

Edition IV, Volume II 2020-21

Mechanical Engineering E-Magazine (LBRCE)



(TIER-I)



MECH PULSE

(OCT - DEC 2020)



DEPARTMENT OF MECHANICAL ENGINEERING
LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(Autonomous)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME) under Tier - I
Approved by AICTE and Permanently Affiliated to JNTUK, Kakinada

Mechanical Engineering E-Magazine (LBRCE)

MESSAGE FROM HEAD OF THE DEPARTMENT

I am very happy to inform you that the department of mechanical engineering is bringing **MECH PULSE-an e-magazine** its edition IV and volume II. The department of mechanical engineering is Accredited by **National Board of Accreditation (NBA) under Tier-I** and is started in the year 1998 with an intake of 60 students. At present the department is offering B.Tech Mechanical Engineering with an intake of 120 students and M.Tech – Thermal Engineering with an intake of 18 students. The department has thirteen state of art laboratories worth of 2.8 crores, with advanced computing facilities, software and research equipment. Advanced **Research Laboratories** in the area of **Cognitive Science, Material Testing, Tribology and Thermal Engineering** are available. Sophisticated **ANSYS Skill Development Centre** with 110 users of ANSYS 18.1 and **Dassult 3D Experience centre** (in association with APSSDC) is available. The department has 37 faculty members with 9 Doctoral degrees. Fourteen faculty are actively pursuing for their Ph.D in various universities and nine research scholars are working for their doctoral under the department faculty. The department faculty constantly upgrade their knowledge in the area of their domain by attending various Faculty Development Programs, workshops, seminars etc. The faculty are actively engaged in their research work and are active in publishing papers in journals and conferences.

VISION OF THE DEPARTMENT

- To impart knowledge in Mechanical Engineering with global perspectives for the graduates to serve the society and industry.

MISSION OF THE DEPARTMENT

- To enable the graduates technically sound with the state- of- the –art curriculum and innovative teaching methods
- To provide training programs that bridge the gap between academia and industry
- To create a conducive environment and facilities to improve overall personality development of the graduates
- To make the graduates aware of role and responsibilities of an engineer in society.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.

PEO2: To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.

PEO3: To develop inquisitiveness towards good communication and lifelong learning.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: To apply the principles of thermal sciences to design and develop various thermal systems.

PSO2: To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.

PSO3: To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

ONGOING RESEARCH PROJECTS

S.No.	Name of the Faculty	Title of the Project	Funding Agency	Amount Sanctioned	Sanctioned Year
1.	Dr.K.Appa Rao	Experimental Investigation on Homogeneous Charge Compression Ignition Engine	UGC	1,55,000	2018
2.	Dr.N.Sunil Naik	Evaluation of engine parameters affecting the performance of enzymatic transesterification process using test fuel blends	DST/SERB/EEQ	22,81,000	2019
3.	Dr.P.Vijay Kumar	Prerana scheme	AICTE	4,80,000	2019
4.	Dr.K.Murahari	Frontier of 3D Printing Technology & its Industrial Applications (Sponsored FDP)	AICTE	4,77,833	2020

CONFERENCES ATTENDED BY THE FACULTY

- Dr.Murahari Kolli, “Machinability Studies of Lead Induced Ti-6al-4v Alloy Using Taguchi Technique on WEDM Process” in 11th International Conference on Materials Processing and Characterization (ICMPC -2020) at Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad during 15.12.2020 to 17.12.2020.
- Dr.V.Dhana Raju, S.Rami Reddy “Effect of Nanoparticles as Fuel Catalyst on The Performance and Emission Characteristics of The Diesel Engine Powered With Mango Seed Biodiesel Blend” in First International Conference on Future Technologies In Manufacturing, Automation, Design & Energy in NIT, Puducherry, from 28.12.2020 to 30.12.2020.
- Dr.N.Sunil Naik, A.Dhanunjay Kumar “Optimization of EDM Process Parameters on Machining Characteristics of Sic And Graphene Reinforced Al 6061-T6nano-Composites” in International E-Conference on Industry 4.0 - Technologies in Civil And Mechanical Engineering-Ici4tcme-2020 in VVIT, Guntur from 04.12.2020 to 05.12.2020.
- D.Mallikharjuna Rao, “Impact of Graphene Nanoparticles Addition to Jatropha Biodiesel Blend on the Performance and Emission Characteristics of a Diesel Engine” in First International Conference on Future Technologies In Manufacturing, Automation, Design & Energy in NIT, Puducherry, from 28.12.2020 to 30.12.2020.

JOURNALS PUBLISHED BY THE FACULTY

Dr.P.Vijay Kumar,

Professor

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Title of the Paper: Experimental and CFD Analysis of Heat Transfer Rate in Multi Air Jet Impingement over a Flat Plate and Pin-Fin Heat Sink

Name of the Journal: International Journal of Innovative Technology and Exploring Engineering (IJITEE)

Co-Authors: K.Lakshmi Prasad

Publication on: October 2020

ISSN No: 2278-3075

Doi:

Abstract: In this paper reports the results of investigation of heat transfer performance of in compression air jet impinging of heated surface over a flat plate & pin-fin heat sink. To mimic the computer processor of flat plate and pin fin dimensions are 120mm*75mm and pin height is 5cm and fin radius is 1cm and L/d ratios are 5,10,15 respectively. By using this simulation in Ansys fluent software to perform the turbulent jet impingement on a surface. The bottom surface of the plate is supply constant heat flux and top surface of the plate is cooled by an impingement jet of air. It has two equations are used k-w model and shear stress transport to handle the turbulent jet. The result of flat plate heat sink is compare the Experimental and simulation is higher at 0.89% of experimental to compare numerical and Nusselt is higher at 3.35% of numerical to compare the experimental and heat transfer coefficient is higher at 4.51% of numerical to compare the Experimental and result of pin fin heat sink is compare the Experimental and numerical is higher at 0.23% of experimental to compare the numerical and Nusselt number is higher at 0.71% of numerical to compare the experimental and heat transfer coefficient is higher at 0.88% of numerical to compare the experimental. The effect of L/d ratios of jet impingement over a flat plate and pin fin heat sink on the heat transfer performance of the heated surface of investigated

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Experimental Study of Heat Transfer Rate in Single and Series Cross Flow Heat Exchanger using Matlab Coding

Name of the Journal: International Journal of Engineering and Advanced Technology (IJEAT)

Co-Authors: Dr.P.Ravindra Kumar, K.Srinivasa Rao

Publication on: October, 2020

ISSN No: 2249-8958

Doi: 10.35940/ijeat.A1836.1010120

Abstract: The present study investigates the heat transfer rate and effectiveness of cross flow heat exchanger by varying velocity and mass flow rate of the cold and hot fluids. The velocity of the cold fluid i.e. air varying from 15m/s to 30m/s (with an intermediate step of 20m/s and 25m/s) whereas the mass flow rate of hot fluid i.e. water is taken as 35lit/hr and 84lit/hr. The logarithmic mean temperature difference (LMTD) method is used to find the heat transfer rate. In the present work the effectiveness and heat transfer rate were compared between the single and series cross flow heat exchangers. The result shows an average increase of 47.14% and 59.59% of heat transfer rate analogous to mass flow rate of 84lit/hr and 35lit/hr.

