

# IIMT

COLLEGE OF ENGINEERING  
Greater Noida  
— Aim For Excellence —



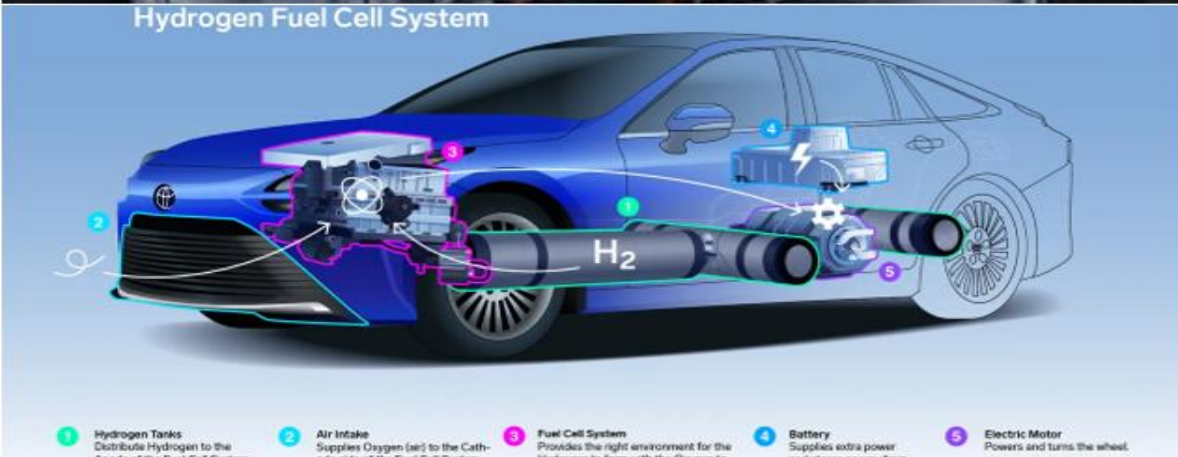
## **MECHATROMA**

A Quarterly Publication of

**Department of Mechanical Engineering**



Hydrogen Fuel Cell System



## From Chief Editor's Desk

Welcome to the latest edition of our quarterly magazine, highlighting the exciting developments and advancements within the Department of Mechanical Engineering.

Over the past few months, our faculty and students have been working vigorously, researching and exploring new technologies, methods, and approaches to mechanical engineering. Our department continues to push the boundaries of what is possible and make significant contributions to various industries.

In this edition, we showcase some of the most recent and groundbreaking research conducted by our faculty and students, including studies on renewable energy, advance manufacturing, robotics, and automation.

We also feature some of the success stories and achievements of our alumni who are making a difference in the field of mechanical engineering.



As always, we strive to provide our readers with valuable insights into the latest trends and innovations in mechanical engineering. We hope that this magazine inspires you to continue learning and exploring the field and encourages you to collaborate with us on future projects.

Thank you for your continued support, and we look forward to sharing more exciting updates with you in the next edition of our magazine.

Sincerely,

Mr. Krishna Kumar Karothiya

Chief Editor & HOD

Dept. of Mechanical Engineering

### Quote for Quarter

"If you can learn something new every day, you can teach something new every day."

*Martha Stewart*

## 2<sup>nd</sup> National Conference On New Horizons in Science, Engineering, Management & Humanities

On 7<sup>th</sup> Feb. 2023, 2<sup>nd</sup> National Conference on “New Horizons in Science, Engineering, Management & Humanities” was organized by the Departments of Mechanical Engineering, Civil Engineering, and MBA. A large number of delegates and faculties participated in the conference and 30 research papers were published in the reputed scientific journal “International Journal of Scientific Research in Science and Technology”. Students and faculties from various colleges presented their paper in this conference. The certificates were issued to the participants as well as for the published papers. Best paper award was also given with the certificate and trophy.

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# 2<sup>nd</sup> NATIONAL CONFERENCE

NEW HORIZONS IN SCIENCE, ENGINEERING,  
MANAGEMENT AND HUMANITIES 2023

## NHSEMH-2023

Date:  
7<sup>th</sup> FEBRUARY, 2023



Organizer:  
Department of Mechanical, Civil, MBA  
IIMT College Of Engineering, Greater Noida (U.P.)

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**Mr. Vishal Vasistha**  
Mob. : +91 9056577596  
Email ID: nhsemh2023@gmail.com

Conference Date:  
07<sup>th</sup> February, 2023

Submission Last Date:  
30<sup>th</sup> January, 2023

Notification of Status of Paper:  
Within 03 days after receiving the Research Paper

Fee Submission:  
With in 03 working days from the date of acceptance

SCAN FOR REGISTRATION



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## Industrial Visit

### Sofcon India Pvt. Ltd. Noida

Department of Mechanical engineering organized an Industrial visit of B.Tech. Mechanical Engineering students to Sofcon India, Noida. In this visit, 49 students and 2 faculty members from the department participated.

