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MAIT, DELHI Vol. 12, January 2022

The Head's Desk

It is a matter of great pride and privilege for me to be associated with the Department of Mechanical and Automation Engineering for this 19th year. Year 2019-20 has been a year of accomplishments for the Department. We got Accreditation status from NBA. Three of the faculty members of the Department received their PhD degrees from reputed institutes viz. NIT Kurukshetra and DTU. The Department organized Faculty Development programme in which faculty of other institute from NCR participated. A course on SCILab organized by us with the help of NMEICT, IIT Bombay benefitted number of teachers of various schools of Delhi. A large number of faculty members and students presented their research papers in various conferences in Delhi, Pune and Hyderabad.

This year we organized industrial visits almost every fortnight for the students. Two national seminars, sponsored by CSIR and GGSIPU, respectively were organized by the Department. Number of lectures have been also arranged by ASHRAE society and SAE Collegiate Club of MAIT.

Dr. V. N. Mathur

Faculty Corner

Mr. Sumit Joshi completed his PhD in *"Tribological behaviours of magnesium alloy sector shape pad with surface modification"* from Delhi Technological University, in December 2020.

ASHRAE, Student Chapter MAIT

Membership Number: 8370536

The ASHRAE Student Chapter MAIT was started in Feb 2019. Since its inception the ASHRAE Student Chapter MAIT has witnessed exponential growth. The society was started just with 15 members under the guidance of Dr. Vaibhav Jain and its strength has been increased to 71 student members. Some of the members graduated in year 2020 and currently has 53 student members. The students of this chapter have shown extreme compassion and exuberance in discharging all the tasks taken up by them with utmost dedication and hard work. The Chapter has grown to be stronger, compassionate, tech savvy and slated to give the better engineers of tomorrow. They are continued to indulge in new, green and sustainable technological research and generated more practical experience in our society and with that work smart towards developing new models in the field of HVAC&R. As it is evident from this report, they didn't let COVID-19 to stop them from doing their best and making the best use of the time at home and keep on expanding the chapter and its activities. ASHRAE is a world-renowned organization and they only want to uphold that name by constantly trying hard to be better than before.

Dr. Vaibhav Jain

Grants to ASHRAE Student Chapter, MAIT & MAIT-SAEINDIA Collegiate Club

1. Project titled, **"Design and Development of Vapor Compression Experimental Test Rig for Training and Demonstration of Different Psychrometric Processes"** sponsored by ASHRAE, USA with funding of ***$4960*** in November 2021 (August 2021-July 2022).
2. Project titled, **"Design and Development of Ice Slurry Generator Experimental Test Rig as Training and Demonstration unit"** sponsored by ASHRAE, USA with funding of ***$4950*** in November 2021 (August 2021-July 2022).
3. Project titled, **"Air Conditioner Cum Air Sterilizer for Combined Application of Air Heating and Cooling"** sponsored by ASHRAE, USA with funding of ***$4980*** in November 2021 (August 2021-July 2022).
4. Project titled, **"Development of double skin air handling unit with active air purification system as an educational demonstration unit"** ASHRAE, USA with funding of ***$4980*** in November 2021 (August 2021-July 2022).
5. DSIR has approved a project titled ***"Development and Performance Evaluation of Green Cooling System in LPG Fuelled Vehicles"*** under the PRISM and has sanctioned an amount of ***Rs 1.97 lakh***.
6. MAIT-SAEINDIA Collegiate Club receive a grant from AICTE of ***Rs.1,00,000/- (One Lakh Only)*** under AICTE-SPICES 2020-21.

Faculty Pursuing PhD

- Mr. Anil Kumar Dahiya
- Mr. Atul Kaushik
- Mr. Naveen Solanki
- Ms. Garima Sharma
- Ms. Piu Jain
- Mr. Ramakant Rana
- Mr. Rakesh Chander Saini
- Ms. Rachna Chawla
- Ms. Surbhi Upadhyay
- Mr. Vikas Sharma
- Mr. Madhukar Chhimwal
- Mr. Anupam Thakur
- Mr. Deshdeep Gambhir
- Mr. Ashwni
- Mr. Amit Gautam
- Ms. Surabhi Lata

Webinar on "Production: Non-traditional Machining Methods"

A technical webinar on "Production: Non-traditional Machining Methods" was organized on 13th Dec 2021 for the students of Mechanical and Automation Engineering department. The event was presented in association of ACE Engineering Academy.

