VIGNAN'S INSTITUTE OF MANAGEMENT AND TECHNOLOGY FOR WOMEN
Sponsored by Lavu Educational Society, Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad.
Kondapur (V), Ghatkesar (M), Medchal - Malkajgiri (D) - 501 301 Phone: +91 96529 10002/3

Alternate Sources of Energy & Energy Conservation Measures

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Policy on Energy conservation Measures:

Energy conservation is the practice of reducing the consumption of energy by living organisms. Energy is conserved to reduce the cost of consumption and to preserve the limited existing resources of energy. Energy can be conserved by using energy-efficient devices and other methods to consume energy and reduce the use of energy when there is no requirement. Energy can neither be created nor destroyed. It can only be transformed from one form to another. So, it is important to conserve energy.

Objectives:

- To protect and conserve ecological systems and resources within the campus.
- Organising expert lectures in the area of energy conservation
- The Institute shall continuously review and update the approved policy and is committed to its implementation
- Form a committee to monitor and check wastage of energy in the campus and Conduct Green Audit once in a year.
- To efficiently use the energy from all resources.
- To develop an energy conservation strategy for the college that is tailored to the institution's specific needs.
- To identify and implement cost-effective energy conservation measures in all areas of the college.
- To promote the use of energy-efficient technologies and renewable energy sources in the college.
- To monitor and analyse the energy consumption patterns within the college and suggest measures to reduce energy consumption.
- To promote the use of energy-saving practices and behaviours among the college community.
- To provide educational programs, workshops and seminars on energy conservation topics to the college community.
- To facilitate the implementation of energy conservation related projects within the college.

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Infrastructural Initiatives:

Renewable Sources of Energy

- **Solar Power Plant**

  Solar Power for Educational Institution is very important. The institution believes in self sustainability and energy conservation. We have switched to cleaner sources of energy like solar energy to minimize the usage of electricity in the institution produced from non renewable resources:

  1. A 50 KW Solar Power Plant has been installed on the rooftop.
  2. 6000 litters produced Solar water heaters are provided

- **Biogas Plant**

  Biogas is considered to be a renewable resource because its production-and-use cycle is continuous, and it is perfectly possible for it to be used without generating net carbon dioxide emissions to the atmosphere. To reuse the wastage from the canteen and tree litter, two 500 Litres Fisting Type Biogas Plant has been installed. The gas produced from the Big Plant is used for cooking purpose in the canteen.

Energy Saving and Energy Efficient Equipments

- **Use of LEDs**

  To minimize the use of utilization of electricity and sing cleaner sources of energy the institution is committed to install energy saving and user friendly alternatives like LED lights. of 15W, 18W, 20W and motion sensor based lights.

- The Institution uses Energy star rated appliances and sensor based equipment for the efficient use of power.

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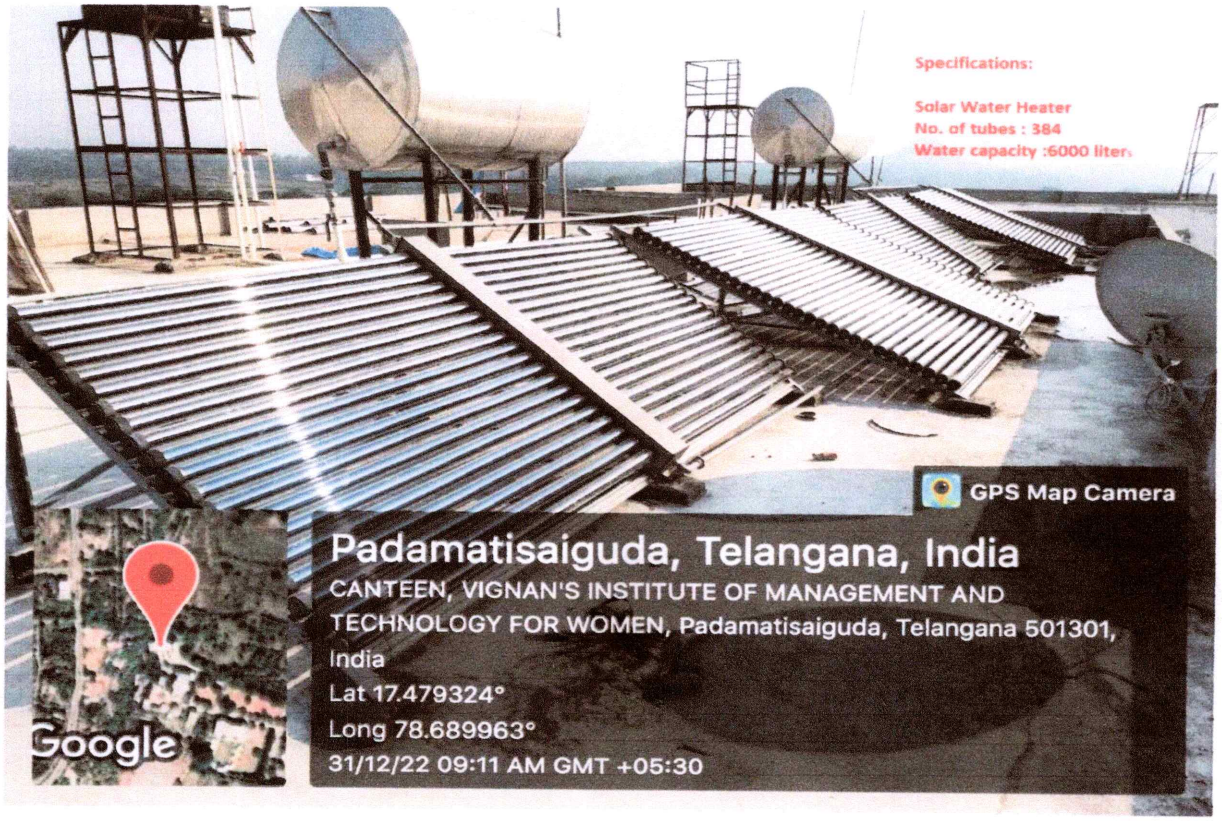
Use of Alternate Sources of Energy