The Sofcon India, conducted brief introduction of various training programs conducted by them to help students to improve their technical skill. They also have some prototype training modules of hydraulic and pneumatic systems which are very interesting.



Students at Sofcon India, Noida

## A Session on “Achieving Problem-Solution-Fit and Product-Market-Fit”

On 24Feb 2023, the Department of Mechanical Engineering organized a session on “Achieving Problem-Solution-Fit And Product-Market-Fit”. Dr. Avinash Ravi Raja presented the topic very well and made it easier to understand various terminologies related to the product-market-fit.

The speaker started his talk with a brilliant example to explain the concept of problem-solution-fit. Interesting examples were discussed to set up an approach to find the solution to a problem. Dr. Raja gave motivational talk to the students to always keep pushing themselves to find various problems around them and help society by delivering solutions to those problems.



**INSTITUTION'S INNOVATION COUNCIL**  
(Ministry of Education Initiative)

**IIMT**  
COLLEGE OF ENGINEERING  
Greater Noida  
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Institution's Innovation Council (IIC - IIMT) & Department of ME  
jointly organising

Session on

### Achieving Problem Solution Fit & Product Market Fit

**Speaker**  
**Dr. Avinash Ravi Raja**  
Assistant Professor,  
Medi-caps University, Indor

Date: Friday February 24, 2023 | Time 12:00 pm Onwards  
Venue: Sarabhai Hall

**FACULTY COORDINATOR**  
**Dr. Sumit Mahajan**  
Assistant Professor  
IIMT College of Engineering  
sumit3970\_gn@iimtindia.net

**STUDENT COORDINATOR**  
**Aman Kumar Jha**

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**Dr. Avinash delivering the talk**

## Guest Lecture on “Frugal Innovation and Social Entrepreneurship”

On 23<sup>rd</sup> Feb.2023, a guest lecture on “Frugal Innovation and Social Entrepreneurship” was organized by the Department of Mechanical Engineering. The objective of this session was to help students and faculties to understand the concept of frugal innovations and social entrepreneurship to improve global sustainability due to a continuous reduction in the demand for resources in different emerging market.

Mr. Sunil Kumar Ojha presented excellent examples to our students that how emerging markets demand for innovation and need for new way of innovation by doing more with limited resources.



**INSTITUTION'S INNOVATION COUNCIL**  
(Ministry of Education Initiative)

**IIMT**  
COLLEGE OF ENGINEERING  
Greater Noida  
— Aim For Excellence —

Department of Mechanical Engineering is organising

Session on  
**Frugal Innovation and Social Entrepreneurship**

**Sunil Kumar Ojha**  
IIC Innovation Ambassador  
IIMT College of Engineering  
Greater Noida

DATE: 23.02.2023  
TIME: 12:00 PM - 12:50 PM  
MODE: ONLINE

FACULTY COORDINATOR  
**Dr. Sumit Mahajan**  
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STUDENT COORDINATOR  
**Aman Kumar Jha**

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**Mr. Sunil addressing the technical Session**



## A Session

on

### “Relevance of Design Software in Manufacturing Industries”

On 21Mar 2023, the Department of Mechanical Engineering organized a session on “Relevance of Design Software in Manufacturing Industries”. The guest Speaker was Er. Rohit Pahwa, Senior Consultant, DUCAT India Pvt. Ltd. Noida.

Mr. Pahwa explained the importance of design software in the manufacturing industry giving many examples from the sector. He also elucidated the application of design software in mass production involving complex shapes, creating 3D modelling and reduction in production cost.



**IIMT**  
COLLEGE OF ENGINEERING  
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DEPARTMENT OF MECHANICAL ENGINEERING ORGANISING

Guest Lecture on

**RELEVANCE OF DESIGN SOFTWARES IN MANUFACTURING INDUSTRIES**

**Speaker**  
**Er. Rohit Pahwa**  
Senior Consultant  
DUCAT India Pvt. Ltd. Noida

Date: Tuesday, March 21, 2023 | TIME: 11:10 AM ONWARDS  
VENUE- SARABHAI HALL

FACULTY COORDINATOR: **DHANANJAY K. RAMAN**  
ASSISTANT PROFESSOR  
IIMT COLLEGE OF ENGINEERING

STUDENT COORDINATOR: **Mohit Sharma**  
B. Tech 3rd Year  
Mechanical Engineering

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**Er. Rohit Pahwa delivering lecture**

## SPORTS CORNER

### Basketball Championship: “Spardha”

It’s a great pleasure to announce that one of our students **Aman Upadhyay** 4<sup>th</sup> year Mechanical Engineering led his team to win third prize in a Basketball sport championship.

This activity acronym “**SPARDHA**” was organized by “**New Delhi Institute of Management**” on 16-17<sup>th</sup> Feb. 2023.

