

MACHINEDGE

NEWSLETTER PUBLISHED BY
MECHANICAL ENGINEERING DEPARTMENT, CMRIT

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VISION

To impart quality domain knowledge and to develop different facets of professionalism with national and global perspectives in our students, and to make them ethically strong to build our nation.

*“Not sharing KNOWLEDGE is an act of crime.
KNOWLEDGE increases by sharing NOT Saving”*

Message from Principal



MachinEdge reflects the passion of the students and faculty of Department of Mechanical Engineering by elaborating on various curricular and co-curricular activities and reflects upon their various achievements. This helps in the overall development of our students. I am delighted to present the seventh edition of MachinEdge and would like to take this opportunity to thank the Editorial Team, faculty, trustees and all the other contributors of this edition of MachinEdge.

- Dr. Sanjay Jain

Message from HOD



Greetings from the Department of Mechanical Engineering, CMR Institute of Technology, Bengaluru. Equipped with a pool of experienced, talented and multifaceted faculty team prepared to thrive in the new normal, the faculty have once again exhibited tenacity through adaptation and gaining competency in successfully handling hybrid classes (online & offline) and laboratories in the times of pandemic. They evinced empathy towards students, particularly while handling critical subjects replete with tough concepts, derivations and solutions to numerical problems. It is heartening to note that campus placements of students graduating from the mechanical department have witnessed a steep rise despite the feeble job market and the prevailing pandemic situation. I especially congratulate our student mentors who have constantly motivated their mentees to participate in state/national level competitions; excel in their studies; take part in various innovative projects and club activities, and keep abreast of technology by suggesting webinars and online symposiums from time.

-Dr. B Rajendra Prasad Reddy

INDUSTRY CONNECT



SI No	Conducted at	Type of training	Topic	Resource person and designation	Start Date	End Date	Duration
1	Department level	Guest Lecture	Industry Innovative Safety Solutions	Mr. G.K.Veerabhadrappa, Manager-Twok Bangalore	21/4/2022	21/4/2022	2 Hours
2	Department level	Guest Lecture	Computer simulation methods for industrial process	Dr. N.Ravichandran Vulva Engg. Private Limited Bangalore	6/6/2022	6/6/2022	2 Hours
3	Department level (Faculty)	Guest Lecture	Computer simulation methods for industrial process	Dr. N.Ravichandran Vulva Engg. Private Limited Bangalore	28/6/2022	28/6/2022	2 Hours

JOURNAL PUBLICATIONS



Title: Investigation on wear characteristics of Al 2219/Si₃N₄/Coal bottom ash MMC

Faculty: Dr Arunkumar T

Date: 30-04-2022

Abstract:

High-energy ball milling is used to create nanostructured materials from coal bottom ash (CBA) and silicon nitride (Si₃N₄). 36 h of ball milling coal bottom ash reduced it to 51.3 nm, while silicon nitride was reduced from 61.2 nm to 29 nm. Metal Matrix Composites (MMC) is fabricated through liquid stir method. The composites wear rate went up with nano coal bottom ash and nano silicon nitride reinforcements due to clustering, as well as a lack of interfacial connection between the base material and hybrid reinforcements employed. Increased frictional drive causes magnified debonding and easy exclusion of composite particles, accelerating the amount of wear. The friction coefficient reduces in all composite configurations as the average load increases.

Title: Experimental investigation on stir casted hybrid composite AA7068 with SiC and coconut shell fly ash



Faculty: Dr Arunkumar T

Date: 30-04- 2022

Abstract:

Hybrid aluminium matrix composites through stir casting were made and their mechanical properties are evaluated in this research paper. To strengthen AL7068 hybrid aluminium matrix composites with different SiC weight percentages were created using SiC (0, 2, 4, 6, and 8), coconut shell fly ash (4 wt%) and nano magnesium (2%). Hardness, Impact, ductility and Tensile Strength are just a few of the mechanical properties discussed in this work. Researchers found that adding eight percent SiC reinforcement to aluminium 7068 alloy reinforced with four percent coconut shell fly ash increased the composites' hardness through 32 percent. Adding six percent SiC and four percent coconut shell fly ash to an aluminium alloy 7068 increased its tensile strength by 65 percent. A combination of coconut shell fly ash with Silicon carbide reduced the ductility of the composite material. Aluminium alloy with CSFA and SiC increased the impact energy to 3.2 J. The impact strength increased and decreased in fabricated composites when reinforcement was added to base material.