Solar Power Plant

The Institute has installed a Solar Power Plant on the rooftop with a capacity of 50kW is an area of 5500 Sq. Feet and the total no of solar water heater tubes are around 384. It produces 50 kW direct current and this could produce a 6200kWh of AC per month, so this power met the electricity demand of college up to certain extent. This energy in used as power backup supply during power cuts from the electricity department and also producing 6000 liters of hot water for bathing purpose and also Solar power plant further helps in the reduction of carbon footprints.

Investing in a 50kW system will reduce the power bill but also dramatically increase the profits in the long run. 200 Units per day are generated. The institute has a solar inverter with a ring of 50kW and the inverter is a Hybrid Solar Inverter having 97% efficiency with maximum DC input of 50kW.



Solar water heater tubes producing 6000 litters of hot water

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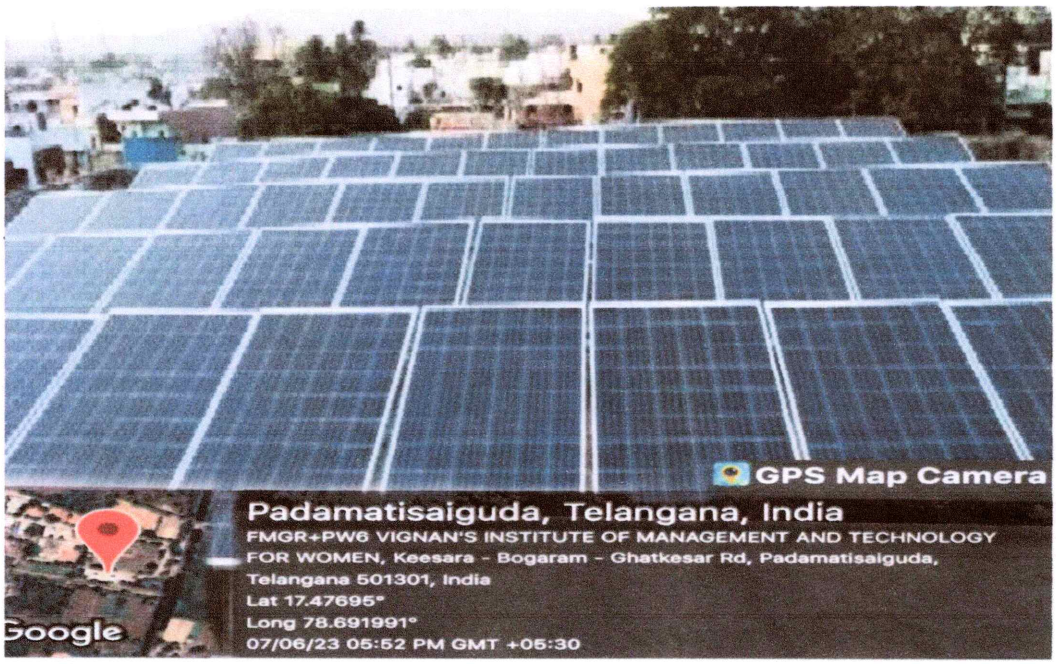

Solar Power Panel on the rooftop with a capacity of 50kW

Solar Street Lights:

- Solar-powered street light can conserve a large amount of electricity compared to the other lights which are a light to their maximum intensity at all times after they are turned on Solar Powered Led Street Light.
- By using solar panel and batteries to store and then convert solar energy to electrical this is to be used for street lighting system.
- During daytime, solar energy is stored and then depending upon natural light illumination in surrounding the array of LEDs glow using same convert solar energy. The on/off movement of LEDs depends upon input/output of sensors.
- We will be using solar panel and batteries to store and then convert solar energy to electrical which is to be used for street lighting system.