JOURNALS PUBLISHED BY THE FACULTY

Dr.V.Dhana Raju,

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Title of the Paper: Influence of Al_2O_3 nano additives in ternary fuel blends operated in a single cycliner diesel engine: Perfomance, combustion and emission characteristics

Name of the Journal: Energy (Elseveir)

Co-Authors:

Publication on: october 2020

ISSN No:

Doi:

Abstract: The present work is dedicated to the experimental analysis on the influence of fuel borne additives on ternary fuel blend operated in a single cylinder DI diesel engine. Alumina (Al_2O_3) nanoparticles were chosen as fuel additives at dosing levels of 10 ppm, 20 ppm and 30 ppm respectively and the ternary fuel (TF) is prepared by blending 70% diesel, 20% Jatropha biodiesel and 10% ethanol. Performance characteristics like brake thermal efficiency (BTE) and brake specific energy consumption (BSEC), emission characteristics like HC, CO, NO_x and smoke along with combustion characteristics like cylinder pressure, HRR (Heat release rate) and CHRR (Cumulative heat release rate) were considered for analysis. Based on experimentation, it is observed that, TF blended with 20 ppm alumina nano additive (TF20) resulted in higher BTE and lowered BSEC by 7.8% and 4.93%, lowered HC, CO, NO_x and smoke emissions by 5.69%, 11.24%, 9.39% and 6.48% in comparison with TF. Moreover, TF20 resulted in higher cylinder pressure, HRR and CHRR of about 72.67 bar, 76.22 J/oCA and 1171.1 J respectively which are higher than diesel and TF. Hence, it is concluded that addition of 20 ppm alumina nano additive in TF can enhance the engine performance and combustion as well as lower the exhaust pollutants simultaneously.

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Effect of Sr@ZnO nanoparticles and *Ricinus communis* biodiesel-diesel fuel blends on modified CRDI diesel engine characteristics

Name of the Journal: Energy (Elsevier)

Co-Authors:

Publication on: October 2020

ISSN No:

Doi: <https://doi.org/10.1016/j.energy.2020.119094>

Abstract: The current study aims to evaluate the performance and emission characteristics of a modified common rail direct injection (CRDI) diesel engine fueled by *Ricinus communis* biodiesel (RCME20), diesel (80%), and their blends with strontium-zinc oxide (Sr@ZnO) nanoparticle additives. The Sr@ZnO nanoparticles were synthesized using aqueous precipitation of zinc acetate dehydrate and strontium nitrate. Several characterization tests were performed to study the morphology and content of synthesized Sr@ZnO nanoparticles. The Sr@ZnO nanoparticles were steadily blended with RCME20-diesel fuel blend in mass fractions of 30, 60 and 90 ppm using a magnetic stirrer and ultrasonication process. For a long term stability of nanoparticles, Cetyltrimethylammonium bromide (CTAB) surfactant was added. The physicochemical properties of the fuel blends were measured using ASTM standards. The CRDI engine was operated at two compression ratios 17.5 and 19.5, 1000 bar injection pressure, 23.5° BTDC injection timing and constant speed. For enhanced swirl and turbulence, and improved spray quality lateral swirl combustion chamber and 6-hole fuel injector were used. The compression ratio of 19.5 and 60 ppm of Sr@ZnO nano-additives showed overall enhancement in engine characteristics compared to RCME20 fuel. The engine characteristics such as BTE, HRR and cylinder pressure increased by 20.83%, 24.35% and 9.55%, and BSFC, ID, CD, smoke, CO, HC and CO₂ reduced by 20.07%, 20.64%, 14.5%, 27.90%, 47.63%, 26.81%, and 34.9%, while slight increase in NO_x for all nanofuel blends was observed.

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Experimental Analysis of Higher Alcohols Based Ternary Biodiesel Blends in CI Engine Parameters through Multivariate and Desirability Approaches

Name of the Journal: Biomass Conversion and Biorefinery (SCI)

Co-Authors:

Publication on: October 2020

ISSN No:

Doi:

Abstract: The present work has enabled to aspire the enhancement of palm biodiesel viability for compression ignition (CI) engine applications using reformulation strategy by the addition of higher alcohols. In this work, 20% and 30% of 1-decanol and n-hexanol were used for ternary blend preparation along with palm biodiesel concentration as 20–30% and 50% diesel fuels for combustion, emission, and performance behaviour investigation in CI engine. Furthermore, the experimental results were also compared with 100% palm biodiesel (P100) and pure diesel (D100) and a binary blend of D50B50 fuels. The experimental study has revealed that the presence of higher alcohols in the ternary blends has improved the cylinder pressure and heat release rate whereas the same trend was not evident in binary biodiesel blend. All the ternary blends of higher alcohols-biodiesel and diesels have shown higher brake thermal efficiency and reduction in brake-specific fuel consumption. At the same time, decanol and hexanol addition in the palm biodiesel-diesel blends has favoured in all exhaust emission reductions with slight exemption in NO_x emission. The experimental results are optimized through multivariate and desirability analyses for identifying the effective composition of blend. Multivariate analysis has revealed that the higher alcohol proposition in the ternary blend was more influential than the type of higher alcohol. Furthermore, the desirability study has also validated the prescribed proportion with the maximum error of 6.17% for D50P22DC28 and 4.84% for D50P26HE24. Finally, the research concludes that decanol would be the preferable choice for ternary blend preparation than hexanol due to its overall better performance

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Dry Sliding Tribological Behaviour of Al7010/ B4C/BN Hybride Metal Matrix Nano composites Prepared by Ultrasonic Assisted Stir Casting

Name of the Journal: Transaction of the Indian Institute of Metals

Co-Authors:

Publication on: November 2020

ISSN No:

Doi: [10.1007/s12666-020-02128-y](https://doi.org/10.1007/s12666-020-02128-y)

