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## DEPARTMENT OF MECHANICAL ENGINEERING

### MONTHLY NEWS – OCTOBER 2023

#### **About Department of Mechanical Engineering**

The department offers UG program in B.E Mechanical engineering from the year 2005. The department started a PG program M.E Industrial Safety Engineering from this academic year 2018-2019. This course has wide range of job opportunity in the Industrial and Academic sector of India as well as abroad. The Department aims at providing the students with a perfect blend of intellectual and practical experiences with the support state-of-the-art laboratories and well-defined academic structure. The UG program is accredited by National Board of Accreditation (NBA). The special feature of the Department has established three applied laboratories, in addition to the regular labs to support students to master skills to make each one industry-ready, with a solid grounding in the principles and practice of Mechanical Engineering. We also have a strong academy for training students to appear for GATE exam.

#### **Vision of the Department**

To produce competent Mechanical Engineers of excellent technical and managerial skills with profound morality for global, national and confront societal development.

#### **Mission of the Department**

1. To provide quality education in Mechanical Engineering with an interdisciplinary approach, encouraging innovation, research, and Entrepreneurship through world-class infrastructure and proficient teachers.
2. To make the department self-reliant through multiple programs with excellent curricula, best practices, and industry exposure.
3. To inculcate technical, professional, and leadership skills, moral ethics, and lifelong learning.

## Programme Educational Outcomes

The Bachelor of Mechanical Engineering curriculum is designed to impart Knowledge, Skill, and Attitude to the graduates to

PEO 1: Have a successful professional career in Mechanical Engineering and allied industries, either by employment or through entrepreneurship.

PEO 2: Establish competency in Design, Thermal, Materials, and Manufacturing system with ethics and social responsibility.

PEO 3: Have a continual receptiveness for leadership and social challenges.

## Message from the Head of the Department

**Dear Colleagues,  
Greetings!**

I have great pleasure and pride to announce that the Department of Mechanical Engineering is publishing the newsletter for the month of October 2023. Amidst the Covid Pandemic situation, we strived hard to keep the students engaged, and utilize the time not only for quality education and for self-development. We are steadfast in our progress as it involved various activities that enabled the hidden talents of the department students and faculty members to be brought into light. Besides the lockdown, our faculty members are continuously attending various training programs, publishing research papers, book chapters and are also working on getting patents.

This newsletter is the reflection of department activities which showcases all the events held in the department, contribution of faculty members, students and the best practices adopted. I would like to congratulate all the members of the editorial board for their sincere effort to realize this venture.



**Dr. R. Samuel Hansen, M.E., Ph.D.**  
Professor & Head  
[samuel\\_hansen@rediffmail.com](mailto:samuel_hansen@rediffmail.com)

## EDITORIAL BOARD

Dr. Dr. R. Samuel Hansen, Professor & Head of Department, Editor – in – Chief.

Dr. S. Balakrishnan, Assistant Professor, Mechanical Department, Faculty In charge.

# GUEST LECTURE

The Department of Mechanical Engineering and Electrical and Electronics Engineering combined together and organized a guest lecture on "Safety Best practices in Industry". The event was conducted on October 27th, 2023. This event was organized by Mr. J. Jeremy Jeba Samuel, Assistant Professor of the Department of Mechanical Engineering, for the Final Year Electrical and Electronics Engineering and Mechanical Engineering Students for the course "19ME7718: Industrial Safety Engineering". Er.Immanuel Christopher, Manager – Safety, The Ramco cements limited, Ramasamy Raja Nagar, Virudhunagar was the Resource Person of this Program. The event was held through online mode during the time schedule of 11:00 AM to 12:15 PM. The resource person gave very highly informative and valuable insights into critical topics such as firefighting, LOTO systems, safety management systems, smoke detectors, etc. in various industries. The Session was more practical and the Resource Person is more interactive with the Participants. He gave many pictorial representations for our easy understandings and the participants volunteered themselves in asking questions about the topic. The lecture left a lasting impact on the audience and reinforced the idea that safety should always be a top priority in any organization. It was a valuable learning experience that will undoubtedly have a positive influence on the safety practices in the industries represented in the audience.