Title: Evaluation of flexural and impact behaviour of mango seed shell short fiber reinforced composites



Faculty: Mr. VenkateshNaik

Date: 28-04- 2022

Abstract:

Natural Fiber composites have witnessed remarkable growth in the last decade due to their superior performance and durability. The purpose of this research is to use experimental approaches to investigate the mechanical characteristics of a novel Mango seed shell fibre reinforced epoxy composite. The study focuses specifically on measuring the impact and flexural behavior of the randomly oriented mango seed shell short fiber composite at varied fibre weight ratios, which was fabricated using hand lay-up method. The impact and flexural test results revealed that randomly oriented mango seed shell short fibre reinforced composites have competitive impact and flexural qualities when compared to typical natural fibre reinforced composite materials such as banana, jute, sisal, and coir.

Title: Analysis of Variable Compression Ratio Engine Using Biodiesel when Incorporated with Metal Oxides from Chemical and Biological Resources



Faculty: Dr Arunkumar T

Date: 30-06- 2022

Abstract:

Specifically, the current investigation will look at the impacts of nano emulsions such as titanium and zinc oxides as well as plant extracts and a four-stroke D.I.VCR engine for biodiesel that is produced both chemically and biologically on the environment. Meanwhile, when a homogeneous catalyst is used, a substantial volume of wastewater is made available for the separation and cleaning of the biodiesel catalyst. Because of this, waste cooking oil (WCO) was used to make biodiesel, which were then transesterified using heterogeneous base catalysts. This was done for environmental reasons as well as to minimize the cost of producing biodiesel. The D.I variable compression engine's performance and engine parameters, such as brake specific fuel consumption, brake thermal efficiency, and CO, HC, and NO_x emissions, were investigated. Nanoparticles have been shown to produce less NO_x than pure diesel when combined with zinc oxides that have been biologically generated at the lowest possible concentration. The carbon dioxide emissions from a biologically generated titanium oxide sample are greater than those from the other samples, with Pure Diesel emitting the least amount of CO₂. The emission of less oxygen from a Pure Diesel sample and a chemically generated titanium oxide sample showed a pattern that was comparable. A comprehensive study was conducted to examine the performance and emission characteristics of an internal combustion engine with and without the use of nano additives, and the findings revealed an astonishing outcome.



*Title: Thermal Conductivity of Thermally Insulated Concretes
in a Nuclear Safety Vessel of Reactor Vault: Experimental
Interpretation*

Faculty: Dr Arunkumar T

Date: 21-06- 2022

Abstract:

Thermally insulated concretes are a type of alternative building material that helps improve thermal efficiency in nuclear reactor vault safety vessel applications. The experimental results of thermal conductivity values of lightweight concrete materials at various temperatures are presented in this paper. To minimize heat conduction in concrete, different lightweight aggregates and vermiculite are employed as coarse aggregate alternatives. Both linear and plane heat source approaches are used to calculate the thermal conductivity values of the specimens. The findings emphasize that increasing the proportion of lightweight particles in concrete may dramatically lower the thermal conductivity, with the kind of lightweight aggregates having a vital role in thermal insulation. The inclusion of micron-sized vermiculite decreases heat conductivity even further; however, the effect is less obvious than that of lightweight particles.



Tech Talk

SL NO	TOPIC	FACULTY	DATE
1	A Study on the Effect of Sulphur and Phosphorous on the Mechanical Characteristics of C45 Steel	Mr. PuneethKumarN	21/04/2022
2	Development of high performance nanocomposite	Dr. Arunkumar T	09/06/2022
3	Understanding TCAS	Mr. Shreyas P	09/06/2022
4	Linear static analysis of simple cantilever beam by using MSC Pattern software	Mr. Prashant Hatti	23/06/2022
5	Analysis of Stresses in Welded joint using MSC Software	Mr. Manikandan H	30/06/2022

CLUB ACTIVITY



MECHA GD Electric Engine VS Internal combustion engine”

venue :- ME203

Date: 18/05/2022

EVENT DESCRIPTION:

This event is all about having a group discussion on topics

Objective :-

The activity is conducted to build communication skills as well as leadership skills.

Open for all semester students & this event is attended by 35 students. It started at 1:00pm and students started the discussion on the given topic. One minute is assigned to every participating student to express their view and after the discussion a Q&A session was held to understand the topic better. The event is successfully conducted at 2:00pm



RC CARWS

Venue :- ME203

Date:25 & 26 May 2022

OBJECTIVE : - To give the knowledge about the industry based material and the practical application of mechanical engineering.

