

COMPLETED PBLs Department of EE Jan-June 2025



SOLAR POWERED STREET LIGHTING SYSTEM

This project presents the development of an automatic solar powered street lighting system using an Arduino microcontroller. The system aims to reduce energy consumption by using solar energy and to promote green technology. It uses a solar panel to charge a battery during the day, which then powers LED street lights at night. The Ardunio controls the lights based on ambient lights based on ambient light conditions using an LDR sensor. This project emphasizes sustainable energy usage, costeffectiveness, and energy efficiency in public lighting systems. The "Solar Powered Street Lighting System" project aims to design and implement an efficient, eco-friendly, and costeffective street lighting solution powered entirely by solar energy. This system utilizes photovoltaic (PV) panels to harness solar power during the day, which is then stored in batteries and used to illuminate LED street lights during the night. The project addresses the growing need for sustainable energy solutions, especially in areas where access to grid electricity is limited or unreliable.

SOLAR TRACKER SYSTEM

The Sun Tracker Solar system is an innovative solution aimed at maximizing the efficiency of solar energy generation. Solar panels traditionally remain fixed in one position, limiting their ability to capture sunlight throughout the day. A sun Tracker system uses intelligent tracking technology to follow the sun's path, ensuring that the panels receive optimal sunlight exposure throughout the day, leading to enhanced energy production. This project aims to design and develop a microcontroller-based sun tracker solar panel that utilizes the STM32 system microcontroller, integrated sensors, and real time tracking algorithms to optimize solar energy collection.



"CELEBRATING DREAMS"





SOLAR WATER PURIFIER

The "Solar Water Purifier" project focuses on developing a sustainable and energy-efficient solution to address the global challenge of providing clean and safe drinking water, especially in remote and resource-scarce areas. This system utilizes solar energy—an abundant and renewable resource-to purify contaminated or non-potable water through methods such as solar distillation or UV-based disinfection. The purifier harnesses sunlight using solar panels or thermal collectors to heat water or power a purification mechanism. One common technique involves a solar still, where water is evaporated using solar heat and then condensed to remove impurities, pathogens, and salts. Alternatively, photovoltaic panels can power a small pump and UV light system for more rapid and controlled purification.

LPG GAS DETECTOR

The "LPG Gas Detector" project aims to design and develop a safety device that can detect the presence of leaked Liquefied Petroleum Gas (LPG) in residential, commercial, or industrial environments. Since LPG is highly flammable and potentially hazardous, early detection of leaks is crucial to prevent fire accidents, explosions, and health risks. The system uses a gas sensor (such as MQ-6 or MQ-2) that can sense LPG concentration in the air. When the gas level exceeds a predefined safety threshold, the system activates an alarm (buzzer or siren) and can also trigger additional responses like turning off electrical appliances or sending an alert message. This project may be enhanced with microcontrollers (like Arduino), GSM modules for SMS alerts, and power backup systems.





AC TO DC CONVERTER USING VARIABLE LOAD

The "AC to DC Converter Using Variable Load" project focuses on designing and analyzing a power electronics system that converts alternating current (AC) into direct current (DC), with the ability to test its performance under different load conditions. This project simulates a real-world application of power conversion used in various electronic devices, battery charging systems, and equipment.The converter industrial circuit typically includes a transformer (for voltage level adjustment), a rectifier (to convert AC to pulsating DC), a filter (to smooth the output), and a voltage regulator (to maintain steady DC output). A variable resistive or electronic load will be incorporated to observe and study how the converter performs under changing load demands—evaluating efficiency, voltage stability, and thermal behavior.



SIGNAL JAMMER

In modern digital age mobile phones have become an essential part of human life, revolutionizing communication and connectivity. However there are certain environments where the presence of mobile signals can cause distraction security breaches or unauthorized information exchange. These environments include examination halls. military zones, religious places, prisons and sensitive government offices. Where maintaining silence, order confidentiality is critical.





STEP UP TRANSFORMER

Building a simple step up transformer using transistors and a 9 V Battery: in this project a basic circuit to step up voltage using a transistor based oscillator, a transformer, and a few basic components. The goal is to light a 6 watt bulb using a small 9V battery by stepping up the voltage. This project demonstrates the principle of voltage amplification, switching circuits, and basic transformer action in electronics.