Department Activity Report – March 2025

Department of Mechanical Engineering

1. Department programs

➢ Session on Introduction to MEP Industry

Date & theme	March 21st 2025 – Alumni talk
Title of Talk	**Introduction to construction and maintenance engineering based on ASME SEC VIII DIV 2, ASME SEC V, API 510, 573, 653- Introduction to MEP industry**
Description	A one-hour introductory session, led by Mechanical Integrity Engineer Sherin Hussain(Alumni, 2017-21 batch) , provided a concise overview of key industry standards. The session covered foundational aspects of construction and maintenance, emphasizing ASME SEC VIII DIV 2 (Pressure Vessels), ASME SEC V (Nondestructive Examination), API 510 (Pressure Vessel Inspection Code), API 573 (Inspection of Fired Boilers and Heaters), and API 653 (Tank Inspection, Repair, Alteration, and Reconstruction). An introduction to the MEP (Mechanical, Electrical, and Plumbing) industry was also presented. Practical insights were drawn from Sherin Hussain's extensive experience in mega turnaround projects for major entities like Saudi Aramco, SABIC, YASREF, and Qatar Shell, highlighting the real-world application of these standards. He is certified on API 510, CSWIP 3.1, ASNT NDT Level 2 certifications.
Venue	Mechanical Seminar Hall

➢ International Day of Forests

Date	March 24th 2025 - Forest and Food
Title of Talk	**Food will thrive only, Till the wood survive**
Description	Dr. Kaiser Younis, Professor, Dept of Food Technology will address International Forestry Day on March 24th, 2025, focusing on the theme "Food will thrive only, Till the wood survives." The session will emphasize the vital link between forests and food security. Dr. Younis will discuss in detail how forests regulate climate and water cycles, crucial for agriculture. The highlights of the session will be forests' role in providing diverse food sources, especially for indigenous populations.

Venue	Mechanical Department Seminar Hall TKMIT

2. Student registered for NPTEL Exaination

Sl. no.	Semester	No of Students regd	Total students
1	2^{nd}	16	16
2	4^{th}	1	21
3	6^{th}	8	11
4	8^{th}	1	13

3. Student achievement

- Nikhil N, S8 ME student and his team secured second prize in Robosoccer at Adishankara Institute of Engineering & Technology held on March 1st 2025.

- Nikhil N, S8 ME student got first prize in Roborace held at Saintgits college of Engineering on February 28th 2025.

Saintgits College of Engineering (Autonomous)

NAKSHATRA 25

MASQUERADE OF ELITES

A SESA EVENT

Certificate of Appreciation

THIS CERTIFICATE IS PRESENTED TO

N. NIKHIL

of F.K.M ST

for achieving I in ROBO RACE.

of NAKSHATRA 2025 held at Saintgits College of Engineering (Autonomous), Kottayam on 28th February and March 01st 2025

Dr. AJU ZACHARIAH MANI
FACULTY COORDINATOR

Fr. MARIE KOTTAYIL JAMES
FACULTY CHIEF COORDINATOR

Dr. SUDHA T
PRINCIPAL

LEARN . GROW . EXCEL

- Nikhil N, S8 ME student secured second prize in the 8 kg Robo Race held at Mar baselious college of Engineering Trivandrum on February 27th 2025.

- Nikhil N, S8 ME student secured second prize in Robowar held at Bishop Jerome Institute of Technology, Kollam on March 6th 2025.

- Nikhil N, S8 ME student secured second prize in Robowar held at Sreebudha College of Engineering, Patoor on March 15th 2025.
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4. Paper Publication

- Dr. Mubarak M. published a paper on the journal "**International Journal of Hydrogen Energy", Q1 Journal** with an **Impact factor- 7.57 (23-24)**of Elsevier publication on the topic "*Enhancing performance and reduce ng emissions with renewable fuels: Prosopis Juliflora methyl ester–alcohol blends with hydrogen in a compression ignition engine*".

Contents lists available at ScienceDirect

International Journal of Hydrogen Energy

journal homepage: www.elsevier.com/locate/he

Enhancing performance and reducing emissions with renewable fuels: Prosopis Juliflora methyl ester–alcohol blends with hydrogen in a compression ignition engine

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ARTICLE INFO

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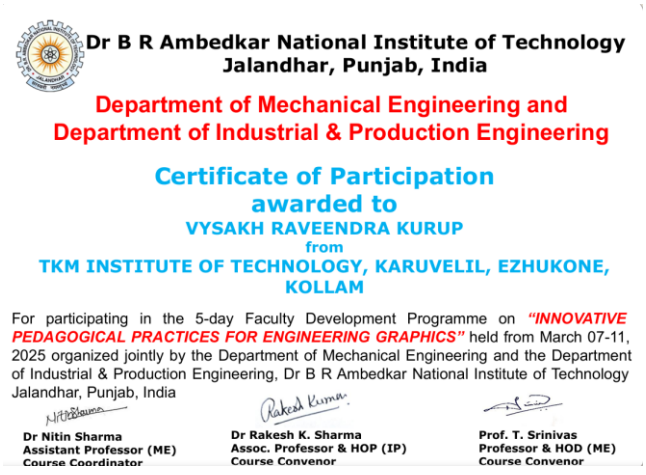
Alcohol blends
Performance
Vibration