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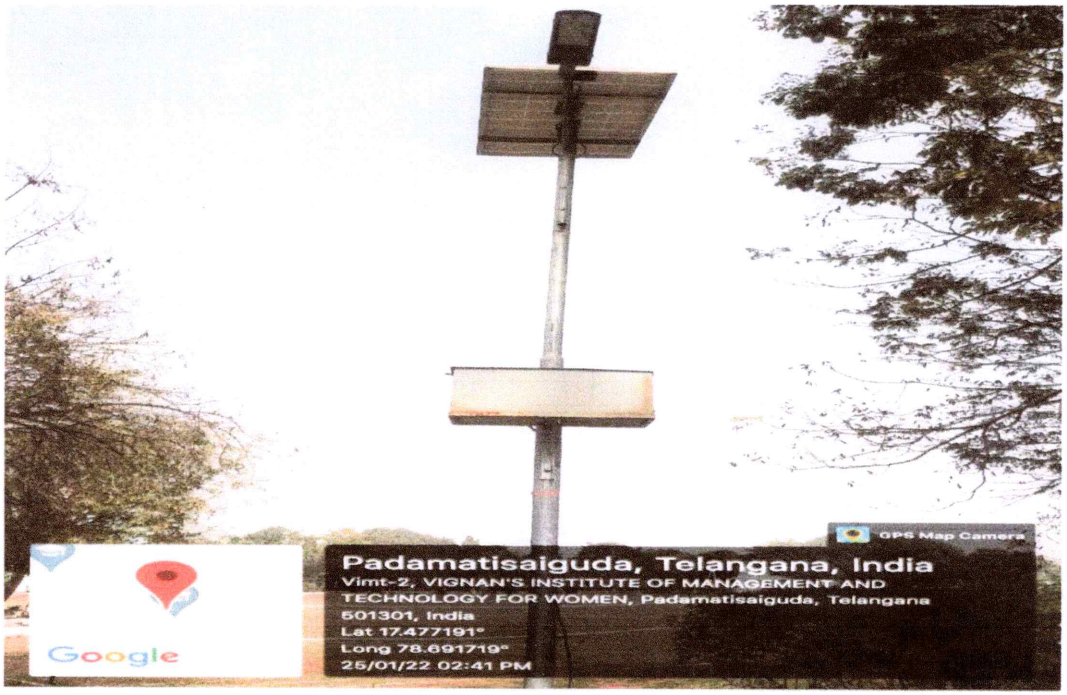

Solar Powered LED Street Light

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Use of Alternate Sources of Energy

Biogas Plant

- The continuous generation of municipal wastes and kitchen wastes has become an environmental and social concern due to the large impacts of its improper treatment and management.
- Anaerobic digestion has the advantage of Biogas production and can lead to efficient resource recovery and contribution to the conservation of non-renewable energy sources.
- Anaerobic digestion is a process that degrades these wastes in the absence of oxygen, producing Biogas that can be used to generate heat and energy.
- Producing renewable energy from our biodegradable wastes helps to tackle the energy crisis in a "greener" manner.
- Methane is a very powerful greenhouse gas: its global warming potential it 23 times higher than that of CO_2. In this way, recovering of biogas is very interesting to limit the greenhouse effect.
- Furthermore, biogas is a renewable energy form because biomass naturally releases biogas by decomposition. By using biogas as an energy source, we can reduce our dependency on fossil resources as coal, oil and natural gas.
- The proper disposal of kitchen waste will be done in an eco-friendly and cost effective way. While calculating the cost effectiveness of waste disposal we have to think more than monitory prospects only. The dumping of food in places and making the places unhygienic can be taken good care of; it adds to the value of such Biogas plants. Natural components like micro-organisms, kitchen waste & biodegradable waste viz paper, pulp can be utilized.
- The biogas produced from food waste, decomposable organic material and kitchen waste, consisting of methane and a little amount of carbon di oxide is an alternative fuel for cooking gas (LPG). Also, the waste materials can be disposed off efficiently without any odour or flies and the digested slurry from the biogas unit can be used as an organic manure in the gar
- In our college, the biogas plants are installed at the canteen which has a capacity of 500 Litters it is a portable type Biogas Plant.

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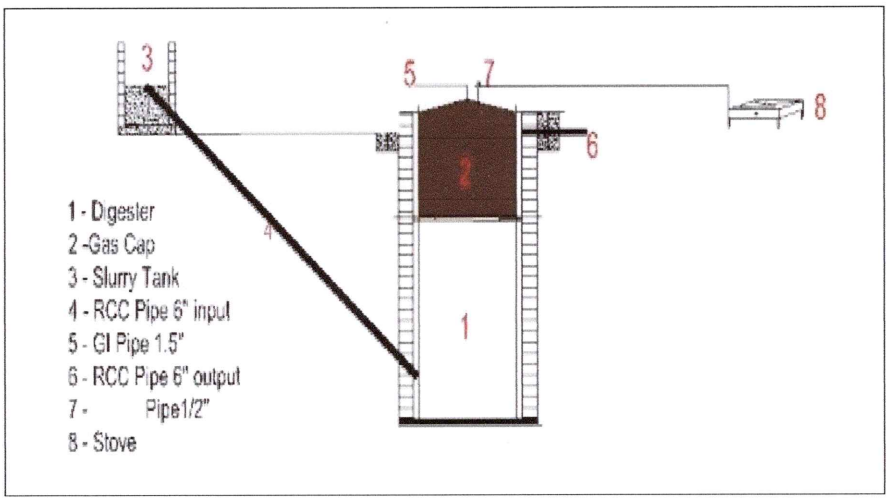
- The food waste generated in the hostel and at the canteen is collected every day and fed into the biogas plant.
- The produced biogas is utilized for cooking purpose in the canteen which can save the LPG cylinder.