Abstract: In the present investigation, Al7010/B4C/BN hybrid metal matrix nanocomposites with varying weight percents (wt%) of 0, 0.5, 1.0, 1.5, 2.0 and 2.5 of B4C and BN nanoparticles were prepared by ultrasonic-assisted stir casting technique. For the prepared composites, the microhardness and the tribological characteristics were reported. The wear behavior was determined under normal loads of 10, 20, 30 and 40 N and at sliding speeds of 0.5, 1.0 and 1.5 m/s, respectively. The results showed an increase in wear resistance and decrease in friction coefficient with the addition of the nanoparticles. The wear rate and friction coefficient increased with increase in normal load and sliding speed. The scanning electron microscope (SEM) images revealed uniform dispersion of the reinforcement particles in the composite. The wear specimens showed adhesion and plowing behavior at lower loads and delamination at higher load

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Influence of rock dust reinforcement on mechanical properties of Al composite using friction stir processing

Name of the Journal: Australian Journal of Mechanical Engineering (ESCI)

Co-Authors:

Publication on: November 2020

ISSN No:

Doi: doi.org/10.1080/14484846.2020.1842299

Abstract: Aluminium metal matrix composites (AMMCs) are attractive and effective materials due to their tailored properties for outstanding applications, like high specific strength, lightweight, high specific stiffness, excellent wear resistance, corrosion resistance and high elastic modulus than the base metal matrix. These materials are widely used in aerospace, automobile, marine, mining and mechanical structural applications. In the present study, rock dust was considered as reinforcement particles in various wt % (2, 4, 6, 8 and 10) in aluminium material. Rock dust is a by-product of the crushing processes of rocks in the production of gravel aggregates. The purpose of this investigation is to identify the influence of rock dust reinforcements on mechanical and wear properties of aluminium-based surface composites fabricated through the Friction Stir Processing (FSP). Traverse speed, rotational speed and tool tilt angle are fixed input parameters. From the experimental results it was observed that in the fabricated composite, rock dust addition to Al material gives better wear-resistant characteristics. Enhanced trends occurred in Impact strength and micro-hardness values due to the addition of reinforcements to the aluminium material..

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Effect of split fuel injection strategies on the diverse characteristics of CRDI diesel engine operated with tamarind biodiesel

Name of the Journal: Energy Sources, Part A: Recovery, Utilization, and Environmental Effects

Co-Authors:

Publication on:

ISSN No:

Doi: [//doi.org/10.1080/15567036.2020.1856973](https://doi.org/10.1080/15567036.2020.1856973)

Abstract: The demand for petroleum fuels has been rapidly increasing owing to the wide use of automobiles and other agricultural engines which prefer diesel as a major fossil fuel. This research work investigates the effect of change in the fuel injection strategies on CRDI engine under various loads with tamarind seed methyl ester (TSME) 20% biodiesel blend. Initially, the diesel fuel is injected at 600 bar with 30% pilot injection (P.I) and 100% main injection (M. I). Later, TSME20 is injected at the same pressure with the two injection strategies mentioned. This study discloses that the BTE has boosted by 4.79% with 30% pilot injection than 100% main injection for the tested biodiesel. Further, TSME20 biodiesel at 30% pilot injection has shown significant reduction of hydrocarbons by 12.16%, carbon monoxide by 32.14% and smoke emissions by 19.71% when compared with 100% diesel main injection at peak load conditions. However, the pilot injection for the tested fuels has exposed slight enhancement in NOX emissions, which may be reduced by exhaust gas recirculation (EGR). Hence, the use of 30% pilot injection of TSME20 biodiesel is recommended for diesel engines as an alternative fuel which has improved performance along with reduced emissions.

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Damage Assessment on Beam-Like Structures through Mode Shapes and its Curvatures

Name of the Journal: International Journal of Disaster Recovery and Business Continuity(ESCI)

Co-Authors:

Publication on: November 2020

ISSN No.:2005-4289

Doi:

Abstract: During the most recent decades an extraordinary assortment of techniques are continuously proposed for assessment of damage by utilizing the structural modal qualities, in any case, the greater part of them necessitate modal information of the healthy structure as a source. Right now in this work, appropriateness of the mode shapes and its curvatures are decided the damage location with the help of modal information like mode shapes of damaged and healthy beam-like structures. Sometimes it is highly impossible to obtain healthy state structural modal data, so in this view; a new method is proposed to recognize the damage with the help of square of mode shape curvature magnitude of the damaged beams only. To build up the above techniques aluminium beams are considered without crack and with a crack at various locations and tested by using the experimental modal analysis (EMA). The experimental resonant frequencies along with its mode shapes are obtained and validated these parameters obtained by finite element modal analysis (FEMA). Mode shape curvatures are estimated with the help of complete information of mode shapes by central difference approximation method. Keywords: Damage identification, beam-like structures, mode shape, mode shape curvature, mode shape based damage detection techniques

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Fatigue and Wear Behaviour of Ti-6Al-4V Implan Alloy

Name of the Journal: Indian Foundry Journal

Co-Authors: Dr.S.Pichi Reddy

Publication on: November 2020

ISSN No: 0379-5446

Doi: 10.1007/s12666-012-0147-4

Abstract: Titanium alloys are extensively used in various fields of engineering, medicine, aerospace, marine due to their excellent mechanical properties. Their usage is more pronounced today in the field of biomedical implants due to superior biocompatibility, corrosive resistance and high strength. However, titanium alloys have poor wear resistance due to high coefficient of friction. Poor abrasive wear resistance results in the formation of wear debris at the implant area causing toxicity, inflammation and pain. Surface treatment of the implant alloy through heat treatment, application of protective coatings and introduction of compressive residual stresses by shotpeening are some of the methods to mitigate wear of the implant alloy. In this work Ti-6Al-4V implant alloy is treated under various conditions of heat treatment and shotpeening operations on a pin on disc wear testing machine. Scanning electron micrograph along with energy dispersive spectrometry analysis is done to authenticate the experimental results obtained during the wear testing procedure

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Computational Performance Analysis of an Indirect Evaporative Cooler (IDEC) Unit

Name of the Journal: TEST Engineering and Management

Co-Authors: K.V. Viswanadh

Publication on: july- aug 2020

ISSN No:

Doi:

Abstract:

JOURNALS PUBLISHED BY THE FACULTY

Dr.V.Dhanaraju,

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Title of the Paper: Experimental assessment of performance, combustion and emission characteristics of diesel fuelled with lemon peel oil

Name of the Journal: International Journal of Ambient Energy

Co-Authors:

Publication on: December 2020

ISSN No:

Doi:

Abstract: The major source of fuel for compression ignition engine is diesel. Because of its non-renewable nature, unavailability, more pollution nature, importing charges of diesel is becoming costlier nowadays. So, there is a need for a new biofuel which is economical, renewable and gives better performance over diesel. In this proposed work, lemon peel oil is selected as an alternative fuel for diesel engine application because of its more extensive available nature, easy extraction process and equivalent calorific value as diesel with very low viscosity. Various fuel blends are prepared using lemon peel oil such as 10%, 20% and 30% on a volume basis and are tested in diesel engines. Test results indicate that significant reductions of engine tailpipe emissions for the 20% lemon peel biodiesel blend by 25%, 25.6% and 15.44% for the CO, HC and smoke, respectively, when compared to diesel. However, there is a slight increase in NOX emissions.

