



# **SRINIVAS UNIVERSITY**

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on**

## **RECENT INNOVATIONS IN MECHANICAL ENGINEERING (RIME-2020)**

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# **BOOK OF ABSTRACTS**

**COLLEGE OF ENGINEERING & TECHNOLOGY**

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## **Present Scenario of Blast Furnace Iron Making in India**

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### **Abstract**

The extraction of pig iron or hot Metal from its ores dates back to prehistoric times. However, after 14<sup>th</sup> century, furnaces were developed that could both reduce iron ore and melt it so that it can be cast from furnace in liquid form. Blast Furnace iron making is reduction of iron ore (hematite, magnetite etc.) to its lower oxides and ultimately to iron in molten state in the hearth of blast furnace, where it picks carbon from coke (source of heat and reducing gases). Today's modern large blast furnaces with very high production rates and excellent fuel efficiency are the result of years of technical and engineering development of this metallurgical process. In 1910, there was hardly 80000 tons of crude steel production in the world and today the world production has crossed 1800 Million ton. Out of this 1800 MT, more than 60% comes from BF-BOF route. In today's highly competitive world, only producing large quantity of steel is not enough, it has to be cost competitive also. After the World War II, the steel consumption increased tremendously and hence countries started building larger blast furnaces (~4000m<sup>3</sup> useful volume).

India has emerged as the 2<sup>nd</sup> largest producer of steel after China in 2018. In 2018, India produced 109 MT of crude steel. The Hot Metal production through Blast Furnace is also increasing year by year 38 MT in 2009 while 72 MT in 2018. In India, JSW has become the largest steel producer with 16.7MT crude steel production in 2018-19 while SAIL produced 16.23 MT of crude steel in same year. Our per capita steel consumption has increased from 66 Kg in 2018 to 71 kg in 2019 but it is too less as compared to the global figure of 225 kg.

In the late 90's, Korean Steel major, POSCO came up with environment friendly CORUS and FINEX module of Iron making but could not match the high productivity and efficiency of a blast furnace and hence till today only 2 modules have been installed in India and that in JSW Bellary only.

## **Use of Compression Packings in Mechanical Equipments**

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### **Abstract:**

Control of fluid loss is essential to the successful operation of mechanical equipment used in fluid handling. Various methods are utilized to control leakage at shafts, rods, or valve stems and other functional parts of equipment requiring containment of liquids or gases. The oldest and still most common of these sealing devices is compression packing, so called because of the manner in which it performs the sealing function. Made from relatively soft, pliant materials, compression or mechanical packings consist of a number rings, which are inserted into the annular space (stuffing Box) between the rotating or reciprocating member and the body of the pump or valve. By tightening a follower or packing gland against the top or outboard ring, pressure is transmitted to the packing set, which expands the rings radially against the side of the stuffing box and the reciprocating or rotating member and effects a seal.

The compression packing's find their major use in the process industries (e.g. petrochemical, pharmaceutical, chemical, pulp & paper, steel mills) and the service industries (e.g. utilities, marine, water, sewage, food, fossil/nuclear power plants)

# **A Study on Manganese Steels Castings**

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## **Abstract**

Manganese is a basic and alloying element in wrought structural and austenitic manganese steels. Austenitic microstructure is desired in steels for its non-magnetic quality, the greater toughness and formability that the fcc austenite phase imparts to the steel compared with the more common bcc ferrite phase. The major function of manganese was present in such steels seems to be as an austenite stabilizer, hence manganese is the most widely used alloying element in the production of classic steels. This paper will cover the applications, grades, properties and the production methods of manganese steels and also briefed the effects of various elements on manganese steel castings in an easily understood way.

## **Applications of Machine Vision**

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### **Abstract**

Machine vision (system vision) it's a apply computer vision in industry. While computer vision is focused mainly on image processing at the level of hardware, machine vision most often requires the use of additional hardware I/O (input/output) and computer networks to transmit information generated by the other process components, such as a robot arm. Machine vision is a subcategory of engineering machinery, dealing with issues of information technology, optics, mechanics and industrial automation. One of the most common applications of machine vision is inspection of the products such as microprocessors, cars, food and pharmaceuticals. Machine vision systems are used increasingly to solve problems of industrial inspection, allowing for complete automation of the inspection process and to increase its accuracy and efficiency. As is the case for inspection of products on the production line, made by people, so in case of application for that purpose machine vision systems are used digital cameras, smart cameras and image processing software. This paper presents the possible applications of machine vision in the present.