Biogas Plant

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Technical Specifications of Bio-Plant:

Description/Type	Quantity/modal
Type of Model	KVIC Modal
Capacity	500 Liters
Application	Cooking
Installed Year	2023
Capacity of the biogas digester	$2M^3$ /day
Daily required food/cattle dung waste	25kg/day
Daily replacement of LPG	0.5- Kg/day
Bio-manure production per day in dry matter	6Kg.

Energy Conservation Measures:

Use of LEDs/Power Efficient Equipment

- Power crisis is one of the most common problems in India. LED is a highly energy efficient lighting technology, and has the potential to fundamentally change the future of lighting in India.
- With the help of LED, we can eliminate this shortage by minimizing the wastage of electrical power or saving our generated power.
- Light-emitting diode (LED) is one of today's most energy-efficient and rapidly developing lighting technologies. Quality LED light bulbs last longer, are more durable, and offer comparable or better light quality than other types of lighting.
- LEDs, use at least 75% less energy, and last 25 times longer, than incandescent lighting. Widespread use of LED lighting has the greatest potential impact on energy savings in the campus.
- The Institution uses fluorescent tube lights of 36W LED tube lights of 20W and Ceiling LED lights of 15W and 18W Led lights are environmental friendly and are good alterative in save energy.
- To reduce power consumption 20W tube lights are used to replace 36W which are be discarded To maintain lux levels of 240-320 in the classrooms and Laboratories, A total of 750 LED lights are being used in the institution.

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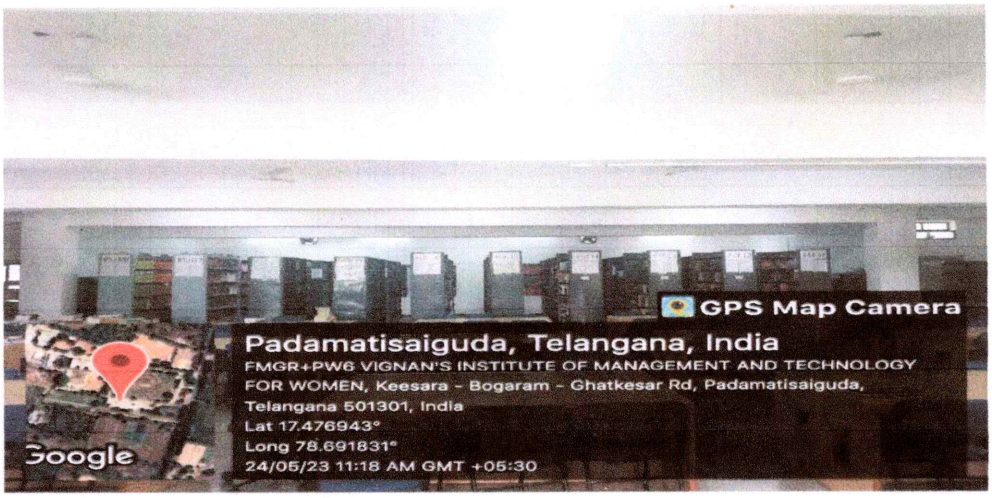
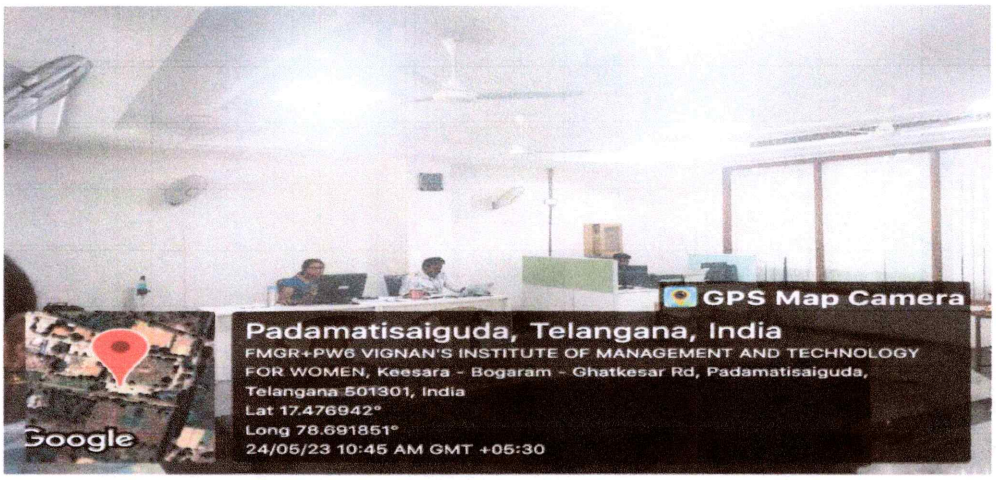