JOURNALS PUBLISHED BY THE FACULTY

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Title of the Paper: Improvement of Weld Joint Strength by Applying Random Vibrations Along With External Magnetic Field

Name of the Journal: IOP Conference Series: Materials Science and Engineering

Co-Authors:

Publication on: December 2020

ISSN No:

Doi: [10.1088/1757-899X/998/1/012035](https://doi.org/10.1088/1757-899X/998/1/012035)

Abstract: Welding is a metal joining process induces high residual stresses. These are strongly influencing the mechanical properties of weldment. In earlier days heat treatment and shot peening techniques were used to relieve these stresses. Due to the time consuming of these processes, in this research work we have applied random vibrations to relieve the residual stresses to improve mechanical properties. Along with that, welding arc may get affected by magnetic field during welding. This leads to arc instability which is responsible for welding defects like lack of fusion, porosity. These reduce the quality and strength of weld. To overcome this, arc spattering with external magnetic field need to be reduced. In this research work, a setup has been designed for vibration assisted welding along with external magnetic field set up to improve the mechanical properties of Mild Steel weld joints by means of hardness and ultimate tensile strength. Welding had been performed with and without these setups. After performing welding work pieces have been tested both welding conditions and results have been compared.

BOOKS/CHAPTERS PUBLISHED BY THE FACULTY

Dr.P.Vijay Kumar,

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Title of the Paper: Phase change materials for thermal management and energy conservation in buildings

Name of the Journal: Lambert academic publishers

Co-Authors: Dr.K.Appa Rao

Publication on: November 2020

ISBN No: 978-620-3-02881-2

Doi: [10.1088/1757-899X/998/1/012035](https://doi.org/10.1088/1757-899X/998/1/012035)

Abstract: The ever growing demand for energy and the diminishing reserves of fossil fuel reserves have let the researchers to explore the new ways for energy sources and energy conservation techniques. A phase change material based technology for thermal management in buildings has emerged as a promising one and efficient method with its large capacity to store and retrieve thermal energy for both cooling and heating applications. The technology on the use of PCMs for diverse fields of engineering has been gaining momentum and getting attraction from researchers, manufacturers in different dimensions. There are passive and active methods of using the PCM for buildings and other applications. A phase change material wallboard can be used on the walls, roof of a building for reducing the excess temperatures and maintain comfort conditions. The distinctive characteristics i.e., eco-friendly nature and the high energy storing capacity that leads to energy savings and conservation in the selected application has been the main source of inspiration in the use of PCM based technology. It has been taking new dimensions and surely take a lead role in near future with the advancement of technology.

STUDENTS PROJECT

Title of the Project: DESIGN & FABRICATION OF POWER HUMP

Project Members:

16761A0377

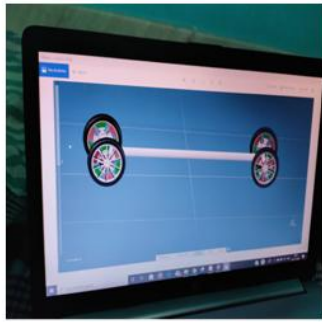
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17765A0320

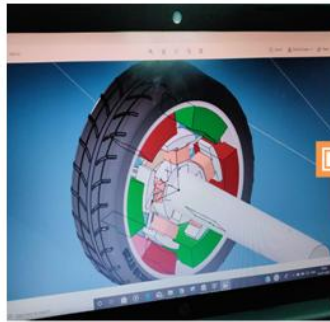
16761A0373

Project Supervisor: MR. A. NARESH KUMAR

Abstract:



Axle Modelling



Wheel Modelling



Pictographic view of Axle taken



Arrangement on Two Rear Wheels and ready for final check for voltage Generation



Casing Arrangement



Coils arrangement on Wheel

STUDENTS PROJECT

Title of the Project: DESIGN AND ANALYSIS OF AN ELECTRIC CAR

Project Members:

16761A03A1

16761A03A6

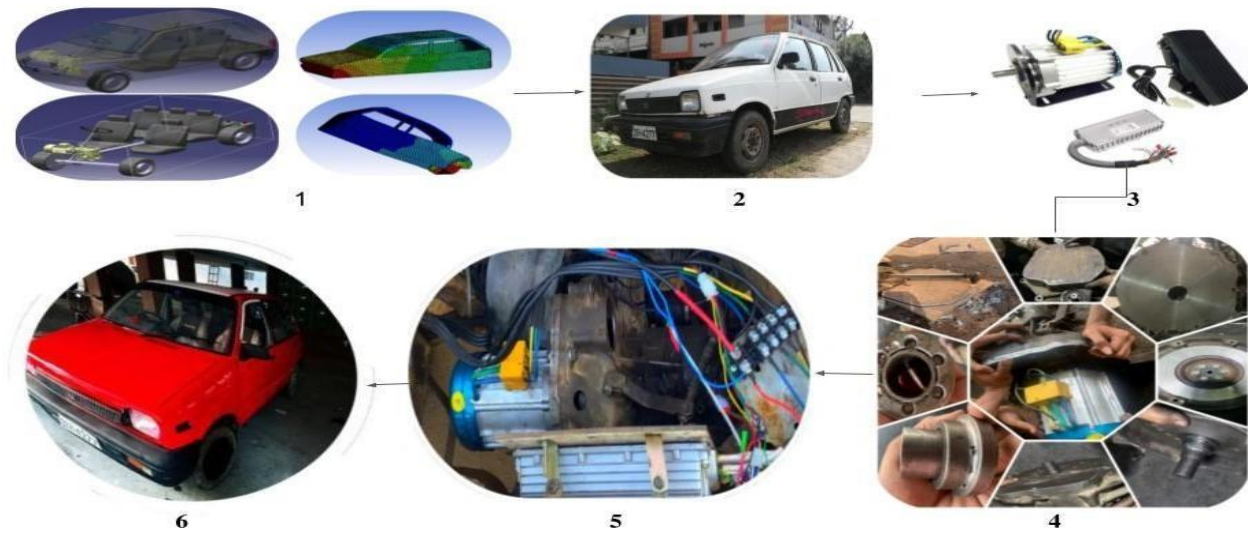
16761A03A3

16761A0387

Project Supervisor: MR. A. DHNANJAY KUMAR

Abstract:

An electric car is an automobile that is propelled by one or more electric motors using energy stored in rechargeable batteries. Gasoline cars are proved to be the efficient ones in the present market but the problem is that the gasoline combusts,¹ it releases the end product of carbondioxide, carbon monoxide and nitrogen oxides ,which contribute to the climate change negatively.so to counter this effect ,the alternative is to replace gasoline engines into electric motors in vehicles. Electric vehicles have been identified as being a key technology in reducing emissions in the automobile sector. The focus of the project is to convert a gasoline vehicle in electric one. An IC engine will be replaced with BLDC(Brush less Direct Current) motor with the inclusion of controller, battery, switching, gear system etc. the main goal will be to increase the efficiency, reduce emissions, reduce the vehicle cost so as to make it available to all the sections of the society. The assessment of energy efficiency and cost factor will be evaluated in the project.



STUDENTS PROJECT

Title of the Project: INFLUENCE OF PALMYRA CUTTING OIL WITH MQL SYSTEM ON MACHINABILITY CHARACTERISTICS OF PH17-4 STEEL

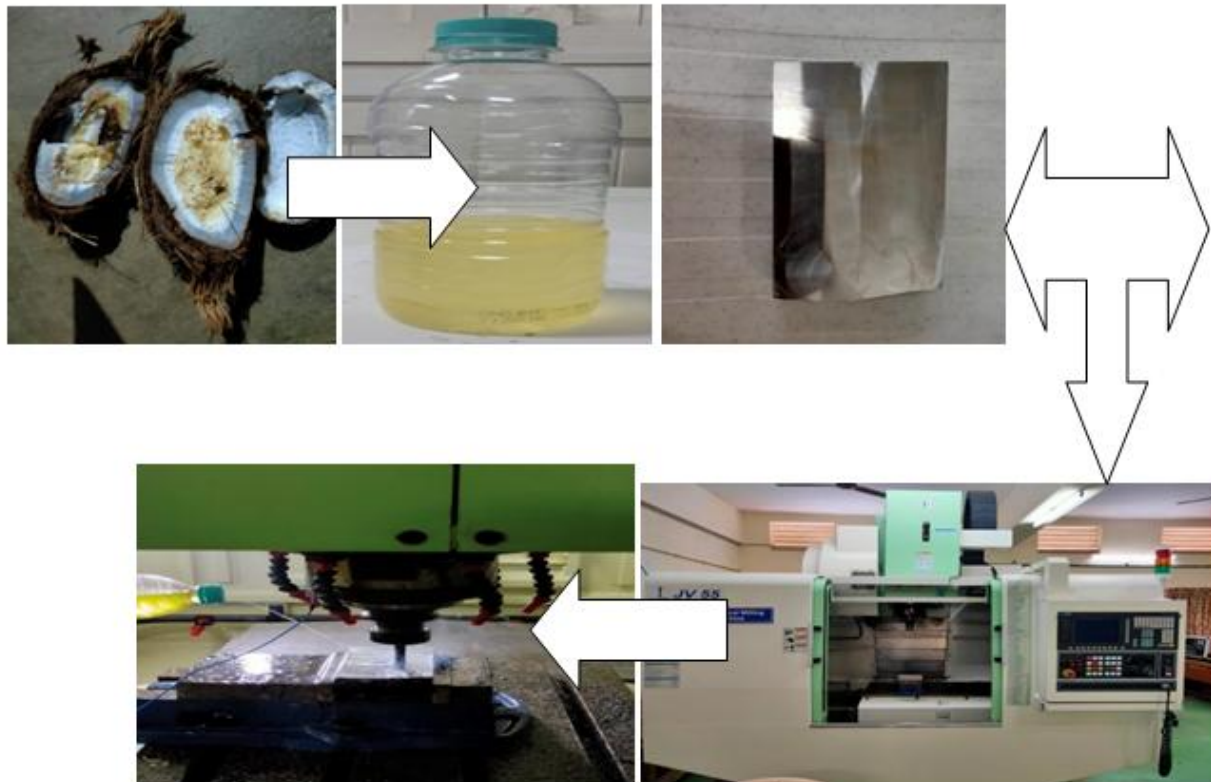
Project Members:

- 16761A0361
- 16761A0378
- 16761A03A5
- 16761A03A2

Project Supervisor: DR. K. MURAHARI

Abstract:

Metal cutting industries use cutting fluids to reduce temperatures, forces and friction in machining. However, the application of cutting fluids has been always debatable due to their impact on workers health. With the increase in awareness on sustainable practices, several alternatives like Minimum Quantity Lubrication (MQL) or replacing the convention form of cutting fluid application. The present work to investigate the efficacy of different cutting fluids in MQL, in terms of both machining performance and sustainability characteristics were considered. The cutting fluids will be prepared and their properties will be evaluated. The measured machining performance parameters like material removal rate (MRR), surface roughness (SR) and tool wear rate (TWR). Further to evaluate the surface topography of machined samples at optimum performance condition. In this study statistical approach was adopted to conduct the experiments.