"Education is the ability to listen to almost anything without losing your temper or self-confidence."— Robert Frost

Research Publications

- N. Solanki, A. Arora, and R. K. Singh, "Performance Comparison of Refrigerants HFO1234yf and HFO1234ze in a Vapour Compression Refrigeration System Operating Under Fouled Conditions," 2021.
- Vipin Kumar Sharma, Modeling and analysis of a novel rotational magnetorheological abrasive flow finishing process, *International Journal of Lightweight Materials and Manufacture*, Volume 4, Issue 3, September 2021, Pages 290-301, DOI: https://doi.org/10.1016/j.ijlmm.2021.02.001
- Sachin Gupta, Performance assessment of triangular Obstacles mounted Solar Air Heater Using Taguchi Method, Journal of Engg. Research https://doi.org/10.36909/jer.ICARI.15321
- Vipin Kumar Sharma, Sri Kant Rana, Roop Lal and Ramakant Rana, "Wear and Residual Stress Analysis of Waste Sea Shell and B4C Particles Reinforced Green Hybrid Aluminium Metal Composite", *Journal of Engg. Research ICARI Special Issue, 2021*, pp. 215-224, DOI: https://doi.org/10.36909/jer.ICARI.15317
- R. Rana, L. Krishnia, Q. Murtaza, R.S. Walia, Optimizing the Machining performance of CNC tools inserts coated with Diamond like Carbon Coatings under the dry cutting environment, J. Eng. Res. (2021). https://doi.org/10.36909/jer.ICARI.15327.
- Satish kumar, Pankaj Chandna & Gian Bhushan (2021). Empirical modelling (A Green's Function) for the prediction of work piece temperature during end milling of Inconel625. Journal of Thermal Engineering, Vol. 7, No. 8, Issue 14, pp. xx-xx, December 2021,Yildiz Technical University Press, Istanbul, Turkey
- Hitesh, R. Wattal and Surabhi Lata, Development and characterization of coal fly ash through low-energy ball milling, Volume 47, Part 11, 2021, Pages 2970-2975, https://doi.org/10.1016/j.matpr.2021.05.204
- Design development and analysis of cylindrical spring with variable pitch for two wheelers, Volume 47, Part 11, 2021, Pages 3105-3111, https://doi.org/10.1016/j.matpr.2021.06.130
- Surabhi Lata and Siddharth, Sustainable and eco-friendly approach for controlling industrial wastewater quality imparting succour in water-energy nexus system, Volume 3, 15 December 2021, 100020, https://doi.org/10.1016/j.nexus.2021.100020
- Chhimwal, M., Agrawal, S., & Kumar, G. (2021). Measuring circular supply chain risk: a Bayesian network methodology. Sustainability, 13(15), 8448. https://doi.org/10.3390/su13158448
- Vikas Kumar, Gulshan Sachdeva, Sandeep Tiwari, Parinam Anuradha and Vaibhav Jain (2021), 'An Experimental Investigation on Vapor Compression Refrigeration System Cascaded with Ejector Refrigeration System', International Journal of Air-Conditioning and Refrigeration, Vol. No. 29 pp. 03, 2150028.

Online Webinar on "Problem Solving & Creativity"

Department of Mechanical & Automation Engineering along with ASHRAE Student Branch Technology organized an online webinar on "Problem Solving & Creativity" on 23rd October 2021.The event started with an introductory note by Mr. Dhruv Malhotra, President, ASHRAE student chapter who shared about the journey and achievements of ASHRAE students of MAIT. The event was graced by Prof. Victor Goldschmidt, Emeritus Purdue Professor of Mechanical Engineering, Fellow and Past Director at-Large of ASHRAE and honorary member of the IIR (International Institute of Refrigeration), ACAIRE (Colombia Association of Air Conditioning and Refrigeration, AAF (Argentine Association of Cold) and ASURVAC (Uruguay Association of Refrigeration, Ventilation, Air Conditioning and Heating)

His talk comprised of the adoption of introspection model which is needed to enrich the engineering skills. There is a dramatic difference between the problem solving techniques presented to us in formal engineering courses and the skills that are called for in actual practice. These differences will be outlined, leading towards a special focus on the need for cooperation between creativity and problem solving in engineering applications. The lecture presented the general steps in problem solving of definition, recasting, ideation, convergence, and validation/implementation. The lecture ended with a listing of 'pet-peeves' which will include confusing cause and effect and violating the scientific method. The speaker stressed on the call for creativity among engineering students. The nature of creativity, and methods to enhance creativity will then be outlined challenging each individual to personalize the comments.

