PDEU
PANDIT DEENDAYAL ENERGY UNIVERSITY
Formerly Pandit Deendayal Petroleum University (PDPU)
UGC RECOGNIZED

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Mar 2022

MECHANICAL DEPARTMENT

NEWSLETTER

THE EDITORIAL TEAM

DR ANIRUDH KULKARNI

MRS POOJA NIMAVAT

The newsletter intends to provide updates on the monthly happenings of the Department of Mechanical Engineering, School of Technology of Pandit Deendayal Energy University.

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MESSAGE FROM THE DIRECTOR'S DESK

PROF SUNIL KHANNA

DIRECTOR, SOT.

Dear Colleagues and Students:

Industry 4.0 (the fourth Industrial Revolution) encapsulates the future development trends to achieve more intelligent manufacturing. As we @ PDEU (formerly PDPU) embark on this journey towards Industry 4.0, I am Happy to Introduce the next issue of the Newsletter which not only share with all its readers the latest news and developments in the Department of Mechanical Engineering but would also be sensitizing all of us on the latest trends and developments in the Fourth Industrial Revolution.

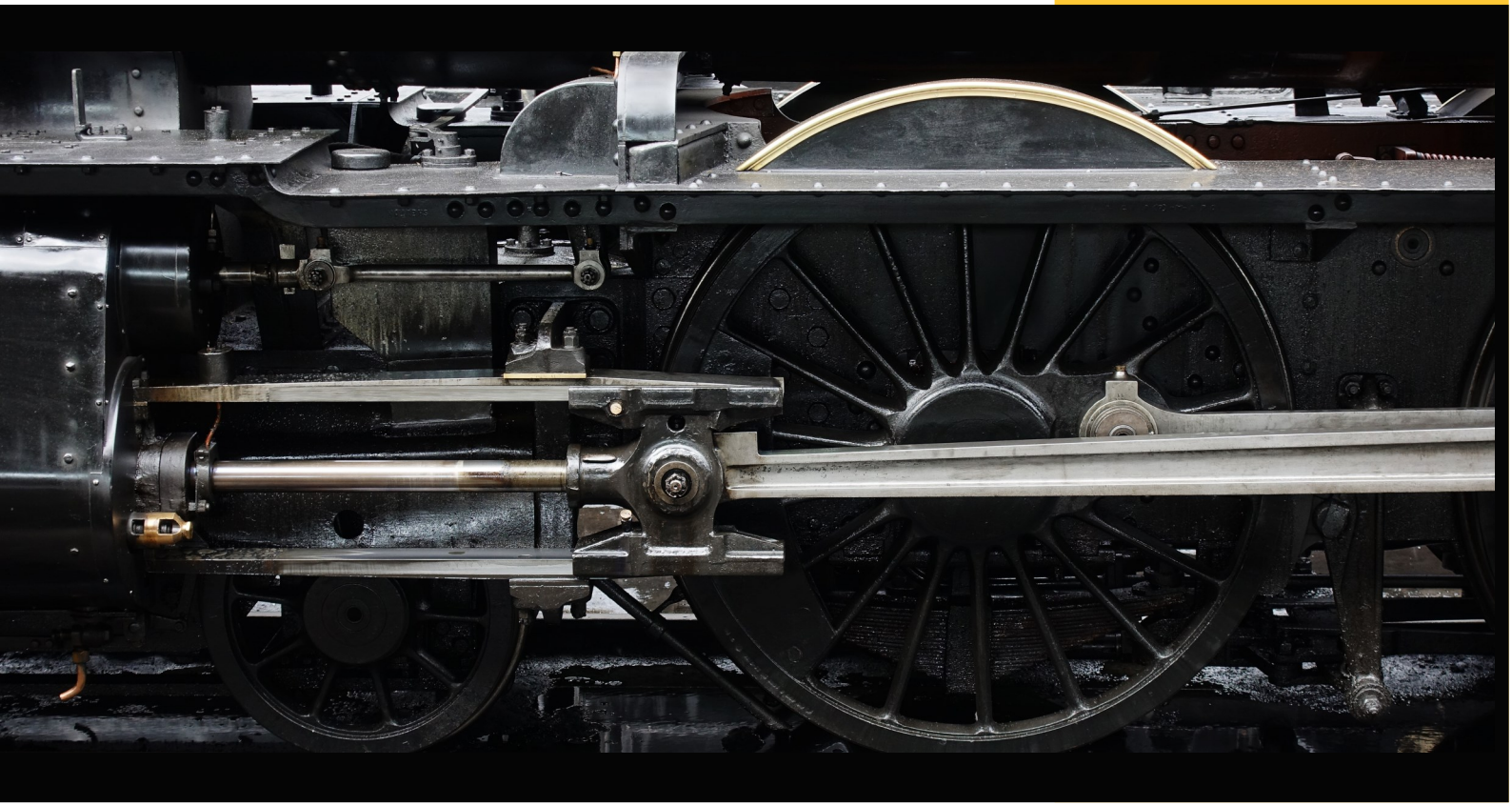
The limitless power of technology to do good and the conviction of my faculty colleagues and students that the golden age is ahead of us and not behind us brings about the best in all of us which is reflected in their achievements. Compliments to the editorial team for their passion for perfection and unbound creativity which makes me always look forward to the next edition of the Newsletter.