The poster features the following information:

- FRANCIS XAVIER ENGINEERING COLLEGE** - AN AUTONOMOUS INSTITUTION, Virudhunagar, Tirunelveli - 627 003.
- INDIA RANKINGS 2023** - 51-100 BAND.
- Guest Lecture on "Safety Best Practices in Industry"**
- GUEST LECTURER**: **Er. Immanuel Christopher**, Manager - Safety, The Ramco Cements Limited, Ramasamy Raja Nagar, Virudhunagar.
- Organized by**: Department of Mechanical Engineering.
- Co-ordinator**: **Mr. J. Jeremy Jeba Samuel**, Assistant Professor, Dept. of MECH - FXEC.
- Dr. K. Jeyakumar**, General Manager - Development.
- Dr. V. Velmurugan**, Principal.
- 27 FRIDAY OCTOBER 2023**, 11:00 am to 12:00 pm.



## INDUSTRIAL VISIT

A batch of 53 final year students and 2 faculty members from the department of mechanical engineering visited Kerala Automobiles Limited, Trivandrum on Oct 27, 2023. During the visit, we had the privilege of experiencing the following highlights:

a. Introduction to the Company: We were welcomed by the KAL management team and given an overview of the company's history, vision, and mission.

b. Manufacturing Process: We were taken on a guided tour of the production facility, where we witnessed the entire manufacturing process, including welding, painting, assembly, and testing.

c. Quality Control: The quality control department explained their stringent quality checks and how they ensure that every vehicle meets industry standards.

d. Safety Measures: We learned about the safety protocols in place, emphasizing the company's commitment to employee well-being.

e. Environmental Initiatives: KAL's commitment to environmental sustainability was evident in their waste management and eco-friendly manufacturing processes.

f. Interaction with Professionals: We had the opportunity to interact with engineers, technicians, and other professionals who shared their experiences and insights into their roles.

Overall the visit to Kerala Automobiles Limited proved to be a valuable educational experience. We gained a better understanding of the automobile manufacturing industry, the challenges it faces, and the innovative solutions used to overcome them. The visit also allowed us to see theoretical concepts come to life in a real-world setting. Dr.R.K.A.Bhalaji AP/Mech and Dr.S.Balakrishnan AP/Mech coordinated the industrial visit for students in an efficient manner.



## EXPERT TALK

A “Identifying the Inner Thirst towards Entrepreneurship” was organized by Entrepreneurship Development Cell & Institution’s Innovation Council in association with the Department of Mechanical Engineering on 17th October, 2023 at 01:30 pm to 04.30 pm. The program was held via offline mode. Dr.R.K.A.Bhalaji, AP/MECH inaugurated the session with welcome address.

Resource person began by emphasizing the importance of understanding one’s inner drive towards entrepreneurship and how it shapes one’s journey in the business world. Resource person highlighted that entrepreneurship is not merely a career choice but often a reflection of an individual’s intrinsic motivations. The expert talk explored the various intrinsic drivers such as a desire for autonomy, passion for problem-solving, the need for creativity and the aspiration for financial independence. The resource person also addressed the challenges in recognizing one’s inner thirst for entrepreneurship. Many individuals are influenced by societal norms, fear of failure or financial security concerns, which can cloud their true calling. The expert talk stressed the importance of self-awareness and introspection. She provided practical advice on how to nurture the inner thirst for entrepreneurship, strategies including mentorship, networking,

continuous learning and developing a growth mindset. These insights were particularly valuable for individuals looking to embark on an entrepreneurial journey. Finally, the expert talk concluded with an interactive Q & A session, where students had the opportunity to seek clarification and advice on their specific entrepreneurial aspirations. Totally 40 students benefited from this program.

