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DEPARTMENT OF MECHANICAL ENGINEERING

Major Project Abstracts

Academic year: 2022-2023

Project coordinator- Dr.V.R.Khalkar

Academic year: 2022-2023

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MAJOR PROJECT ABSTRACTS

Academic year: 2022-2023

Name of the students	Title of the project	Abstract
Mr. Prabodhan Anil Gamare Miss. Samidha Santosh Shinde Mr. Pranay Chandrakant Jadhav Mr. Saurabh Sadanand Lad	Transmission System of BAJAATV	Our objective was to design, engineer, build and test Power transmission, Suspension system of an ATV (All-terrain vehicle) within the limits of the rules of SAE (Society of Automotive Engineers) India. This study presents the design methodology, design analysis processes and mathematical study of these systems designed for engineering design competition of BAJA SAE India 2018, which is a national ATV design competition organized by SAE India. Considering difficult track and off-road environment for an ATV, various test conditions are incorporated such as different impact tests, Traction test, manoeuvrability test, Acceleration and Brake test to get the design parameters for the competitive performance and around those parameters designing is done for the ruggedness over rough terrain with reliable performance in a cost-effective manner. This design is then implemented and tested for the required performance parameter. The goal was to achieve reliable performance, durability, market-ready and maintainable systems which conform to each other to give our ATV a versatile driving capacity and make it suitable for economic production. As a result, we were able to achieve the maximum Speed of 50 km/hr. with 70% grade ability, 300 mm ground clearance with 362 mm center of gravity, turning radius of 1.85 meters and stopping distance of 3-4 meter.
Patne rutik nilesh Zujam vivek vasant Rane manthan ankush Baviskar suyog kailas	Solar power utilization for heat storage	Solar energy is the most available, clean, and inexpensive source of energy among the other renewable sources of energy. Solar energy it is a source of energy which have high intensity. This high solar radiation could be utilized to produce steam and then could be used to produce electricity. This work was deal with utilization of sunlight with the help of convex lens to produce steam. The solar collectors using lens to concentrate heat from the sun upon the receiving tank to produce steam. This work deals with experimental steady to determine the performance utilization of sunlight through lens to produce steam for various reasons. The results of this work produce steam at temperature 200 ?C+. Solar steam generation with low-cost and excellent energy efficiency is of great significance for alleviating an energy crisis, reducing water pollution and promoting seawater desalination. However, there are still numerous challenges for solar steam generation system to practical energy utilization. We studied a series of effecting factors for solar

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		steam generation.
Mr. Mhadlekar Gaurav Ganesh Mr. Padyal Vaibhav Vijay Mr. More Yash Pravin Mr. Pawar Aniket Anant	Effect of multi-walled carbon nano tube on mechanical behaviour of GLARE	The present research work has been undertaken with an objective to fabricate the combination of sandwich structure-AA/GF/AA. Sandwich structures are new type of composite materials which could improve the defects of traditional composites in ductility, formability, impact and damage tolerance. In this research work Multi- walled Carbon Nano Tubes (MWCNT) is used as nano filler that is dispersed with the Epoxy resin at different percentage of weight like-3%, 4% and 5%. The fabrication of samples is done with the help of hand layup technique which is a cost effective method. Dispersion of nano filler (MWCNT) particles in resin simply improves the mechanical properties, electrical and flame retardant properties of the sandwich materials. Macro characterization of sandwich structure is done with the help of numerous mechanical tests like-tensile, flexural, izod impact test. The formability parameters and mechanical properties are determined from the tests performed.
Lodhi fulchandra ramdev Mali raj ramesh Mali sahil ramesh More rushikesh shankar	Development of 3d printing filament using waste plastic	The main purpose behind this project is "Development of 3D printing filament by using waste plastic". In recent times , the issue of plastic recycling has become one of the leading issues of environment protection and waste management . The objective of this research is"Using plastic waste to create 3D printing filaments". Polymer materials are used in many years in many areas of daily life and industry. With their long - term use, the problem of plastic waste arise as they become persistent harmful waste after they cease to be used . Environment pollution by recycling plastic waste and provide a cost-effective alternative to traditional 3D printing filament . The process involves shredding and melting plastic waste waste, extruding the molten plastic into filaments, which are then wound onto spools. The resulting filament were then tested for physical properties such as tensile strength, elongation at break , and uniformity of selection . The study concluded that plastic waste can be effectively used to produce 3D printing filaments with properties comparable to conventional filament. This approach has the potential to significant reduce the amount of plastic waste in the environment, while providing a sustainable source of 3D printing . filament can be made from various waste plastic such as PET, ABS , PLA . The end product meet the quality standards required for 3D printing .This approach offer