## **Two Wheeled Balancing Robots**

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### **Abstract**

Two wheeled balancing robots are based on inverted pendulum configuration which rely upon dynamic balancing systems for balancing and maneuvering. These robot bases provide exceptional robustness and capability due to their smaller size and power requirements. Outcome of research in this field had led to the birth of robots such as Segway, Murata boy etc. Such robots find their applications in surveillance & transportation purpose.

This work is based on development of a self balanced two wheeled robot which has a configuration similar to a bicycle. In particular, the focus is on the electro-mechanical mechanisms & control algorithms required to enable the robot to perceive and act in real time for a dynamically changing world. While these techniques are applicable to many robot applications, the construction of sensors, filters and actuator system is a learning experience.

## **Manufacturing of EDM Electrode by Selective Laser Sintering Method for SS316L Material**

Shashank S<sup>1</sup>, Dr. Thomas Pinto<sup>2</sup>, Dr. C.G Ramachandra<sup>3</sup>, Raghavendra M. J.<sup>4</sup>,  
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### **Abstract:**

Electrical discharge machining (EDM) is a non-conventional machining process widely used to manufacture intricate shapes in hard materials, which are not easily machined, by conventional machining process. The production of geometrically complex Electrical discharge machining electrode is difficult and time consuming. Selective laser sintering (SLS) can be used as an alternative technique to produce Electrical discharge machining electrode in a faster way. This work involves manufacturing of Electrical discharge machining electrode made up of Stainless Steel 316L (SS316L) by direct metal laser sintering machine. This method of Laser sintering of SS316L improves the electrical discharge machining electrode density and also greater tolerance can be achieved.

# **Implementation of Automatic Dipper Systems for Head Lights in Vehicles- A Review**

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## **Abstract**

The number of vehicles on our roads are increasing day by day. There is also a need for vehicle manufacturers to think regarding additional safety features to be introduced in the vehicle with electronic controls. One such safety feature which is to be added to the vehicle is the automatic upper dipper control of head light. Human eyes are very light-sensitive. If the eyes suddenly comes in contact with the light after darkness, Cornea in the eyes will get contracted and the vision will be lost for a while and requires some time to recover the sight. Most times the situation comes when the vehicles unexpectedly approach from the front with upper mode headlight triggering the driver's blindness. The driver has to dip the headlight manually in this case. To overcome the manual dipping problem which in the case of highways or heavy traffic areas is a cumbersome process. The paper discusses the different mechanisms used in the upper and dipper automatic systems.

## **Design and Fabrication of Transformable Wheel Chair**

Arun V<sup>1</sup>, Anil M D<sup>2</sup>

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### **ABSTRACT**

There are several types of manual, motorized wheel chairs are available in market. The formation of a compact type of wheel chair that motorized with adjustable proceeding provides much better comfort to use. Installation of adjustable speed motor provides the transportation on a single hand. And maintaining suitable height ensure care to handle the patient. A manually or automatically control adjusting bed-chair combination for persons suffering limited mobility due to accident, disease, or age who thus require intensive care giving efforts by others. This portable body supporting device provides a patient with greater mobility and self-care even if he/she is confined therein for weeks, months, or longer. The bed-chair includes an upper frame for supporting the invalid's body in a large number of postures ranging from side, supine, sitting, reclining or standing. In turn, this upper frame is articulated by lower supporting frames powered by linear actuators, or the equivalent, and controlled manually by bystander. Whether in bed or chair mode, the support frame consists of an upper body, middle and leg- foot segment. The mid-section provides a base to which the other two sections are pivotally mounted. Turning the middle section up to 20 right or left relieves the local pressure on skin and other tissue yielding comfort and avoiding ulceration, cramping and discomfort. The optional accessories further increase the freedom of choice of more positions, actions, and controls, even to sensing difficulty and aiding excretion along with the option of using vibration and other therapeutic stimulations. The bed-chair's diverse positions enable easier entrance and exit. Ready disassembly into three or more sections facilitates transport. A mattress with special foam distributes the body weight over maximum area while cervical and lumbar supports plus adjustable edge tubes give security and comfort choice to abet healing.