MESSAGE FROM THE HEAD'S DESK

PROF VISHVESH BADHEKA

HOD, DEPT OF MECH ENGG.

It gives me immense pleasure to share Newsletter of the Mechanical Engineering Department, **March 2022.** Mechanical Engineering Department is the most happening Department of the School of Technology. Newsletter gives an overview of the activities carried out by students, staff and faculties during the month. You may please share your feedback, comments & suggestions to the coordinators.



EDITORIAL

INDUSTRY 4.0 IN MANUFACTURING WITH THE FOCUS ON AUTOMOTIVE SECTOR

MR. VISHAL WANKHEDE

ASSISTANT PROFESSOR

In the manufacturing sector, advancements in science and technology always supported industrialization worldwide. Although there is no specific standard to define the industrial revolution, various changes had been observed in industries from a technological perspective over the years. These four technological changes are significantly seen as the industrial revolution. The first three industrial revolutions lasted for two centuries. In recent years, the introduction of Industry 4.0 (I4.0) technologies such as Cyber-physical systems (CPS) and the Internet of things (IoT) increased research attention among researchers from academia and industries, and also the trend of introducing these technologies has been noticed by government worldwide. Integrating these smart technologies into shop floor production will enhance operations to produce a customized product and high -quality product with increasing resource efficiency. Industry 4.0 may combine the advantages of real-time integration with the certainty of generating low waste.

The fourth industrial revolution is a technology-driven phenomenon that aims at transforming manufacturing and production systems across organizations, especially about the automotive division. The automotive industries have consistently remained at the forefront in adopting the latest technologies. The automotive industries have observed significant innovations from the introduction of the assembly line to the development of the electric car. The introduction of I4.0 provided much more opportunity to this manufacturing sector regarding the transformation of the manufacturing environment. However, many automotive organizations have not thoroughly explored these disruptive technologies. Therefore, a conceptual framework shown in Figure 1 is established to guide automotive industry practitioners towards I4.0 implementation.

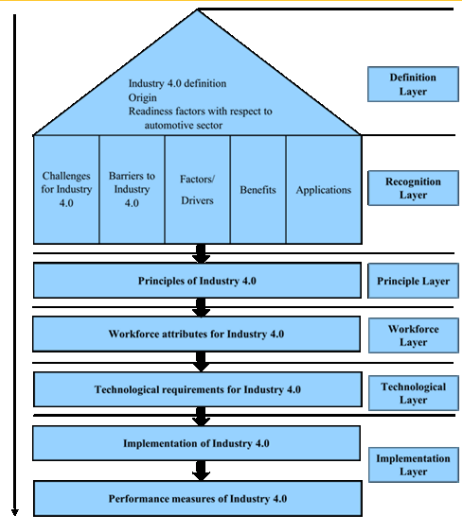


Figure 1. Proposed conceptual frame-work for Industry 4.0 implementation

INDUSTRY 4.0 IN MANUFACTURING WITH THE FOCUS ON AUTOMOTIVE SECTOR

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The framework is conceptualized by finding various implementation characteristics responsible for I4.0 adoption in automotive Industries. The developed framework consists of Six implementation layers (top to bottom). The first layer, known as definition layer, constitutes an understanding of I4.0, its origin and readiness factors with respect to automotive sector. The second layer known as the recognition layer is developed with an aim to list out various challenges, barriers, factors, drivers, benefits and applications. Next to the recognition layer, the third layer is formed as the principle layer in which various principles associated with the I4.0 adoption in the automotive industry need to be considered. The fourth layer formed is the workforce layer which depicts understanding of workforce requirements in the I4.0 scenario. The fifth layer, i.e., the technological layer, suggested requirements of I4.0 technology in the industry for successful implementation. Lastly, the implementation layer is formed that takes care of implementing all the layers mentioned above to improve the efficiency and effectiveness of production systems. Figure 2 shows the application of I4.0 in maintenance of machine.

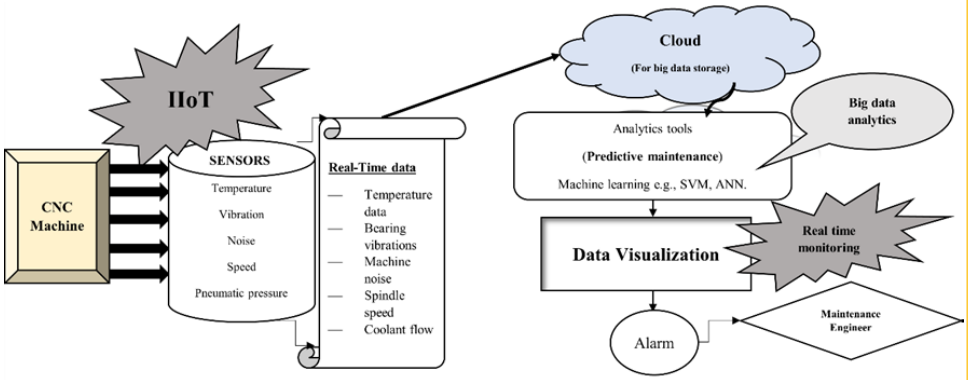


Figure 2. Industry 4.0 in Machine Maintenance

More details: https://www.emerald.com/insight/content/doi/10.1108/IJLSS-05-2021-0101/full/html

FACULTY UPDATE

Mr. Vishal Ashok Wankhede re-joined the Department of Mechanical Engineering, Pandit Deendayal Energy University on 21st March 2022 after successfully submitting Ph.D. thesis at Department of Production Engineering, National Institute of Technology, Tiruchirappalli, Tamilnadu, India.