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Vamarpettai, Tirunelveli - 627 003

**Identifying the Inner Thirst Towards Entrepreneurship**

Resource Person  
**Ms. M. Dharshini,**  
Final Year & Shused Innovator  
Dept. of Computer Science and Engineering,  
Francis Xavier Engineering College.

**OCTOBER 17<sup>th</sup> 2023**  
1:00 PM to 4:30 PM

Organized by: Entrepreneurship Development Cell & Institute's Innovator Council  
In association with: Department of Mechanical Engineering  
Co-ordinator: Dr. R.K.A. Bhalaji, Assistant Professor, AIECO  
Convener: Dr. R. Samsel Hansen, HOD / MEO  
Dr. Lourdes Poobala Rayen, Director EDC and IIC President  
Dr. K. Joyakumar, General Manager - Development  
Dr. V. Velmurugan, Principal



## PAPER PUBLISHED

Dr. S. Balakrishnan, Dr. M. Kannan, Dr. S. M. Rajkumar and Dr. K. Vinukumar has published a paper on 18.10.2023. Entitled "Characterization of mechanical and wear properties of *Prosopis juliflora* thorn powder filled epoxy nanocomposites" at Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering (SCI).

[click for updates](#)

Original article

### Characterization of mechanical and wear properties of *Prosopis juliflora* thorn powder-filled epoxy nanocomposites

S Balakrishnan , M Kannan, SM Raj Kumar and K Vinukumar

#### Abstract

The mechanical and wear behavior of agro waste thorn (*Prosopis juliflora* [PJ]) derived as a nanoparticle with different weight compositions (0, 2.5, 5, 7.5 and 10 wt.%) reinforced in an epoxy matrix is investigated in this study. First, the effect of thorn nano epoxy composite is studied under ASTM standards. The results indicated that the nanocomposites with 2.5 wt.% filler have the maximum tensile strength, flexural strength and hardness of the epoxy composite, while those with 10 wt.% filler exhibit a noticeable increase in impact strength and compressive strength. Furthermore, the incorporation of thorn nanoparticles improved the wear resistance. 2.5 wt.% nano PJ thorn composites improved wear resistance by 9.03%. Additionally, the size of the nanoparticles, the fracture surfaces, the crystalline nature, the elements and the compounds in the thorn nanofillers are examined using transmission electron microscope, field emission scanning electron microscope, X-ray diffraction, energy dispersive X-ray and Fourier transform infrared spectroscopy.

#### Keywords

*Prosopis juliflora*, thorn, nanofillers, epoxy, mechanical properties, wear resistance

Date received: 16 January 2023; accepted: 21 May 2023

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**Sage**

Department of Mechanical Engineering, Francis Xavier Engineering College, Tirunelveli, Tamil Nadu, India

Corresponding author:  
S Balakrishnan, Department of Mechanical Engineering Francis Xavier Engineering College, Tirunelveli 627003, Tamil Nadu, India.  
Email: [krishbbhek@gmail.com](mailto:krishbbhek@gmail.com)

R.K.A.Bhalaji, S.Bathrinath and K.Koppiahraj has published a paper on 13.10.2023. Entitled “A Best Worst Method to evaluate the risks in the Fireworks industry: Implications for risk mitigation” at Computational Engineering and Machine Learning Algorithms, AIP Conf. Proc. 2904, 030007-1–030007-11; <https://doi.org/10.1063/5.0170605>. It was indexed by Scopus.