## **Fabrication and Characterization of Fiber-Reinforced Composite (FRC) using Kaveripatti Fibers**

Ananthkrishna Somayaji<sup>1</sup>, Dr Narasimha Marakala<sup>2</sup>, Kini Gurpur Vignesh<sup>3</sup>, M Ashutosh Prabhu<sup>4</sup>

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### **Abstract**

The investigation aims to produce a fiber-reinforced composite (FRC) using Kaveripatti fiber which should impart better mechanical characteristics over conventional synthetic fibers and contemporary wood, meanwhile possibly replacing them by countering its disadvantages. We have analyzed the mechanical characteristics at various percentages of fiber content in the FRC i.e. at 10%, 15% and 20% including alkali treatment at various time intervals from 0h to 8h at the increment of 2h for each percentage respectively. This also allows us to reuse the polyester resin which in turn reduces the plastic waste in the 21<sup>st</sup> century environment. Hence considering its overall impact on the environment, excellent cyclic properties of scrap FRC's allows it to be recycled up to 20%, unlike other composite materials. The fabrication process done by hand lay-up process has also allowed us to control the weight of the final structure and the cost of manufacturing the prototype pieces. Significant implications of this composite include in manufacturing sector of transport industry and for major domestic appliances which use conventional wood.

## **Fabrication and Analysis of Solar Air Heater**

Gurudatta S. Shahapurkar<sup>1</sup>, G. Phaldessai<sup>2</sup>, J. Kurian<sup>3</sup>

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### **Abstract**

In many countries, the use of solar thermal systems in the agricultural area to dry vegetables, fruits, coffee and other crops has shown to be practical, economical and the responsible approach environmentally. The traditional approach is less economical so there is a need to find an alternative approach. In this report, fabrication and analysis of solar air heater is done for various absorber materials. Various easily accessible solar absorbing materials such as pebbles, wire mesh, sand, and wood were analyzed to determine which material has higher temperatures and collector efficiency. Factors like temperature, air speed and humidity are crucial in this study. The project consists of several experiments and sequential procedure as discussed further in the report.

## **Nickel Composite Electrodeposited Coating- A Review**

Varadaraj S<sup>1</sup>, Arbaz Aziz Shaikh<sup>2</sup>, Mohammed Rayeez<sup>3</sup>, Mohammed Parvez<sup>4</sup>, Mohammed Afif<sup>5</sup>

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### **Abstract**

Metals are susceptible to corrosion and lose their luster when they are exposed to the external environment for an extended period of time. Protective Coating has emerged as a possible alternative to solve these issues. Protective coatings on the metal surface are primarily done to prevent damage from the external environment. Electrodeposition is one of the prominent and cost effective technique for the preparation of alloy coating. It is possible to obtain wide varieties of properties by altering the parameters during the deposition. Nickel has gained popularity over the years due to its uniformity in putting thickness on the plated surface and the ease with which complex components can be plated. A good number of composite Ni-alloy coating have been compared for their characterization and mechanical properties. The current paper compares similar nickel composite coating i.e. (Zn-Ni-Mn / Zn-Ni, Ni-Gr, Ni-P, NI-CNT, Cr-Ni, etc.).

# **Microstructural and Mechanical Characterization of Copper Coating on Stainless Steel**

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## **Abstract**

Copper electroplating is used in various industries for applications like protection of base metal, improving conductivity, antimicrobial protection in hospitals.

Copper was coated on Stainless Steel substrate by electrodeposition process. The Electrodeposition was carried out in non-cyanide alkaline electrolyte bath with the current density of 2 A dm<sup>-2</sup>. A study was made about the effect of coating time on Microstructural and Mechanical characteristics of copper coating. The morphology and phase structure of the deposited copper was examined using Scanning Electron Microscopy (SEM) and X-ray Diffraction (XRD) respectively. SEM characterization shows the nanorod structure of the deposited film. XRD patterns confirmed that uniform red brown color coating deposited on the stainless steel substrate was pure copper with face centered cubic (FCC) crystal lattice. Effect of coating time on crystallite size, coating thickness, cathode current efficiency and surface roughness of the coating has been studied. Mechanical characteristics of the coating like scratch resistance, hardness and adhesion strength has been determined for coating time of 10, 15 and 25 minutes. The results obtained for various coating time was compared and concluded. The optimum coating time was chosen.