EVENT DESCRIPTION:

This event was conducted to give an insight on what material and methods are required to build "RC cars". Event started from 1:15pm on 25 & 26 May, And it successfully end at 2:00 pm

Open for all semester students & Total 11 students participated in this event.



WORKSHOP ON DESIGN THINKING AND PROTOTYPING



Venue :- ME203

Date: 27 May 2022

OBJECTIVE:

A Design Thinking workshop will spark innovation, foster a user-centric mindset, and get cross-functional teams working together to design a great product.

EVENT DESCRIPTION:

Workshop facilitation is an important skill for any designer, but it can be tricky to master.

A Design Thinking workshop is a hands-on, activity-based session built around the Design Thinking process. Most often, these are conducted in person, but you can certainly adapt and conduct a remote Design Thinking workshop. Based on the five phases of Design Thinking, a Design Thinking workshop focuses on:

- ✓ **Empathy:** Getting to grips with a real user problem and building empathy for the target users / customers.
- ✓ **Ideation, innovation, and problem-solving:** Generating as many ideas and potential solutions as possible.
- ✓ **Prototyping and testing:** Building low-fidelity prototypes of the ideas generated, ready for testing on real or representative users.



Design thinking workshops are all about collaboration and problem-solving. As a designer, you might hold a Design Thinking workshop with your direct team in order to tackle a tough design challenge you've been struggling with. However, Design Thinking workshops aren't just for designers; they are also increasingly used to teach professionals how to innovate and problem-solve. Total 45 students participated in the event & the event started at 1:00 pm and successfully completed at 2:30 pm.



CAREER PATH PLANNING



Venue :- ME203

Date:27May 2022

OBJECTIVE:-

The objective of the event was that all the participants be able to plan their future career or professional life.

EVENT DESCRIPTION:-

The event mainly focused on making the participants aware of the various Mechanical Engineering fields which are in demand, they were also given a brief insight in each of the field and the students were also given important websites for those who want to apply for Masters Abroad and were told about the language requirements as well as the institutes which offer such assistance to match the requirements.

Total 20 students participated in the event & the event started at 1:00 pm and successfully completed at 2:30 pm.





THINK MECHANICAL

Venue :- ME001

Date:25 August 2022

OBJECTIVE:-

Think Mechanical is an open playground for engineers to question ideas, make new ones and have a discussion about anything and everything a mechanical engineer would face in a real world situation.

EVENT DESCRIPTION:-

The Think Mechanical Talk held on the 25th of August had participants from all years of B.E coming forward and showcasing their brilliant orating skills, wherein the candidate will be picking a topic , will be given 2 minutes to organize their thoughts and be allotted an additional 2 minutes to speak on the chosen topic.

Total 25 students participated in the event & the event started at 1:15 pm and successfully completed at 2:15 pm.