## A Best Worst Method to evaluate the risks in the Fireworks industry: Implications for risk mitigation

R.K.A.Bhalaji<sup>1, a)</sup>, S.Bathrinath<sup>2, b)</sup> and K.Koppiahraj<sup>3, c)</sup>

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<sup>2</sup>Department of Mechanical Engineering, Kalasalingam Academy of Research and Education,  
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13 October 2023 16:27:04

**Abstract.** In addition to its significant contribution to economic development, fireworks industries are criticized for their negative impacts. Firework industries are often susceptible to industrial accidents and thus receive criticism from society. As numerous instant reactive chemical powders (magnesium powder, aluminium, potassium nitrate & sulphur) are being handled, the probability of occurrence of industrial accidents is quite high in the fireworks industry. Further, often there raise arguments regarding the safety standards followed in the fireworks industry. In this regard, this research focuses on recognizing and analyzing the potential risks of industrial accidents in the fireworks industry by considering a firework industry in southern India as a case reference. Initially, for identifying the risk factors, an extensive literature review followed by expert interactions was made. Then, by following the nominal group technique (NGT), the risk factors are finalized. Next, the Best Worst Method (BWM), the multi-criteria decision-making (MCDM) technique is used to analyze the risk factors using the experts' inputs. Hygroscopic reaction and friction have been identified as the most critical risk factors for industrial accidents in the fireworks industry. Based on the outcomes, this study offers some research implications that will be helpful to industrial managers for leveraging safety aspects and production rates.

### INTRODUCTION

With the continuous growth in technology and science, many process industries and innovations have emerged to manage different processes and chemicals. The safety of the employee should be a major one for all organizations. In an industry, employees are a valuable asset; precautionary measures are vital to the health and safety of the

Computational Engineering and Machine Learning Algorithms  
AIP Conf. Proc. 2904, 030007-1–030007-11; <https://doi.org/10.1063/5.0170605>  
Published by AIP Publishing, 978-0-7354-4694-6/530.00

## PATENT PUBLISHED

R. Akash Selvin Raj, J. I. Nithish Kumar, M. Balakumaran, M. Mohamed Aboobacker Students from the fourth and third years of

mechanical studies published a patent on October 6, 2023, under the supervision of Professor S. Sheik Sulaiman, who is in charge of the Innovative product development Applied lab. The title of the invention is CONTACTLESS AIR CONVEYOR, and the application number is 202341059036 A.

**PATENT Publication**  
 Innovation and Product Development Applied Lab

Application No. 202341059036 A  
 Title of the Invention: **CONTACTLESS AIR CONVEYOR**

**Inventors:**  
 M. Mohamed Aboobacker (I Year), R. Akash Selvin Raj (IV Year), J. I. Nithish Kumar (II Year), M. Balakumaran (II Year)

**Department of Mechanical Engineering**  
 Mentored by: S. Sheik Sulaiman, Assistant Prof., Dept. of Mech

(12) PATENT APPLICATION PUBLICATION	(21) Application No 202341059036 A
(19) INDIA	
(22) Date of filing of Application :03/09/2023	(43) Publication Date : 09/10/2023
(54) Title of the invention : CONTACTLESS AIR CONVEYOR	
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(86) International Application No : NA Filing Date : NA	
(87) International Publication No : NA	
(61) Patent of Addition to Application Number : NA Filing Date : NA	
(62) Divisinal to Application Number : NA Filing Date : NA	

## SEMINAR

The Seminar was organized by Safety Club in association with Department of Mechanical Engineering with the entitled ‘Ergonomics in Tyre Manufacturing Industry’ held on Oct 28, 2023 at 1.30 PM. The resource person for the event is Er.E.C.Karthik, Safety Officer, Yokohama Tyres, Tirunelveli. First of all resource person said that ergonomics, the science of designing work environments to fit the capabilities and limitations of workers, plays a crucial role in ensuring the well-being of employees, enhancing productivity, and reducing workplace injuries. Next he discussed about the ergonomics in tyre manufacturing such as workstation design, manual material handling, task rotation breaks and personal protective equipment. Next he shared the details about benefits of ergonomics and the related case studies. Finally, the resource person concluded that ergonomics plays a vital role in enhancing the work environment in the tyre manufacturing industry, benefiting both workers and companies.