## **Design and Fabrication of an Automated Guided Vehicle (AGV) for Seed Sowing and Monitoring Applications**

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### **Abstract:**

Agricultural robotics is an emerging technology which deals with applying robotics technology to solve various challenges in agricultural sector. Automation in agricultural robotics system has been developed to implement a number of agricultural activities such as picking, harvesting, monitoring, weeding, seeding, fertilizer, irrigation etc. In this project we have designed and fabricated an embedded system to solve challenges in soil-based applications of Seeding, Fertilizer, and Irrigation. In this project we have designed and fabricated an AGV (Automated Guided Vehicle) model that will minimize the labor of farmers, increasing the speed of the work and thereby increasing the yield. The AGV designed is controlled by an Arduino. The major advantage of this project is that it is solar powered. There is also a provision given to charge the battery. It performs functions like sowing seed, applies water in right amounts to the farming plot, applies fertilizers and maintains the right soil pH levels.

## **Increasing Productivity in Gear Manufacturing**

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### **ABSTRACT**

There is a need to increase the productivity of gear manufacturing. This can be done by proper selection of sequence of operation namely rough hobbing, chamfering and finish hobbing, which can happen on a single machine prior to heat treatment. The finish hobbing operation will be an alternate to the gear shaving operation. It is also possible to carry out finish hobbing after heat treatment and this will serve as an alternate to teeth grinding. In either case the hob should have a roughing zone and a finishing zone with chamfer cut tools in between. Dry hobbing is preferred to wet hobbing so that the coolant and its circulatory system can be dispensed with. For dry hobbing, a suitable hob material has to be selected. The machine used should have the horizontal configuration with proper chip disposal arrangement. For this, the proper selection of tool material, machine and technique should be adopted. The diagonal hobbing technique should be adopted to overcome the twist in helical teeth.

# **Study on Performance Analysis of Solar Powered Desalination System for Life Boat**

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## **Abstract**

A solar powered desalination system is developed for Life boats that can purify water from nearly any source, a system that is relatively cheap, portable, and depends only on renewable solar energy. The motivation for this project is the limited availability of clean water in Life boat. As per the SOLAS, 1.5L of water is reserved/person for 3 days, which is not sufficient. The main aim of this work is to efficiently produce clean water from solar energy conversion inside Life boat and to add the water kept inside the life boat. Distillation requires an energy input as heat, electricity and solar radiation can be the source of energy. When solar energy is used for this purpose, it is known as solar water desalination. Solar distillation is an attractive process to produce portable water using free of cost solar energy. This energy is used directly for evaporating water inside a device usually termed as 'solar still'. The use of solar thermal energy in seawater desalination application is implemented in the Life boats where there is specific regulation on drinking water. This desalination system provides fresh water in efficient way by using only solar energy.

# **Dependency Relationships with Technology, Organization and People in Micro and Small Scale Industries to Improve Sustainability**

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## **Abstract**

Developing country like India largely depends on micro and small scale industries to improve per capita income of individual. When compared with market of previous century and this, the market condition is very dynamic in nature. Each people will ask new design or each may have their own personalized or customized requirements. In this market condition sustainability of the micro and small scale industries dependent on how they perform in dynamic market. The performance of each organization varies with their integration with technology, organization and people. The level of integration of technology, organization and people in each industry reflect with performance and improved sustainability. From ministry of small and medium enterprise report in 2017-2018 around 236262 industries are closed all over India. This number can reduce with the help of integration of technology, organization and people in micro and small scale industries. in this study around 22 industries are visited know the level of integration with the help of 83 questionnaires. The questionnaires prepared with help of agile manufacturing enablers and each question and answers depends on another question. From the study it is noticed that the sustainability of the micro and small scale industries are very poor in this market condition due lack of integration of technology, organization and people. There is huge opportunity for all the industries to improve sustainability by adopting agile methodologies for existing organization without much investment.