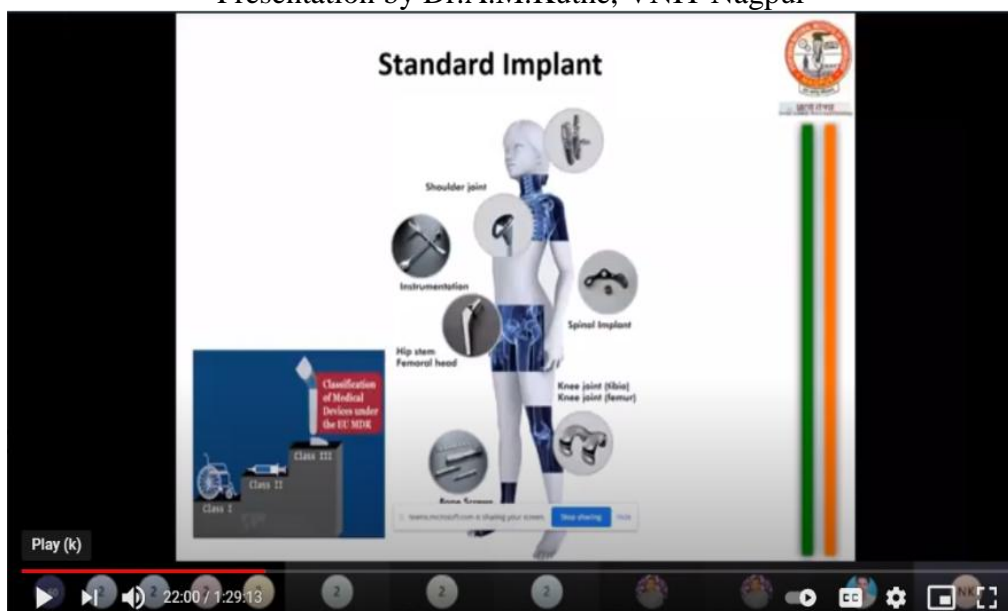
EVENTS ORGANIZED BY THE DEPARTMENT

ONLINE FACULTY DEVELOPMENT PROGRAM FRONTIER OF 3D PRINTING TECHNOLOGY AND ITS INDUSTRIAL APPLICATIONS (PHASE-I)

The Dept. of Mechanical Engineering, organized a AICTE sponsored online faculty development program on “Frontier of 3D printing technology and its industrial applications (Phase-I)” through online from 07/12/2020 to 19/12/2020 by various faculty from reputed institutions. Dr.Murahari Kolli, J.Subba Reddy, K.V.Viswanadh coordinated the event.



Presentation by Dr.A.M.Kuthe, VNIT Nagpur



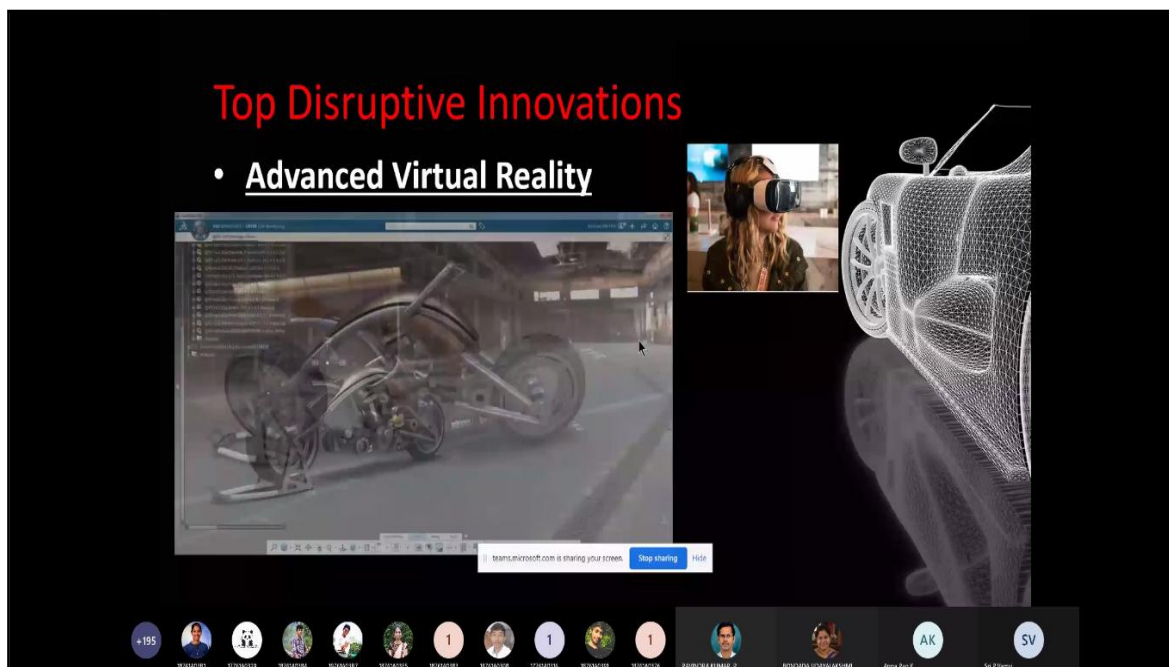
Standard implant in 3D printing

WEBINARS

- The Dept. of Mechanical Engineering organized a online webinar on “Desruptive Technologies – Are we heading towards that” on 03/10/2020 by P.Mohan, Consultant and Expert in Design Analysis of Electric Vehicle, Pune. Dr.P.Ravindra Kumar, Mr. K.V.Viswanadh coordinated the event.



Presentation on electric vehicles



Presentation by P.Mohan

SUMMARY OF COLLOQUIMS ORGANIZED

S. No	Name of The Faculty	Name of the Topic	Date
1.	Dr.K.Dilip Kumar	Energy and Exergy Analyses of a Parabolic Trough Collector Operated with Nano fluids for Medium and High Temperature Applications	09.10.2020
2.	B.Chaitanya	The influence of cognitive and visual distraction on driving errors among young drivers leading to road accidents.	21.10.2020
3.	Dr.K.Murahari	Introduction to Minitab software 18.0	10.11.2020
4.	Dr.V.Dhana Raju	Modern tools for the effective research in CI engines	27.11.2020
5.	Dr.N.Sunil Naik	Synthesis of green catalysts and its application in biodiesel production	10.12.2020
6.	S.Srinivasa Reddy (Jr)	Introduction to Machine Design	23.12.2020

FDP's/STTP's/STC's/WORKSHOP's ATTENDED BY FACULTY

1. Dr.P.Ravindra Kumar, has participated in a short term training program on “Enhancing Research and Development through Project based learning to achieve outcome based education in engineering” organized by Sri Krishna College of Technology, Coimbatore from 22.10.2020 to 29.10.2020.
2. Dr.P.Ravindra Kumar, has participated in a faculty development program on “Electric Vehicles” organized by NIT, Mizoram from 10.11.2020 to 14.11.2020.
3. Dr.P.Ravindra Kumar, has participated in a faculty development program on “Tools for Effective Research in Thermal Engineering” organized by VNR Vignana jyothi Institute of Engineering and Technology, Hyderabad from 23.11.2020 to 27.11.2020.
4. Dr.P.Vijay Kumar, has participated in a faculty development program on “Renewable Energy Intervention in Industry, Commercial and Domestic Application” organized by RGM College of Engineering and Technology, Nandyal from 14.12.2020 to 26.12.2020.
5. J.Subba Reddy, has participated in a faculty development program on “Application of Artificial Intelligence and Machine Learning in Digital Manufacturing” organized by GIET University, Gunupur, Odisha from 02.11.2020 to 16.11.2020.
6. J.Subba Reddy, has participated in a faculty development program on “Gender Equality and Violence against Women during COVID-19” organized by NIT, Jalandhar from 09.10.2020 to 13.10.2020.
7. Dr.V.Dhana Raju, Dept. of Mechanical Engineering has participated in a faculty development program on “Advances in Engine Combustion and Emission diagnostics” organized by NIT Andhra Pradesh during 05.10.2020 to 09.10.2020.