Use of LEDs in Library



Use of LEDs in Principal Front office

Use of LEDs in Corridor

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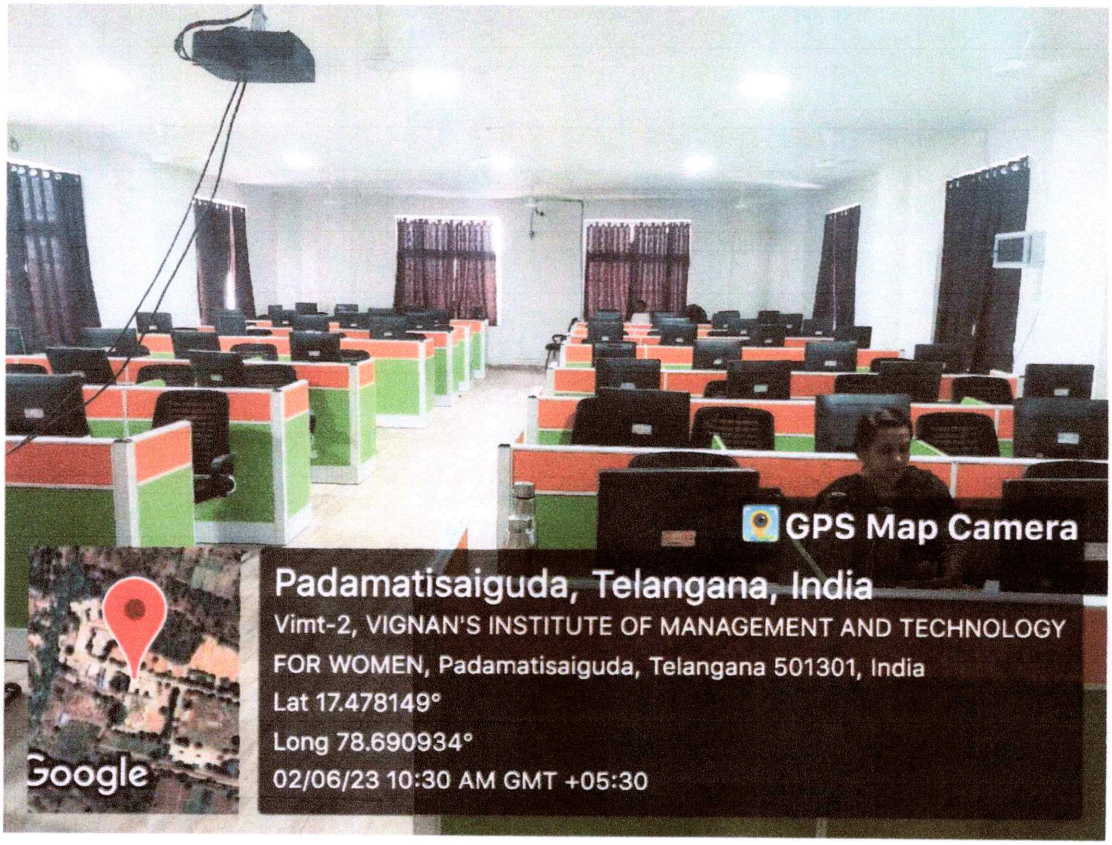