# **Analysis of Different Blends of Biodiesel on Tribological Property of IC Engine Components**

Venkata Sundar Rao K<sup>1</sup>, Shreeprakash B<sup>2</sup>

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## **Abstract**

The Diesel engine is Internal Combustion engine, on combustion of fossil fuel, high pressure and high temperature gases makes the piston to move. This reciprocating motion is converted into rotary motion for applications in industry, power generation, automobiles and marine applications. The chemical energy of fuel is converted into mechanical energy in the process of conversion of energy. Surface wear test was carried out to analyze the variation of surface roughness ( $R_a$ ) value for different blends of biodiesel considered. The blend of Hippo oil has better lubrication properties exhibited as compared to diesel and other biodiesel blends considered.

## **Effect of Precipitation Hardening and Deformation Aided Aging Treatment on Hybrid Aluminium Alloy Composites**

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### **Abstract**

With the growing in demand of light-weight substances in a number of the emerging business programs, the tendencies in materials deals with alloying of aluminium with different elements are vital to provide the higher strengths, hardness needed for commercial packages. In this context aluminium alloy – silicon carbide – boron carbide composites find extensive software in internal plates of ballistic vests, high strain water jet cutter nozzle and additionally as Neutron absorber in nuclear reactors. Along with these programs they also own suitable wear resistance, high precise power, accurate thermal stability and high modulus of elasticity. In the modern-day have a look at, simple composites and hybrid composite were fabricated by way of step stir casting technique with different weight fraction of reinforcements. The precipitation hardening remedy and cold deformation assisted age hardening called low temperature thermo-mechanical treatment (LTMT) are performed. Peak hardness of the specimen at these growing older temperatures is determined. With the growth in the growing old temperature, the time to attain peak hardness value decreased while the hardness fee is also decreases.

# **Experimental Investigation of Different Biodiesel Blends (80% Diesel + 20% Biodiesel) on Tribological Property of IC Engine New Components**

Venkata Sundar Rao K<sup>1</sup>, Shreeprakash B<sup>2</sup>

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## **Abstract**

Tribology is the study of interacting surfaces in relative motion including the subject of friction, wear and lubrication. The design of an IC engine can be refined by the use of suitable materials for the combustion of alternative fuels blended with diesel. The comparison of the surface roughness ( $R_a$ ) values is done to investigate the surface roughness of the IC Engine new components considered for the study. The duration of the test considered is 2 hours, 4 hours and 6 hours running of IC Engine. The blend of 80% Diesel + 20% Hippo oil has better lubrication properties exhibited as compared to diesel and other blends of biodiesels considered.

# **Implementation of Product Lifecycle Management in Small Scale Foundry in the Area of Manufacturing Process Management - A Case Study**

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## **Abstract**

The foundry industry, small to medium sized industries, has the obscurity of implementing enhancements in its interior logistics scheme, and, it has to deal with the troubles arising in the company. The product lifecycle management is seen as main infiltrate route and is widely used by major industries all over the world. The Product Lifecycle Management is distinguished as a part of manufacturing system that is concentrating in continuous flow within supply chain by removing all wastes and effecting unremitting development towards product excellence. This paper deals with the manufacturing process management that can be used in small scale foundry by finding the problems existing in these processes and implementing the various product lifecycle management tools and analyzing the results of a case study.



## **Wind Power Generation on Railway and Subway**

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### **Abstract**

The energy is the ability to do work and it surrounds us in all aspects of life. The ability to harness the energy and use it for constructive ends as economically as possible is the challenge before mankind. The energy can be tapped and used at a commonly used system- the rail track power generation. The number of trains passing over the track is increasing day by day. A large amount of energy is wasted at the railway track during the rolling of trains on the track, every time a train passes over it. There is great possibility of tapping this energy and wind turbines within boxes.

In addition to the rail track power generation, an attempt is made to generate power using the wind energy by the power generation system at the track during the train movement. The power generated will be used to charge the battery, which can be used for the street light purpose and other agriculture usage beside the railway track.