The students were congratulated and honored by the Hon’ble MD IIMT Group of Institutions.







**Respected MD Sir Honoring the Winning Team**

## FACULTY CORNER

### Book Chapter Published

On

### “Performance and Emissions Characteristics of CI Engine Fuelled with Waste Engine Oil Biodiesel”

In the month of Jan 2023, **Mr. Rahul Sharma**, Asst Prof, Department of Mechanical Engineering, IIMT College of Engineering Greater Noida, contributed a book chapter titled “**Performance and Emissions Characteristics of CI Engine Fuelled with Waste Engine Oil Biodiesel**” published in “**Emerging Trends in Mechanical and Industrial Engineering, Lecture Notes in Mechanical Engineering**” book series (LNME) by **Springer**.



**Emerging Trends in Mechanical and Industrial Engineering** pp 457–465 | [Cite as](#)

[Home](#) > [Emerging Trends in Mechanical and Industrial Engineering](#) > Chapter

## Performance and Emissions Characteristics of CI Engine Fuelled with Waste Engine Oil Biodiesel

[Roshan Raman](#) , [Rahul Sharma](#) & [Yunis Khan](#)

Chapter | [First Online: 01 January 2023](#)

**183** Accesses

Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

### Abstract

In this study, waste engine oil is utilized as an alternative fuel for the CI engine. The physico-chemical characteristics of waste engine oil blended with diesel are found to be closer to standard diesel. It is observed that engine performance was satisfactory; however, BSFC was lower than neat diesel. Furthermore, considering cost impact, it can be economical while production at a mass scale with controlled parameters. In India, there are a lot of automobile users; hence, there is a huge availability of waste engine oil. Hence, they can be easily

## SCI INDEXED PAPER PUBLICATION

on

**“Investigations on Wetting and Structural Behaviour Using CaF<sub>2</sub>-SiO<sub>2</sub>-CaO-22.5%TiO<sub>2</sub> SMAW Electrode Coating for AUSC Applications”**

On 2<sup>nd</sup> March 2023, Dr. **Sumit Mahajan**, Asst. Prof, Department of Mechanical Engineering, IIMT College of Engineering Greater Noida, published a paper titled **“Investigations on wetting and structural behavior using CaF<sub>2</sub>-SiO<sub>2</sub>-CaO-22.5%TiO<sub>2</sub> SMAW electrode coating for AUSC applications”** in the Journal **“Proc. Inst. Mech. Eng. Pt. L J. Mater. Des. Appl.”** an SCI Indexed Journal.

DOI: <https://doi.org/10.1177/14644207231159833>

Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications



Impact Factor: **2.663** / 5-Year Impact Factor: **2.459**

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Restricted access | Research article | First published online March 2, 2023

Investigations on wetting and structural behavior using CaF<sub>2</sub>-SiO<sub>2</sub>-CaO-22.5%TiO<sub>2</sub> SMAW electrode coating for AUSC applications

[Vijay Kumar](#) , [Rahul Chhibber](#), and [Sumit Mahajan](#) [View all authors and affiliations](#)

[OnlineFirst](#) | <https://doi.org/10.1177/14644207231159833>

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### Abstract

This study investigates the structural behavior and high-temperature wettability of a CaF<sub>2</sub>-SiO<sub>2</sub>-CaO-22.5%TiO<sub>2</sub> shielded metal arc welding electrode coating for advanced ultra-supercritical power plant applications. The wettability parameters were measured, including contact angle, spread area, adhesion energy, and surface tension. Extreme vertices mixture design approaches were used to develop 13 different electrode coatings. To determine the contact angle at solid/liquid interface, circular pellets were made from powder samples and heated inside the furnace at 1125°C at a constant heating rate. Young's and Boni's equations are used to calculate the surface tension value for 13 coated samples using the calculated contact angle. Adhesion energy for 13 coated samples is calculated using Dupre's equation. Phases and structural behavior of coating samples were measured by Fourier transform infrared spectroscopy and X-ray diffraction. The developed regression model estimates the impact of primary ingredients and their interaction on the calculated wettability characteristics. CaF<sub>2</sub>.SiO<sub>2</sub>, CaO.SiO<sub>2</sub>, and CaO.CaF<sub>2</sub> binary mixture is the more favorable and substantially impacts contact angle, whereas ternary interactions of CaO.SiO<sub>2</sub>.CaF<sub>2</sub> shows an opposite effect on contact angle. Coating numbers 2 and 10 give better wetting behavior and spread area due to the low value of contact angles. Individual ingredient shows an increasing effect on surface tension and adhesion energy. Ternary component of CaO.CaF<sub>2</sub>.SiO<sub>2</sub> is favorable and shows an



## **Chief Editor**

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**Mr. Vishal Vasistha**

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**Mohit Sharma (4<sup>th</sup> Yr.)**

**Nikhil (3<sup>rd</sup> Yr.)**