Use of LEDs in Laboratory

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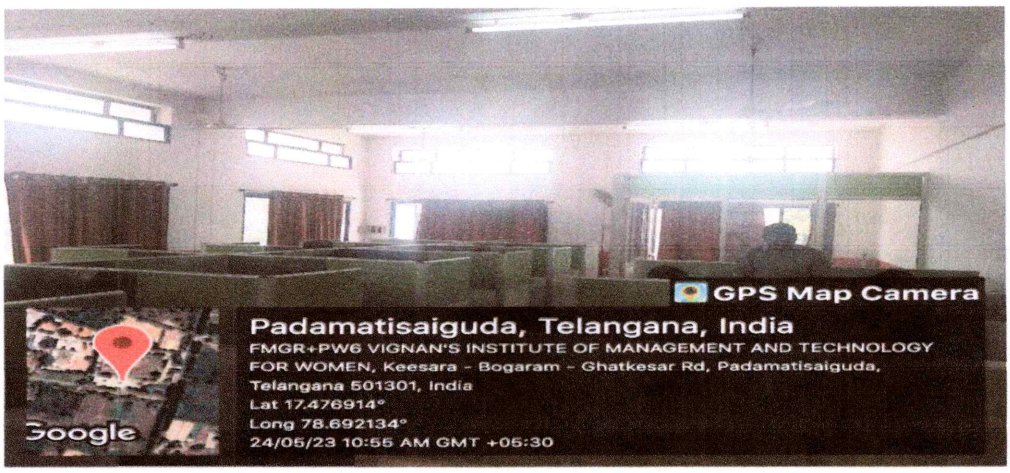
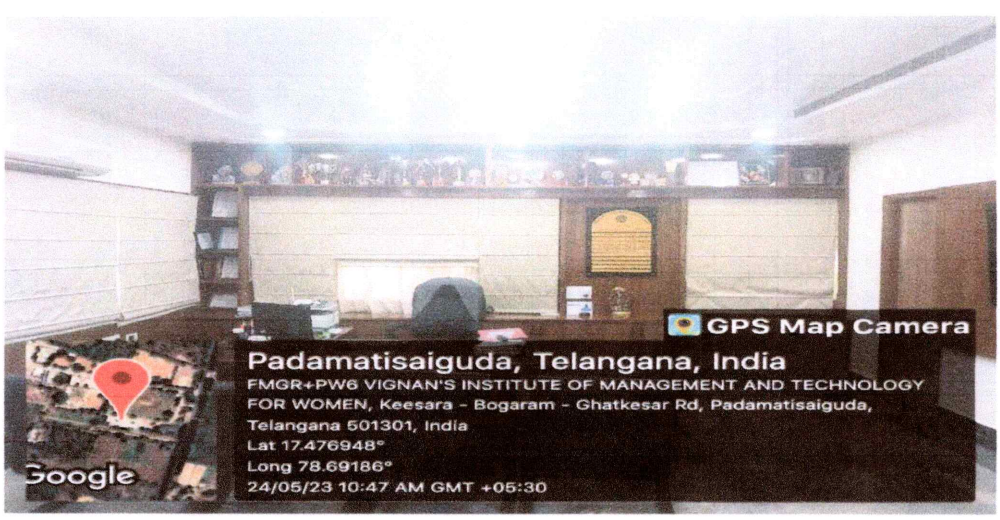
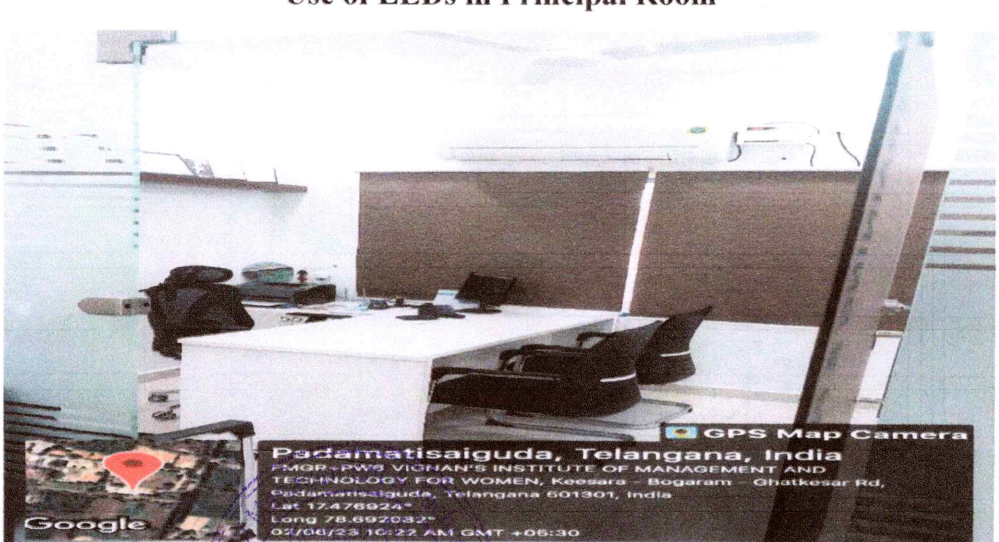