## **Corrosion Studies of Electrodeposited Zn-Fe Alloy Coatings**

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### **Abstract**

New electrolytic bath solution was optimized for the electrodeposition of nanostructured Zn-Fe alloy coatings on a mild steel. The influence of the bath composition and the current density on coatings were investigated. The corrosion behavior of the developed coatings was evaluated by the Potentiodynamic Polarization and Electrochemical Impedance Spectroscopy methods in 3.5% NaCl solution. The work reveals the excellent corrosion resistance ability of the coatings at 3 A dm<sup>-2</sup>. Hardness of the coatings evaluated using Vickers hardness test was increasing with the c.d. and was maximum at 4 A dm<sup>-2</sup>. Roughness of the Zn-Fe alloy coatings was obtained using Atomic Force Microscope (AFM). These coatings were characterized by XRD and SEM-EDX. Phase structure and Texture coefficient and the crystallite grain size of the coatings were calculated and discussed using XRD

# **Information Sciences and Computing Specializations in Mechanical Engineering: Educational Context - Indian Context**

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## **Abstract**

Information Science is an important interdisciplinary field of study and dedicated in information activities ranging from collection, selection, organization, processing, management and dissemination. There are basic differences among the computing and IT subjects with the Information Science. Initially Information Science only considered as a branch of information with manual tools and systems and gradually it is become a field of practice and applicable in diverse fields and sectors. After the advent of Information Technology many changes are noted in the field of Information Science and among these most important are inclusions of various Information Technology Components in the Information Science programs. Gradually in recent past universities and educational institutes are started to offer Information Science programs with various emerging technologies viz. Cloud Computing, Big Data, Analytics, Human Computer Interactions, Usability Engineering etc. Further some of the emerging mechanical science and technology areas also been incorporated in Information Science programs viz. Robotics, Artificial Intelligence, Intelligent Systems etc. This paper is a review and conceptual work and dedicated in depicting Information Science as a field with the potentiality of Mechanical Science related emerging degrees and programs in Information Science at different level. Paper highlights the opportunities and strategies in this regard as well.

# **Robotics the way for Intelligent and Digital Society Building - An Overview**

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## **Abstract**

Robotics is an important branch and emerging technology related to the Artificial Intelligence. And it involves with the designing, construction, use of the robots in different systems, and products. Further in services also Robotics features can be found. Robotics and its allied systems including intelligent machines are increasing day by day and it helps in making lives easy. Since Robotics is an important interdisciplinary field therefore it also connected with some of the areas viz. Mechanical Engineering, Electric Engineering, Computer Engineering, Information Technology. Robotics is dedicated in the development of the machines which are able in substitute for humans and replicate human activities in many contexts. Robots are useful different activities and sectors for the betterment viz. dangerous environments, manufacturing processes, space, underwater, high heat management, in the process of clean up, materials and radiation etc. Moreover, in replicating of walking, lifting, other human activity performance also Robotics is important. The field Robotics is surrounded by the allied technologies such as Artificial Intelligence, Intelligent Systems etc. and all together these are responsible in making of Digital Society easily with proper transformation. This paper is a basic review one and mainly illustrates about the foundation aspect of Robotics including its features, functions, importance and role in general.

## **Electronic Brake Force Distribution (EBFD) Using Load Sensors**

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### **Abstract**

When compared with olden days life span of human is reduced. Death rate due to accident is drastically increased because vehicles usage is increasing by day by day. Due to brake failure so many accidents are occurring so when we control the brake by EBFD system, we can reduce the effect of accident. A speed sensor is placed in front of vehicle and that setup consists of load sensing devices. Electronic Control Unit: It is a small chip which collects the data from the speed sensors in each wheel and uses the data to calculate the slip ratio. The EBFD system maximizes the effectiveness of the brakes by allowing the rear brakes to supply a greater proportion of the braking force. It functions by adjusting the distribution of braking force to the rear wheels in accordance with the vehicle's loading condition and speed. The EBFD system is an integral part of the ABS system and uses some of the ABS system's components to perform its function of optimizing the distribution of braking force.

# **Less is More: Lean Six Sigma Framework for Educational Institutes**

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## **Abstract**

Lean was introduced by Toyota, Japan to reduce the cycle time and cost. The roots of Lean manufacturing date back TO Hendry Ford and his innovative techniques to produce best quality at lower cost. Basically, Lean is a philosophy which intends to reduce cost without hampering the quality of the product. Recently, Lean Six sigma is applied in an educational setting and cost reduction is the main moto. Delivering high quality education is becoming key for the success of higher education institutes. The implementation of Lean Six sigma is critical for the success of College/ University. However, for many decision makers it's unclear how Lean Six sigma can be implemented in an educational setting. The main intent of this research paper is to provide framework how Lean Six sigma can be implemented in Universities/Colleges. Paper is based on the review of research papers and site visits of Universities and Colleges in Dakshina Kannada district in coastal Karnataka.