ABSTRACT

The rapid depletion of conventional fuels and volatile diesel prices globally necessitate urgent research into sustainable, eco-friendly energy alternatives. In this study, Prosopis Juliflora methyl ester (JFME) is explored as a substitute fuel, combined with amyl alcohol and decanol blends, both with and without hydrogen induction. The comprehensive experimental approach assesses the performance, combustion, emissions, and vibration parameters of a water-cooled, single-cylinder compression ignition (CI) engine running at 1500 rpm and delivering 5.2 kW of power. Initially, JFME exhibits higher emissions and lower performance due to its higher viscosity. To enhance JFME attributes, amyl alcohol and decanol are added at a 20% volumetric ratio, denoted as A20 and D20. The experimental results revealed that the A20 blend exhibited the maximum heat release rate (HRR) and peak pressure, with comparable brake thermal efficiency (BTE) as diesel, while significantly decreasing smoke and NO emissions by 29% and 7%, respectively. Furthermore, enriching A20 and D20 with hydrogen induction improves BTE and decreases smoke, CO, and HC emissions due to hydrogen's high flame speed and higher heating value, which enhance the combustion process and raise combustion temperature, albeit leading to higher NO emissions. Engine vibration was also measured throughout dual-fuel operation, which shows that higher rates of hydrogen admission cause an increase in engine vibration. In conclusion, the utilization of the A20 blend with 10 lpm hydrogen (A20+H10) presents a promising dual-fuel option for diesel engines, offering improved efficiency and reduced emissions.

5. FDP/ Conference attended by faculties

- Mr. Vysakh Raveendra Kurup attended a faculty development programme Organized By *Department of Mechanical & Industrial and Production Engineering Dr B R Ambedkar National Institute of Technology. Jalandhar, Punjab*,on **Innovative Pedagogical Practices for Engineering Graphics (IPPEG)** at National Institute of Technology Calicut from 07/03/2025 to 11/03/2025.



Dr B R Ambedkar National Institute of Technology
Jalandhar, Punjab, India

Department of Mechanical Engineering and
Department of Industrial & Production Engineering

Certificate of Participation
awarded to
VYSAKH RAVEENDRA KURUP
from
TKM INSTITUTE OF TECHNOLOGY, KARUVELIL, EZHUKONE, KOLLAM

For participating in the 5-day Faculty Development Programme on ***"INNOVATIVE PEDAGOGICAL PRACTICES FOR ENGINEERING GRAPHICS"*** held from March 07-11, 2025 organized jointly by the Department of Mechanical Engineering and the Department of Industrial & Production Engineering, Dr B R Ambedkar National Institute of Technology Jalandhar, Punjab, India

Dr Nitin Sharma
Assistant Professor (ME)
Course Coordinator

Dr Rakesh K. Sharma
Assoc. Professor & HOP (IP)
Course Convenor

Prof. T. Srinivas
Professor & HOD (ME)
Course Convenor

- Dr. Mubarak M. attended and presented two conference papers on the 2nd global conference on Decarbonizing India held at National Institute of Technology, Calicut , Kerala on 7-8 March 2025

GCDI '25

2nd Global Conference on Decarbonizing India
Towards Achieving Net Zero
March 7 - 8, 2025

National Institute of Technology Calicut, Kerala, India

CERTIFICATE OF PARTICIPATION

This is to certify that **Dr Mubarak M, TKM Institute of Technology Kollam** has presented a paper titled **Experimental Design and Kinetic study of Transesterification of Waste Cooking Oil Using NaOH as Catalyst,** Paper ID: **138** in GCDI '25 held on 7 – 8 March 2025 at NIT Calicut.

Organized by

Prof. A Shaija
Chair, GCDI '25

Dr. R Panneerselvam
Co-chair, GCDI '25

GCDI '25

2nd Global Conference on Decarbonizing India
Towards Achieving Net Zero
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National Institute of Technology Calicut, Kerala, India

CERTIFICATE OF PARTICIPATION

This is to certify that **Dr Mubarak M, TKM Institute of Technology Kollam** has presented a paper titled **Performance, Emission and Combustion Analysis of Diesel Engine at Different Fuel Injection Pressures Using Diesel as Fuel,** Paper ID: **94** in GCDI '25 held on 7 – 8 March 2025 at NIT Calicut.

Organized by

Prof. A Shaija
Chair, GCDI '25

Dr. R Panneerselvam
Co-chair, GCDI '25