Use of LEDs in Staff Room



Use of LEDs in Principal Room



Use of LEDs in Placement officer Room

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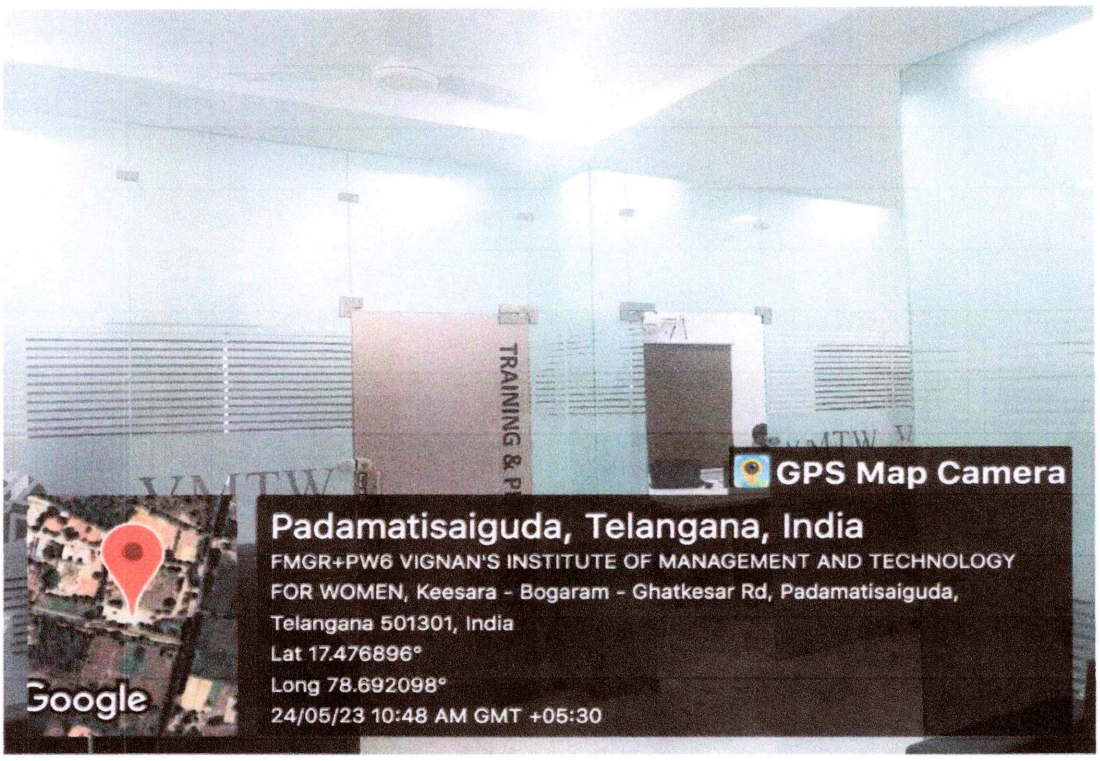
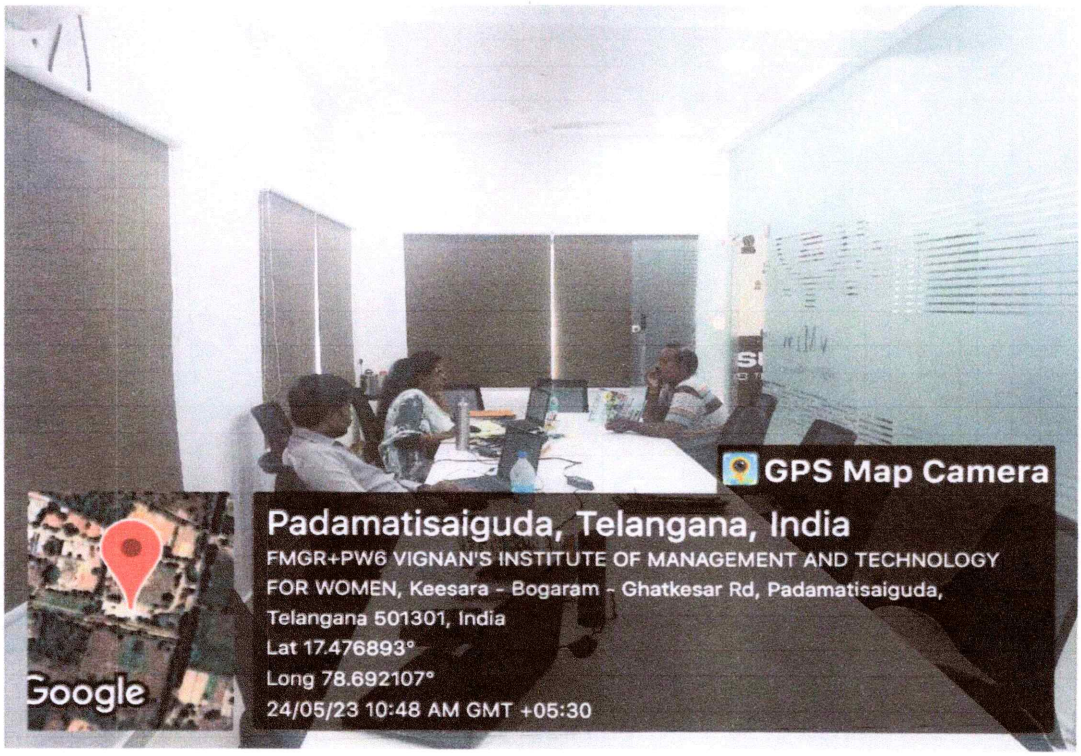


Use of LEDs in Placement Cell



Use of LEDs in Placement office Board Room

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Use of LEDs in Street lights

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Energy Conservation Measures:

Sensor-Based Energy Conservation

- Vignan Institute of management and Technology for Women is keenly focusing on effective of energy conservation within the campus.
- The institute implements Day-Night sensor based lollipop street lights 100W lights within the campus.
- The 60W and 40W LED Street lights are also implemented in the campus.
- The power factor is the measure of effective usage of electrical power. There will be the excess power consumption, if the power factor is less than unity.
- The implementation of Automatic Power Factor Control panel reduces the power consumption, losses in the power equipment's, greenhouse gases and electricity bills.
- Vignan Institute of management and Technology for Women implements sensor based Automatic Power Factor Control panel of 160KVA for effective energy conservation.