## **Design and Fabrication of Leaf Collector**

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### **Abstract**

Leaves scattered on the parks, passages, and other places have a detrimental effect on the beauty of the environment, and decrease photosynthesis, hence, the efficiency of plants. Leaves are also used in the production of peat. This makes using leaves collectors in parks, and organizations with a green space useful. Due to the fact that leaves take up a high volume, their transportation is difficult. Using the machine introduced in the paper of Design and fabrication of a tractor powered leaves collector machine equipped with suction-blower system which was equipped with a suction-blower system, increases efficiency, and at the same time decreases the costs of green space, and their workforce cost. Focusing on overcoming the mentioned difficulties, this study was carried out in order to design and produce a tractor powered leaves collector equipped with suction-blower system. Various designs were studied and based on their advantages and disadvantages, the best design was selected. The initial modeling was carried out using the engineering software of solid works. The remaining parts of plants and other agricultural activities are decomposed in a natural cycle. Then they are used as organic materials for modifying soil texture which is useful for the life of crops, garden plants, and greenhouse plants. Moreover. Soil fertility is improved using green manure. Having been chemically and biologically processed, leaves are used as animal feed. In Agricultural field farmers use dry leaves mixed with cow dung used as manure. To collect leaves it require more man power and it will take more time. It takes more time and affects economy of the farmer. Now a days severe labour shortage is faced by agriculturists the mechanization is badly needed. In this regard our group planned to develop a leaf collector to collect the scattered leaves with a higher rate and in less cost.

## **Design and Fabrication of Self Power Generating Electric Bicycle**

Deviprasad Shetty<sup>1</sup>, Kiranagouda<sup>1</sup>, Sachin H.J<sup>1</sup>, Thilak D Shetty<sup>1</sup>, Sudheendra P Hebbar<sup>2</sup>

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### **Abstract**

Now days vehicle are part of our fast life for transportation. Vehicles play a very important role in growth of economy. The main drawbacks of vehicles are they pollute the environment by of combusting fossil fuel majorly contributing for global warming. Along with this consideration, Increase in fuel price, efficiency we must admit that it is far better to use bicycle over a motor vehicle for short distance travelling. This drawback can be reduced by using eco-friendly technology. One example for eco-friendly technology is electrical vehicle with limitations. To overcome one of the some of the limitations, we planning to develop a design of self-power generating electrical vehicle in bikes. Self-power generating e-bikes are nothing but vehicles which generate power on own by using modified equipment and drive the vehicles without any external energy source. This is charged internally without any effect on operation of self-power generating vehicles. The unit developed by us is a combination of the standard geared bicycle with an electric power motor cum alternator that would assist the rider throughout his journey. While travelling on a gradient and energy used by the bicycle is more. For minimizing this problem, we are using kinetic energy recovery system by designing the flywheel for recovering the moving bicycle energy under breaking and also to convert the usual loss in kinetic energy into gain in kinetic energy. When riding a bicycle, a great amount of kinetic energy is lost while breaking. To use this energy, weare using a flywheel to store the energy which is normally lost during breaking and reuse it to help propel the rider when starting. By designing the flywheel which is more suitable to the frame properties and rider compatibility the efforts of the rider can be reduce. Also we are re using kinetic to electrical energy to charge battery.



# **Design and Fabrication of Machine to Convert Waste Plastic to Oil and Analysis of Diesel Engine Using Waste Plastic Oil and Diesel Blends**

Deekshitha<sup>1</sup>, Rithesh<sup>1</sup>, Sujith Kulal<sup>1</sup>, Pratiksha Irin Gomes<sup>1</sup>, Raghavendra E H<sup>2</sup>  
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## **Abstract**

Plastics are one of the most commonly used materials in our daily life. They are widely used in manufacture of products as electronic, automotive, etc. Plastics are light weight and can be simply formed. Due to their non-corrosive behavior they are reusable and conserve natural resources. Resultantly, there has been a quick development and has replaced wooden and glass products in daily life. Plastic was invented by Alexander Parkes in 1860 and has high molecular mass. They are synthetic organic materials produced by polymerization. They contain other substances besides polymers which reduce costs and improve performance. Desired shape can be given to these polymers by extrusion Pyrolysis which involves the heating and degradation of the polymeric materials at temperatures between 250°C to 350°C without oxygen which breaks down the polymerization process and gases of respective materials used in polymerization process are released. To overcome the problem of disposal of plastic alternate methods are being found out. Production of oil out of plastic is one such method. Our project mainly focuses on effective disposal of plastic by producing oil from it. The plastic will be burnt using the process of Pyrolysis and released gases are condensed and distilled to produce oil. The oil will be experimented on Diesel engine with a view to get less emission and more efficiency.