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**nirf** RANKING 2023  
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**FXEC**

**SAFETY CLUB**

**Ergonomics in Tyre Manufacturing Industry**

Organised by  
**Safety Club**

**28 October 2023**  
1:30 pm - 4:30 pm

In association with  
Department of  
**Mechanical Engineering**

**Er. E.C. Karthik**  
Safety Officer  
Yokohama Tyres, Tirunelveli.

**Resource Person**

Co-ordinator  
**Dr. R.K.A. Bhalaji**  
Assistant Professor / MECH

Overall Co-ordinator  
**Mr. A. Santiago Stephen**  
Associate Professor / MATHS

Convener  
**Dr. R. Samuel Hansen**  
HOD / MECH

**Dr. K. Jeyakumar**  
General Manager - Development

**Dr. V. Velmurugan**  
Principal - FXEC

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## PLACEMENT

Sarava Kumar M, Madasamy N, Marimuthu B, Jameel Mohamed Ashiq, Abubacker Ashik N, Mahesh S, Akashan T, Dhana Seaker M, Abuzaid M final year Mechanical students are placed in AH&R Steel Detailing Private Limited, Tirunelveli on October 31, 2023.

S. No	Name	Sex	Year of passed	E-Mail ID	Mobile No
1	Saravana Kumar M	Male	2024	<a href="mailto:saravanamurugan458@gmail.com">saravanamurugan458@gmail.com</a>	6379439246
2	Madasamy N	Male	2024	<a href="mailto:madasamya7708@gmail.com">madasamya7708@gmail.com</a>	6379432903
3	Marimuthu B	Male	2024	<a href="mailto:marimuthub.ug20.me@francisxavier.ac.in">marimuthub.ug20.me@francisxavier.ac.in</a>	9751274903
4	Jameel Mohamed Ashiq	Male	2024	<a href="mailto:jameelashiq1111@gmail.com">jameelashiq1111@gmail.com</a>	9943971739
5	Abubacker Ashik N	Male	2024	<a href="mailto:ashik4connect@gmail.com">ashik4connect@gmail.com</a>	8072209871
6	Mahesh S	Male	2024	<a href="mailto:maheshdce2002@gmail.com">maheshdce2002@gmail.com</a>	7540032500
7	Akshana T	Male	2024	<a href="mailto:akshana3k@gmail.com">akshana3k@gmail.com</a>	7871487126
8	Dhana Sekar M	Male	2024	<a href="mailto:dhanasekarm.ug20.me@francisxavier.ac.in">dhanasekarm.ug20.me@francisxavier.ac.in</a>	9047843431
9	Abuzaid M	Male	2024	<a href="mailto:abuzxxd@gmail.com">abuzxxd@gmail.com</a>	9790265422

The final year students of Alagar Manikandn M and Mathumitha A were placed in the Rinex-Education Research Center, Mangaluru on October 27, 2023. The final-year student of Peer Mohamed Asif and Mathumitha A was placed in Lurn-In Academy on 14.11.2023.

RINEX to subashree26722, s...

Dear Team,

**Congratulations !!**  
 PFA the list of students who have been selected for the post of Inside Sales Strategist at Rinex. Kindly confirm their joining date at the earliest so that we can issue their internship confirmation letter accordingly.

PI RESULTS			
SL.NO	NAME	EMAIL ID	DEPARTMENT
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8	SHAHINA JALEELA S	shahinajaleela@gmail.com	ECE
9	PAVITHRAN M	pavithranm.ug20.ee@francisxavier.ac.in	EEE
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12	RAMALAKSHMI J	ramalakshmi.ug20.cs@francisxavier.ac.in	IT
13	Somnath.P.S	0211somnath@gmail.com	
14	MATHUMITHA A	mathumithas.ug20.me@francisxavier.ac.in	Mechanical
15	BALAJI SOUNDAR E	balajisoundar122@gmail.com	IT

Placement Team  
 Rinex Technologies Pvt Ltd