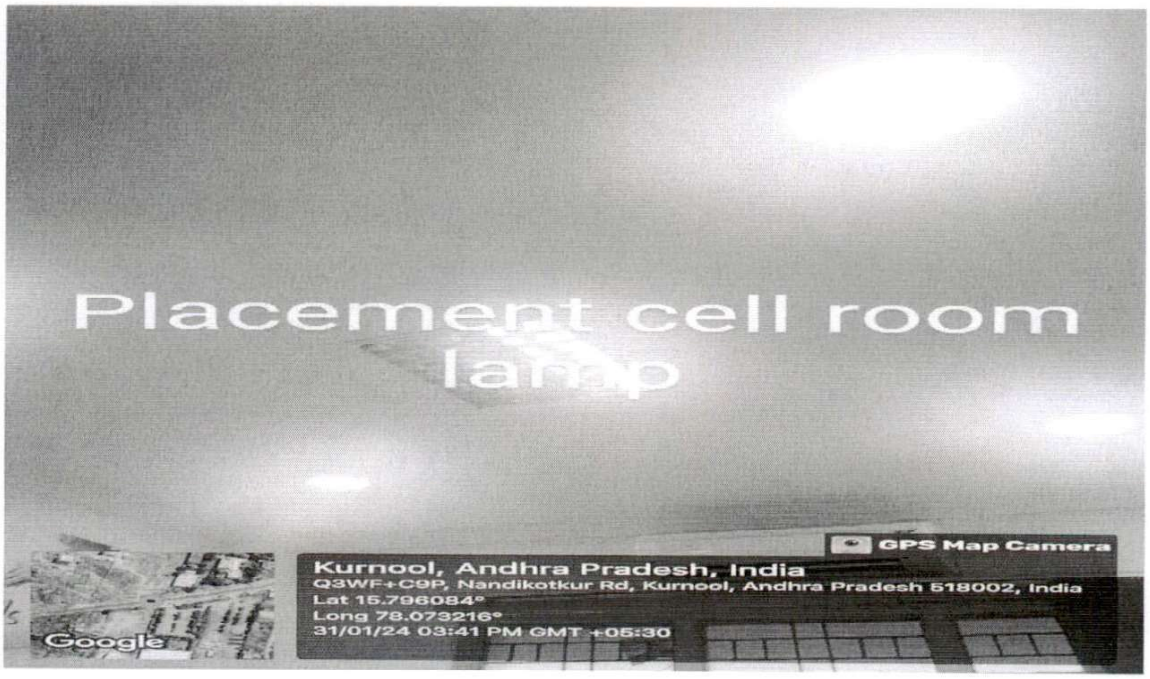

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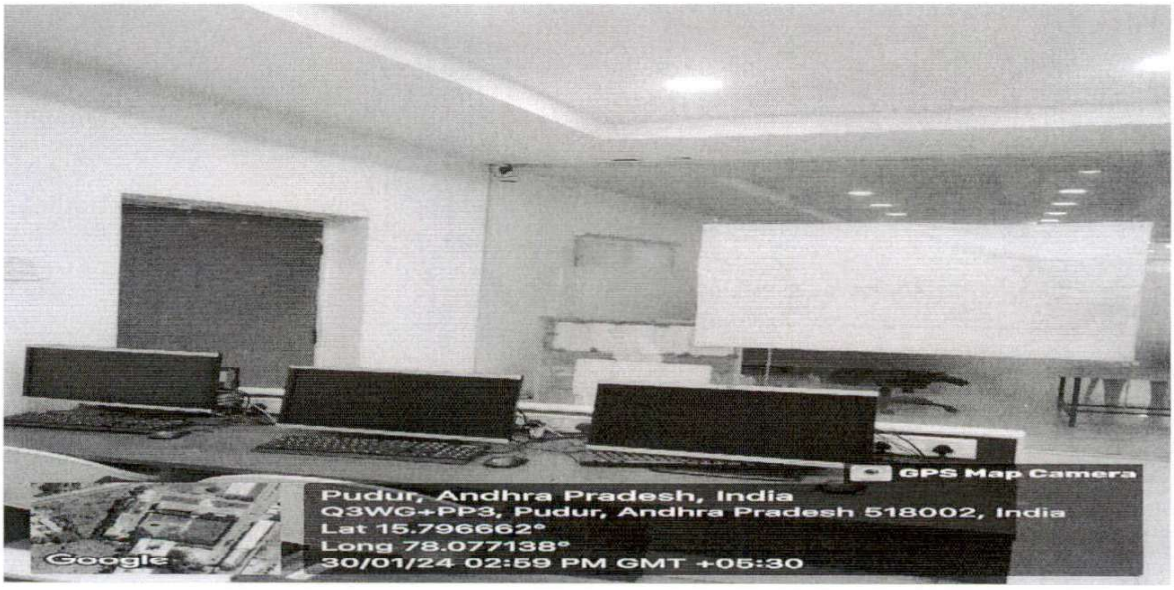

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LED lights:

LED lights offer a distinct environmental advantage over compact fluorescent (CFL) lights. CFLs contain traces of mercury, which can be harmful to the environment in cumulative amounts. Additionally, CFLs are not RoHS compliant and often need to be disposed of as hazardous substances in many countries. On the other hand, LEDs contain no mercury or any other hazardous material and can be safely discarded in regular trash or recycled after use.