# **Fabrication & Characterization of As Cast and Heat Treated of Aluminum Hybrid Metal Matrix Composites**

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## **Abstract**

Aluminium alloys are widely used in automobile industries and aerospace applications due to their good mechanical properties as compared with conventional metals and alloys. The low production price and better mechanical properties of the composites make them very useful for various applications in many fields. The present investigation has been focused on the development of hybrid composite involving Aluminum metal matrix reinforced with particulates of silicon carbide and graphite. The composites are fabricated using liquid metallurgy routing. The Al 2024 Hybrid composites were cast by stir casting liquid metallurgy route with a percentage of Silicon Carbide varying from 0%, 5%, 10% and 15% weight whereas the percentage of Graphite is kept constant at 2.5% wt. The cast composites were tested for hardness, wear, tensile characteristics with and without heat treatment (T6). The result indicates that there is a nominal improvement in the hardness values, wear and Tensile properties of both with and without Heat treated specimens.

## **Electrodepositing Technique for Producing Platinum Coating**

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### **Abstract**

The electrodeposition has long been used for the preparation of coatings composed of either one metal or a mixture of two or more metals in the form of an alloy. Platinum's electrochemical deposition on Pt 5Q bath stainless steel (Pt (NH<sub>3</sub>)<sub>4</sub>HPO<sub>4</sub> solution modified to pH 10.5 and temperature 550C) was investigated using cyclic voltammetry and chronoamperometry. The platinum-coated SS304 acting as a substratum in which the coatings ' structure and surface morphology were characterized by electron microscopy (SEM) scanning and X-ray diffraction (XRD). Platinum pulse electrodeposition has been engineered to produce other properties such as finer grain size, anti-tanning, lower porosity, and surface property enhancement. The finest quality was obtained from the current pulse density of 0.2 A / dm<sup>2</sup> and the duty cycle of 25 percent. Relative contrasts and performance of these coatings were investigated in this work obtained by electrodeposition DC (direct current) and electrodeposition PC (pulse coating).

**Keywords:** SEM, Cyclic voltammetry, Chronoamperometry, Pulse coating, Stainless steel.

#### DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering at Srinivas University offers undergraduate programs in B.Tech, Post Graduation program M.Tech (By Research) and Ph.D. The department has a team of highly qualified and dedicated faculty members along with highly experienced supporting staff, state-of-the-art laboratories, multimedia classrooms, digital online library facilities and a good infrastructure which provides a healthy and professional environment on par with the International standards.

#### SRINIVAS UNIVERSITY

Srinivas University, Mangaluru, is a Private Research University in Mangaluru, Karnataka, India established in 2013 by Karnataka State Act. Srinivas University is the flagship of 18 Srinivas Group of Institutions started by A. Shama Rao Foundation, Mangaluru, India, a private Charitable Trust founded in 1988 by an Eminent Chartered Accountant Sri. A. Raghavendra Rao.

A. Shama Rao Foundation has started many professional colleges in Mangalore which include Srinivas Institute of Medical Sciences and Research Center, Srinivas Institute of Dental Sciences, Srinivas Institute of Technology, Srinivas College of Pharmacy, Srinivas Institute of Nursing Sciences, A Shama Rao Nursing School, Srinivas Integrated Campus, Srinivas College of Hotel Management, Vijayalakshmi Institute of Hospitality Sciences, Srinivas First Grade College, Srinivas School of Engineering, Srinivas Institute of Management Studies, Srinivas College of Physiotherapy, Srinivas School of Business, Srinivas School of Management, Srinivas College of Education, Srinivas Institute of Social Work.

Presently, Srinivas University offers undergraduate, postgraduate, and research courses under 8 Colleges with about 80 courses. The University has made innovations in designing and starting new super speciality programmes both in UG and PG.



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