8. Dr.V.Dhana Raju, has participated in a faculty development program on “Tools for Effective Research in Thermal Engineering” organized by VNR Vignana jyothi Institute of Engineering and Technology, Hyderabad from 23.11.2020 to 27.11.2020.
9. Dr.Murahari Kolli, Dept. of Mechanical Engineering has participated in a faculty development program on “Additive Manufacturing for Aerospace and medical Applications” organized by Sri Vishnu Engineering college for women, Bhimavaram during 26.10.2020 to 31.10.2020.
10. Dr.Murahari Kolli, Dept. of Mechanical Engineering has participated in a faculty development program on “Research Methodologies and Statistical Data Analysis” organized by Chaitanya Bharathi Institute of Technology, Hyderabad during 16.11.2020 to 28.11.2020.
11. Dr.N.Sunil Naik, Dept. of Mechanical Engineering has participated in a faculty development program on “Advances in Engine Combustion and Emission diagnostics” organized by NIT Andhra Pradesh during 05.10.2020 to 09.10.2020.
12. Dr.N.Sunil Naik, has participated in a faculty development program on “Tools for Effective Research in Thermal Engineering” organized by VNR Vignana jyothi Institute of Engineering and Technology, Hyderabad from 23.11.2020 to 27.11.2020.
13. B.Sudheer Kumar, has participated in a faculty development program on “Advances in Engine Combustion and Emission diagnostics” organized by NIT Andhra Pradesh during 05.10.2020 to 09.10.2020.
14. S.Rami Reddy, has participated in a faculty development program on “Advances in Engine Combustion and Emission diagnostics” organized by NIT Andhra Pradesh during 05.10.2020 to 09.10.2020.
15. A.Nageswararao, has participated in a faculty development program on “Robotics” organized by Motilal Nehru National Institute of Technology, Allahabad during 02.11.2020 to 06.11.2020.
16. A.Nageswararao, has participated in a faculty development program on “IoT Based Manufacturing and Design - Challenges and Opportunity” organized by Viswajyothi College of Engineering and Technology, Chennai during 23.11.2020 to 28.11.2020.
17. Mallikharjuna Rao.D, Dept. of Mechanical Engineering has participated in a short term training program on “Intellectual Property For Engineering & Scientists” organized by CMR Institute of Technology, Bengaluru during 23.11.2020 to 28.11.2020.
18. K.Venkateswara Reddy, participated in a faculty development program on “Professional Morals, Work Ethics & Accountability for Teachers in Technical Education” organized by V.R.Siddhartha Engineering College, Vijayawada during 19-10-2020 to 31-10-2020.
19. K.Venkateswara Reddy, participated in a faculty development program on “FEM/CFD” organized by Lakshmi Narain College of Technology, Bhopal during 14-10-2020 to 18-10-2020.

20. K.Venkateswara Reddy, [has participated in a faculty development program on “Material Science & Nano Materials”](#) organized by Aurora's Degree & PG College, Hyderabad during 15-10-2020 to 16-10-2020.
21. K.Venkateswara Reddy, [participated in a faculty development program on “3D Printing & Design”](#) organized by Maharshi Dayanand University, Rohtak, Haryana during 23-11-2020 to 27-11-2020.
22. K.Venkateswara Reddy, [participated in a faculty development program on “Green Technology & Sustainability Engineering”](#) organized by NIT Raipur during 08-12-2020 to 12-12-2020.
23. K.Venkateswara Reddy, [participated in a short term training program on “Effective Engineering Teaching Practices”](#) organized by PVP Siddhartha Institute of Technology, Vijayawada during 23-12-2020 to 28-12-2020.
24. V.Venkatrami Reddy, [has participated in a short term training program on “Enhancing Research and Development through Project Based Learning to Achieve Outcome Based Education in Engineering”](#) organized by Sri Krishna College of Technology, Coimbatore during 22-10-2020 to 29-10-2020.
25. V.Venkatrami Reddy, [has participated in a short term training program on “Multi disciplinary Competency Training for Mechanical Engineers”](#) organized by Sri Krishna College of Technology, Coimbatore during 02-11-2020 to 07-11-2020.
26. V.Venkatrami Reddy, [has participated in a short term training program on “Advanced Manufacturing and Materials”](#) organized by JSS Academy of Technical Education, Noida during 23-11-2020 to 28-11-2020.
27. V.Venkatrami Reddy, [has participated in a short term training program on “Exergy and Exergoeconomic Evaluation of Thermal Power Plants”](#) organized by Pragathi Engineering College, Surampalem during 21-12-2020 to 26-12-2020.
28. K.Sai Babu, [participated in a faculty development program on “Material Science & Nano Materials”](#) organized by Aurora's Degree & PG College, Hyderabad during 15-10-2020 to 16-10-2020.
29. K.Srinivasa Rao, [participated in a faculty development program on “Tools for Effective Research in Thermal Engineering”](#) organized by VNR Vignana jyothi Institute of Engineering and Technology, Hyderabad from 23.11.2020 to 27.11.2020.
30. K.Srinivasa Rao, [participated in a faculty development program on “Ansys CFD - Hands on Workshop”](#) organized by S.R. Institute of Technology, Ananthapuramu during 14-12-2020 to 19-12-2020.
31. B.Dyva Issac Prem Kumar, [participated in a faculty development program on “Material Science & Nano Materials”](#) organized by Aurora's Degree & PG College, Hyderabad during 15-10-2020 to 16-10-2020.