SAE India Collegiate Club

FMAE BAJA – 2021

Team Jatayu, SAEINDIA collegiate club, MAIT participated in FMAE BAJA 2021 from 1st October 2021 to 5th October 2021 at Hyderabad, Telangana.

Event Name	Rank	Price Monet (Rs.)
Suspension event	**1st**	15,000/-
Rock Climb event	**1st**	10,000/-
Hill Climb	2nd	-
Endurance and Fuel Economy	2nd	10,000/-
Overall Champions	**1st**	1,00,000/-
Total Price		**1,35,000/-**

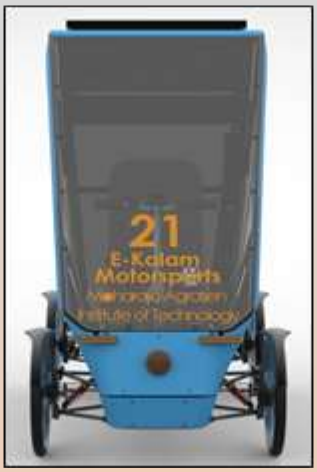
Team Jatayu secured the title of the **overall champions in India** for **FMAE BAJA 2021.**

Efficycle 2021

Team Kalam participated in SAEINDIA NIS Efficycle 2021 in virtual mode from 13th November 2021 to 21st November 2021 under the guidance of Mr. R. C. Saini.
The team has designed a 3 wheel (2F 1R) configuration vehicle in hybrid mode. Among 40 teams, Team Kalam secured 9th rank all over India.

Efficycle 2021: Effique 4-Wheel Category

Team Kalam Motorsports participated in SAEINDIA NIS Efficycle 2021 in virtual mode in 4-wheel category. The event was held from 13th November 2021 to 21st November 2021. In this event, the team designed the 4-wheel (2F 2R) configuration vehicle in a hybrid mode. Among 30 teams, Team Kalam secured **4th rank all over India**. They also secured **1st rank in design compliance** and **2nd rank in dynamic evaluation**.



Electric Vehicle India Expo 2021

The students of SAE Collegiate Club, MAIT received the opportunity to be exhibitors and showcase the own vehicles at the EV India Expo 2021. The team interacted with the forefront members of EV companies like Morris Garages, Mahindra, Tata Motors, Okaya and also with startups, that are coming up with brilliant innovations. A number of positive and motivating responses on the current designs were received so that the designs are easily absorbed in the industries as per their demand.

Individual Achievements

- Dr. Sumit Joshi participated & completed successfully AICTE Training And Learning (ATAL) Academy Online Elementary FDP on "Clean Energy Manufacturing: Transformation for Sustainable Development" from 04/10/2021 to 08/10/2021 at DTU, New Delhi.
- Dr. Sumit Joshi successfully completed the AICTE approved National Initiative for Technical Teachers Training (NITTT) modules (Module 1 to Module 4).

ATAL workshop on Robotics: Advances and Applications

A 5-Days AICTE sponsored workshop was conducted from 23th to 27th August 2021 in which more than 100 participants from different parts of the country participated. It was conducted on the online platform.

Chief Guest of the program was Prof. Prem Kumar Kalra, (Director, Dayalbagh Education institute), Guest of Honour of the function were Prof. Rajive Kumar (Member Secretary, AICTE) and Dr. Mamta Rani Agarwal (Adviser-I, ATAL Academy), Dr. Amit Dutta (Deputy Director, ATAL AICTE) and Coordinator chaired the function. Also, Directors of different academies, and AICTE official were also present with the participants. Adviser-I, ATAL Academy, Dr. Mamta Rani Agarwal addressed the participants about online FDP and various initiatives by ATAL Academy. It was a great Initiative by ATAL Academy.

"Happiness comes from helping others, by being with others, and by sharing, even if it's only a smile."

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