The environmental impact extends to electricity consumption and carbon dioxide (CO2) emissions. LED lights use approximately half the energy of CFLs, resulting in a 50% reduction in CO2 emissions associated with their use. Furthermore, LEDs consume less power and have a longer lifespan. Traditional 60W incandescent bulbs are becoming obsolete, and even CFLs may soon follow suit. A 6W LED light can produce around 806 lumens, equivalent to the light intensity of a 60W incandescent or a 15W fluorescent bulb. Notably, LED lights operate on a lower voltage (3-12VDC) and have a maximum power consumption of just 6W.

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ENERGY MANAGEMENT POLICY

Energy plays a crucial role in both national and organizational development, with energy requirements closely linked to GDP growth. Among various costs, energy cost stands out as a significant factor. Energy intensity, defined as energy requirement per GDP, serves as a key indicator of a country's development stage and the efficiency of its energy use. Unfortunately, our country faces challenges in energy security, relying heavily on coal and petroleum product imports for about 70% of its energy needs, predominantly through thermal power plants.

The energy intensity of our country is notably high, being 3.7 times that of Japan, 1.55 times that of the USA, 1.47 times that of Asia, and 1.5 times the world average. This high energy intensity not only affects economic sustainability but also contributes to environmental pollution due to the use of fossil fuels.

To address these issues, the Energy Conservation Act of 2001 was enacted, aiming to improve energy efficiency and reduce energy intensity for sustainable development. Energy management becomes essential for judicious and effective energy use without compromising requirements, maximizing profits, and minimizing environmental degradation. Implementing energy management programs across all economic sectors holds substantial potential for energy conservation.

Creating awareness about energy conservation at all levels is crucial to engage stakeholders effectively. Engineering colleges can play a pivotal role in educating students and society about energy management programs, guiding industries in this realm. Energy audits, as an important tool, help identify energy conservation potential, providing a positive orientation toward energy cost reduction. These audits translate energy conservation into tangible actions, considering both technical and commercial aspects. It is imperative to emphasize energy management, environmental concerns, and ecological sustainability for a sustainable and efficient energy future.

Mission:

- Minimize energy consumption by using energy-efficient equipment, maximizing the use of daylight, natural ventilation, and energy substitution.
- Maximize the use of renewable energy.
- Create awareness about energy conservation.

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Objectives:

1. Improve energy efficiency to reduce energy consumption and cost.
2. Eliminate wastages through good housekeeping practices.
3. Minimize environmental degradation.

Energy Management Principles: Various energy management principles include:

1. Procure energy at the lowest cost.
2. Use energy at the highest possible efficiency.
3. Use low-investment technologies.
4. Reduce, reuse, and recycle.
5. Fuel substitution.
6. Use of renewable energy.

Energy Management Structure: There is an energy management center at the institute level, headed by Dr G. Pandu Ranga Reddy. Each department has representatives who are part of the energy management center. The following are the representatives of the energy management center.

Types and Use of Energy

S.No	Type of Energy	Energy usage
1	Electrical energy	▶ Indoor and outdoor illwnination ▶ Air conditioning ▶ Water Pumping. ▶ Computers and peripherals ▶ Laboratory Equipment ▶ Workshop Equipment
2	Solar energy	In addition to the raw power, solar power plant of 100kW is installed. Grid interfacing facilities are provided.

Electrical Supply System:

The electrical power to the campus is supplied through a 11 kV high-tension supply line, and the institute achieves the required voltage of 415 KVA through a 3.5 kVA step-down transformer. The 415 KVA supply is distributed to various sections of the institute via an underground cable. The underground network is adequately protected against local pressures,

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mechanical damage, and other potential hazards. The solar energy (160 KW) and electrical raw power are interfaced through a bidirectional switch. Whenever raw power is insufficient to meet the demand at the institute, the power generation from solar is uploaded to the grid daily if it exceeds the requirements.

Backup Power Supply

The institute is equipped with diesel generators as:

1. 125KVA
2. 125KVA

In addition to the backup facilities, all the departments and laboratories, ICT facilities in classrooms, common facilities are connected to UPS system. Institute having 500KVA installed UPS system for backup facility.

Plan of Achievement:

1. Efficiently utilize energy resources by adopting cleaner and more efficient technologies.
2. Provide training to faculty, students, and industry professionals to position the institute as a pace-setter in the field of energy conservation.
3. Promote awareness related to energy conservation among various sections of society.
4. Enhance our experience in energy conservation through the exchange of ideas with other organizations.
5. Encourage faculty members to obtain certification as certified energy auditors and managers.
6. Conduct regular internal energy audits to identify energy conservation opportunities.
7. Offer expertise to industry and other organizations in the field of energy management by providing energy audit services.

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