32. B.Dyva Issac Prem Kumar, participated in a faculty development program on “Emerging Trends in Thermal, Design & Manufacturing (ETDM-2020)” organized by Madan Mohan Malaviya University of Technology, Gorakhpur during 26-11-2020 to 30-11-2020.
33. B.Dyva Issac Prem Kumar, participated in a short term training program on “Nanotechnology and Functional Materials (NTFM-Phase-IV)” organized by S V College of Engineering, Tirupati during 02-11-2020 to 07-11-2020.
34. B.Dyva Issac Prem Kumar, participated in a faculty development program on “Renewable Energy” organized by Poornima college of engineering, Jaipur during 14-12-2020 to 18-12-2020.
35. B.Dyva Issac Prem Kumar, participated in a short term training program on “Latest Advancements of metamaterials in wireless applications” organized by B V Raju Institute of Technology, Narasapur, Telangana during 12-12-2020 to 17-12-2020.
36. B.Dyva Issac Prem Kumar, participated in a short term training program on “Advanced manufacturing and materials” organized by JSS Academy of technical education, Noida during 07-12-2020 to 12-12-2020.
37. S.Uma Maheswara Reddy, participated in a faculty development program on “Ansys CFD - Hands on Workshop” organized by S.R. Institute of Technology, Ananthapuramu during 14-12-2020 to 19-12-2020.
38. The following are the list of faculty participated in AICTE sponsored online faculty development program on “Frontier of 3D Printing Technology and its Industrial Applications (Phase-I)” organized by Lakireddy Bali Reddy College of Engineering, Mylavaram from 07.12.2020 to 19.12.2020.

S.No.	Name of the faculty	Designation
1.	Dr.P.Ravindra Kumar	Professor
2.	S.Srinivasa Reddy	Associate Professor
3.	Jonnala Subba Reddy	Associate Professor
4.	B.Chaitanya	Associate Professor
5.	Dr.V.Dhana Raju	Associate Professor
6.	Dr.N.Sunil Naik	Associate Professor
7.	S.Srinivasa Reddy (Jr)	Sr.Assistant Professor
8.	Ch.Siva Sankara Babu	Sr.Assistant Professor
9.	K.V.Viswanadh	Sr.Assistant Professor
10.	B.Sudheer Kumar	Sr.Assistant Professor
11.	S.Rami Reddy	Assistant Professor
12.	A.Nageswara Rao	Assistant Professor
13.	K.Lakshmi Prasad	Assistant Professor
14.	V.Sankararao	Assistant Professor
15.	B.Udaya Lakshmi	Assistant Professor
16.	Mallikarjuna Rao Dandu	Assistant Professor
17.	B.Kamala Priya	Assistant Professor
18.	A.Dhanunjay Kumar	Assistant Professor
19.	S.Snigdha	Assistant Professor
20.	K.Venkateswara Reddy	Assistant Professor
21.	V.Venkatrami Reddy	Assistant Professor
22.	K.Karthik	Assistant Professor
23.	K.Sai Babu	Assistant Professor
24.	B.Dyva Issac Prem Kumar	Assistant Professor

FACULTY ACHIEVEMENTS

PATENT PUBLISHED

Name of the Faculty	Patent number	Title of the Patent	Agency	Status	Date of Sanction
Dr.V.Dhana Raju	2020102606	Aerial Manipulative Omni Directional Drones For Building Construction	Australian patent	Published	11.11.2020

ACTED AS RESOURCE PERSON

- Dr.K.Murahari, acted as resource person for “Multi optimisation Techniques, Minitab 18.0 software demo” in Chaitanya Bharathi Institute of Technology from 24.11.2020 to 28.11.2020.

NPTEL ONLINE CERTIFICATIONS

- The following are the details of faculty completed the NPTEL online courses during Aug- Oct 2020.

S.No.	Name of the Faculty	Title of the course	Duration	Awarding Institute	Grade
1.	Dr.P.Ravindra Kumar	Waste to Energy Conversion	8 Weeks	IIT Roorkee	Elite
2.	Dr.P.Ravindra Kumar	Heat Transfer	12 Weeks	IIT Bombay	Elite
3.	K.Venkateswara Reddy	Introduction to Mechanical Vibration	8 Weeks	IIT Roorke	Elite
4.	V.Venkatrami Reddy	Engineering Metrology	12 Weeks	IIT Kanpur	Elite

STUDENT ACHIEVEMENTS/ACTIVITIES

Students qualified in GATE/CAT/IELTS/GRE/TOEFL, etc

S.No.	Name of the student	Roll No	Qualified Exam	Qualified exam Hall Ticket No.	Score	Rank
1.	B Samba Siva Rao	15761A0305	ICET	2438010179	53.64	32299
2.	P V M Subhakar	16761A03F6	ICET	2239021165	73.94	7321
3.	Mallela Jaya Krishna	16761A03F0	ICET	2139030235	74.51	6960
4.	K.Ramanjaneyulu	16761A0326	PGECET	6439020804	54	243
5.	Y Bala Krishna	17765A0340	PGECET	6439021896	53	268
6.	Obillaneni Saimahesh	16761A0395	GRE	8506318	308	-
7.	Venkata Subba Rao V	16761A0356	PGECET	6439021886	32	3040

Students joined in Higher Studies (M.Tech / M.E, MS, MBA, etc.)

S.No.	Name of the student	Roll No	Name of Course	Institute, Place
1.	Lagiseti Virinchi Krishna	13761A0327	M.Tech	NIT Warangal
2.	Santhati Ravi Kumar	16761A03A4	MBA	Noida International University
3.	Gokavarapu Abhiram	17765A0303	M.Tech	VIT-Vellore

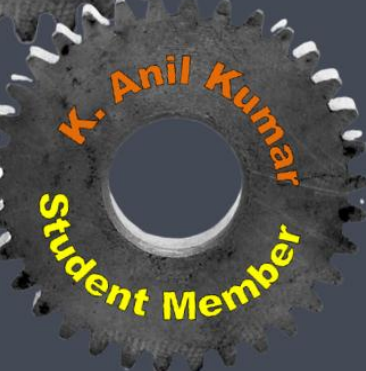
CAMPUS PLACEMENTS

S.No.	Name of the student	Roll No	Name of the Company	Annual Package
1.	N.B.M.A.Sai Pavan	17761A0336	TCS	3.6
2.	V Ramanji Reddy	17761A0353	TCS	3.6
3.	C Tharun Kumar	17761A0363	TCS	3.6
4.	K Geswanth	17761A0384	TCS	3.6
5.	M K Ramakanth	17761A0390	TCS	3.6
6.	M.Mahesh Reddy	17761A03E4	TCS	3.6

ACKNOWLEDGEMENTS

The department expresses sincere thanks to all faculty, technical staff and students for contribution towards the technical magazine- mech pulse.

Editorial Board



DEPARTMENT OF MECHANICAL ENGINEERING
LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(Autonomous)

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