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		viable solution toenvironment and economics challenges , turning waste into a valuable resource for the 3D printing industry . Quality control measures and testing methods used to ensure consistency and reliability of the final product are also discussed. Using waste plastic to produce 3D printing filaments has potential to revolutionize the 3D printing and contribute to a more sustainable future.
kazi zubair mustkim mukadam mohammad kaif noor shaikhnag ashar khalid bavdhane tejas tukaram	Design, analysis and assembly of atv braking system and steering mechanism	All-terrains-vehicles (ATV) are largely used in forest working and patrolling,supporting rangers and many other workers. Now a days even in racings. A titanic factor in handling of any vehicle is making it come quick and easy stop. It is prerequisite to retard the vehicle in order to get over all control by driver. The very first vital part is to select the one perfect mechanism to actuate the brakes. Even though there are numerous mechanisms for actuating brakes hydraulically actuated disc brakes have been used for both front and rear. The safety while braking is first and foremost and reckoned by evaluating mathematical model of braking. The evaluation of models is done by calculating various braking parameters such as applicable forces under certain circumstances. The data used to achieve average values of design parameters, making the theoretical calculations as realistic as possible. The work emphasis design of braking system, includes numerous mathematical calculations, CAD designs and analysis of various components to achieve optimum, yet effective braking.
Mr. Kalekar Nivrutti Vasant Mr. Lohar Anuj Anil Mr. Mankar Pranit Prakash Mr. Nachankar Abhishek Chandrakant	Redesign And Analysis Of Suspension System For An All Terrain Vehicle (ATV)	In this report our work was to study the static and dynamic parameter of the suspension system of an ATV by determining and analyzing the dynamics of the vehicle when driving on an off road racetrack. Though, there are many parameters which affect the performance of the ATV, the scope of this paper work is limited to optimization, determination, redesign and analysis of suspension systems and to integrate them into whole vehicle systems for best results. The goals were to identify and optimize the parameters affecting the dynamic performance suspension systems within limitations of time, equipment and data from manufacturer. In this project we will also come across the following aspects a. Workout the parameters by analysis, design, and optimization of suspension system. b. Study of existing suspension systems and parameters affecting its performance. c. Determination of design parameters for suspension system.

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Indraneel Kishor Phadke Shubham Hemant Bhagwat Chinmay Prashant Bendarkar Saurabh Narayan Patil	Experimental comparison of pcm through solar fish dryer	This project aims to investigate and compare the performance of different Phase Change Materials (PCMs) in a solar fish dryer system. Fish drying is a traditional preservation method, and solar dryers offer an environmentally friendly and cost-effective alternative to conventional drying methods. The incorporation of PCMs in solar dryers has shown promising potential in enhancing the drying efficiency and preserving the quality of dried products. The study involves designing and constructing a solar fish dryer prototype equipped with PCM containers. Various PCMs with different melting points and thermal properties will be tested to assess their impact on the drying process. The dryer's performance will be evaluated based on parameters such as drying time, moisture removal rate, temperature distribution, and fish quality attributes like color, texture, and nutritional content. Experimental trials will be conducted under controlled conditions using different PCM configurations and solar radiation levels. Data on drying kinetics, energy consumption, and fish quality will be collected and analyzed. The results will provide insights into the effectiveness of PCM utilization in solar fish dryers and identify the most suitable PCM for efficient and sustainable fish drying applications. The outcomes of this research will contribute to the development of improved solar drying technologies for the fish industry, promoting energy efficiency, reduced post-harvest losses, and enhanced product quality. The findings will serve as a valuable reference for researchers, engineers, and policymakers interested in the advancement of sustainable food preservation methods utilizing solar energy and phase change materials.