PATENT DRAFTING AND FILING

Venue :- MEOO1

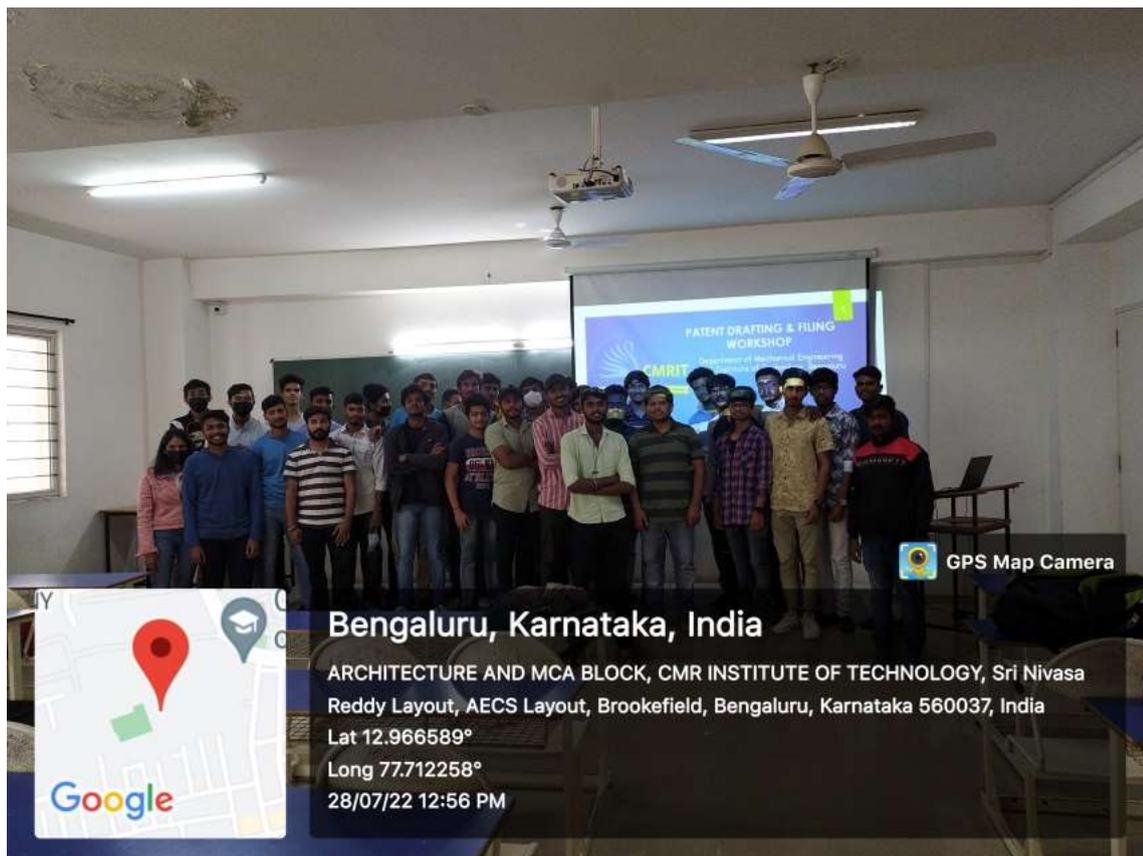
Date: 28 July 2022



**SPEAKER: PROF. VINAY M N, DEPT OF MECHANICAL
ENGINEERING**

EVENT DESCRIPTION:-

Patent drafting and filing workshop was organised by the department of mechanical engineering. Around 50 students from mechanical engineering department attended the workshop. Students were trained to write a patent draft and were briefed about patent filing process.





PLACEMENTS

SL NO	NAME	USN	COMPANY NAME
1	ARUN P R	1CR18ME007	Headrun
2	ATCHYUTUNI SRI DUTTA AKHIL	1CR18ME009	MyCaptain
3	CHEZHAN U V	1CR18ME014	Wipro
4	DEEPAK T R	1CR18ME020	Sprinklr
5	MITHUN GOWDA M S	1CR18ME043	Sacha
6	NETHRAVATHI R	1CR18ME046	Sacha
7	PRATHVI N	1CR18ME053	Bosch
8	RAHUL RAJASEKARAN D	1CR18ME057	Infosys
9	ROHAN A KAMMAR	1CR18ME060	Infosys
10	ROHIT RAJU C	1CR18ME062	Bosch & Infosys
11	VENUGOPALREDDY S G	1CR18ME083	Cognizant_GenC & Wipro
12	VIGHNESHWAR SUKRU GOUDA	1CR18ME085	Infosys
13	SHASHANK R	1CR19ME434	Emertxe



RESULTS

RESULT ANALYSIS FOR VII SEM BE (MECH), 2021-2022 (ODD SEM)

Total appeared	FCD	FC	SC	Failures	WH	Pass	Pass %
124	97	15	-	12	-	112	90

RESULT ANALYSIS FOR VIII SEM BE (MECH), 2021-2022 (EVEN SEM)

Total appeared	FCD	FC	SC	Failures	WH	Pass	Pass %
124	122	122	-	2	-	122	98

RESULT ANALYSIS FOR V SEM BE (MECH), 2021-2022 (ODD SEM)

Total appeared	FCD	FC	SC	Failures	WH	Pass	Pass %
103	22	25	-	56	-	47	46

RESULT ANALYSIS FOR III SEM BE (MECH), 2021-2022 (ODD SEM)

Total appeared	FCD	FC	SC	Failures	WH	Pass	Pass %
51	8	-	-	43	-	8	16



EDITORIAL COMMITTEE

STUDENTS

Thushar N (1CR20ME020)

"No Pain No Gain"



Ananya Singh (1CR20ME002)

"A Little Progress Each Day Adds up to Big Results"



Karthikeyan M (1CR20ME008)

"Science is Simply Common sense at its Best"



FACULTY



Dr. B Rajendra Prasad Reddy,
Professor & Head- Mech, CMRIT



Dr. Vijayananda Kaup,
Professor - Mech CMRIT



Dr. Arunkumar T
Associate Professor, Mech, CMRIT



DEPARTMENT OF MECHANICAL ENGINEERING