Sensor Lights at the Entrance

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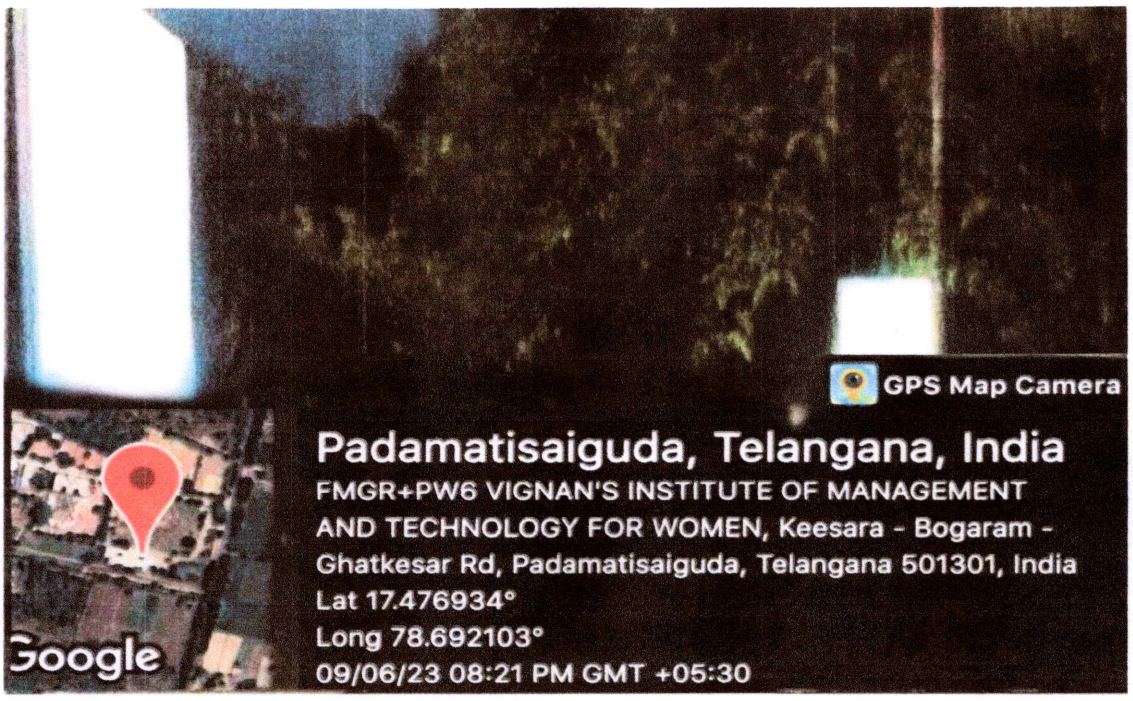

Sensor Lights at the Entrance

Infrared Motion Sensor:

- The working principle of an infrared sensor is similar to the object detection sensor. This sensor includes an IR LED & an IR Photodiode, so by combining these two can be formed as a photo-coupler otherwise optocoupler.
- The physics laws used in this sensor are planks radiation, Stephan Boltzmann & weins displacement.
- IR LED is one kind of transmitter that emits IR radiations. This LED looks similar to a standard LED and the radiation which is generated by this is not visible to the human eye. Infrared receivers mainly detect the radiation using an infrared transmitter.
- These infrared receivers are available in photodiodes form. IR Photodiodes are dissimilar as compared with usual photodiodes because they detect simply IR radiation.
- Different kinds of infrared receivers mainly exist depending on the voltage, wavelength, package, etc.

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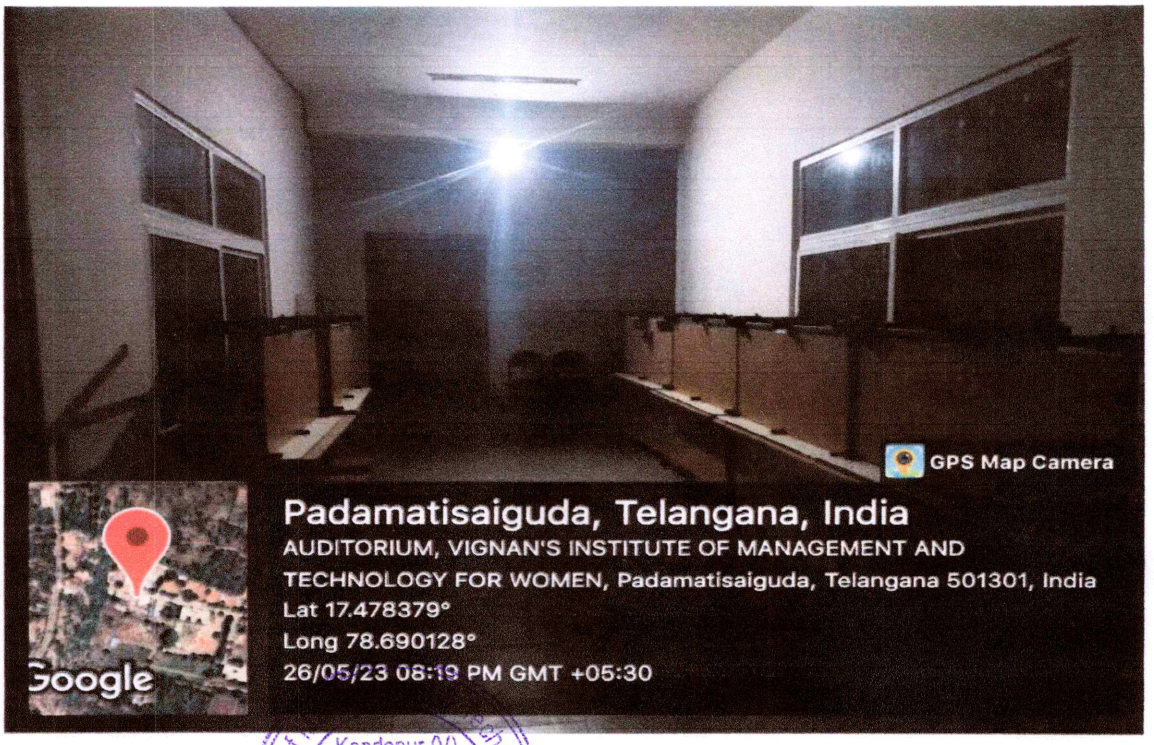

Infrared Motion Sensor based Light at corridor

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