Mr. Vishal received his B.Tech degree in Mechanical Engineering from Dr. B. A. Technological University (Govt. Autonomous), Lonere, Maharashtra, India, in 2014, and M.Tech degree in Industrial Engineering from Department of Production Engineering, National Institute of Technology, Tiruchirappalli, Tamilnadu, India, in 2016. He has successfully submitted his Ph.D. thesis (Area: Industry 4.0) at Department of Production Engineering, National Institute of Technology, Tiruchirappalli, Tamilnadu, India on 11/03/2022.

His current research interests are Industry 4.0 implementation studies, Additive manufacturing, Circular Economy, Advance manufacturing process, Optimization, Multi-criteria decision making and performance measurement. He has authored/co-authored over 25 scientific articles published in peer-reviewed journals, international conference proceedings and book chapters. He is actively associated with various professional bodies such as Additive Manufacturing Society of India (AMSI), Institution of Engineers (India), Indian Society for Technical Education, American Society of Mechanical Engineers, and Indian Institution of Industrial Engineering

FACULTY

CONFERENCE

The following conference papers were published in the Materials Today: Proceedings of 1st International Conference on Additive Manufacturing and Advanced Materials (AM2–2021) held during 04-06th October, 2021 ISBN - 2214-7853.

- GautamSingh Rajput, ***JayVora, ParthPrajapati, RakeshChaudhari,*** "Areas of recent developments for shape memory alloy: A review" presented pp. 1-5, 23rd March (2022) https://www.sciencedirect.com/science/article/pii/S2214785322017497

- ***M.B. Kiran***, "On-line measurement of tool wear of face milling cutter using machine vision", (2022) https://doi.org/10.1016/j.matpr.2022.03.509.

PUBLICATIONS

FACULTY

CONFERENCE

Dr. M. B Kiran published the following papers in Proceedings of the International Conference on Industrial Engineering and Operations Management Istanbul, Turkey, during 7th-10th March 2022:

- Smart Preventive Maintenance- A Review
- Texture Analysis of Electrical Discharge Machined (EDM) surfaces using vision system
- Tool Condition Monitoring-A Review

PATENT

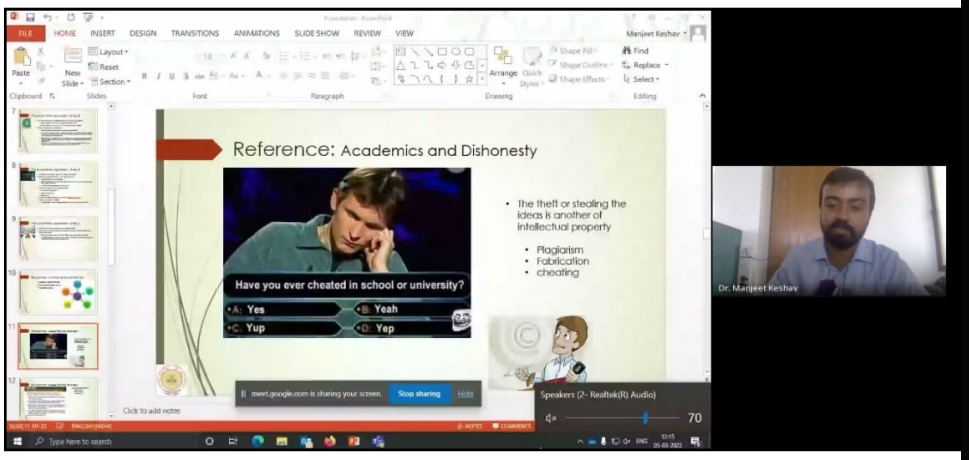
Dr. Ravi Kant filed the Design Patent titled "Bird Repelling Drone for Airports" on 9th March 2022 (Authors: Dr. Ravi Kant, Dr. Shantanu Agnihotri)

EXPERT TALK DELIVERED

FACULTY

Dr. Vishvesh Badheka delivered talk on "Maintenance Welding", during two days online technical course on Welding Fundamentals for Managers & Non-Welding Personnel, Maintenance Welding organised by The Indian Institute of Welding Mumbai Branch on 11th March 2022 and 30th March 2022.

Dr. Manjeet Keshav delivered an Online Expert Talk on "How to Choose the Right Journal and What are the Referencing Styles" during the Workshop in Academic Writing organized by Karnavati University on 5th March 2022 attended by 36 members.



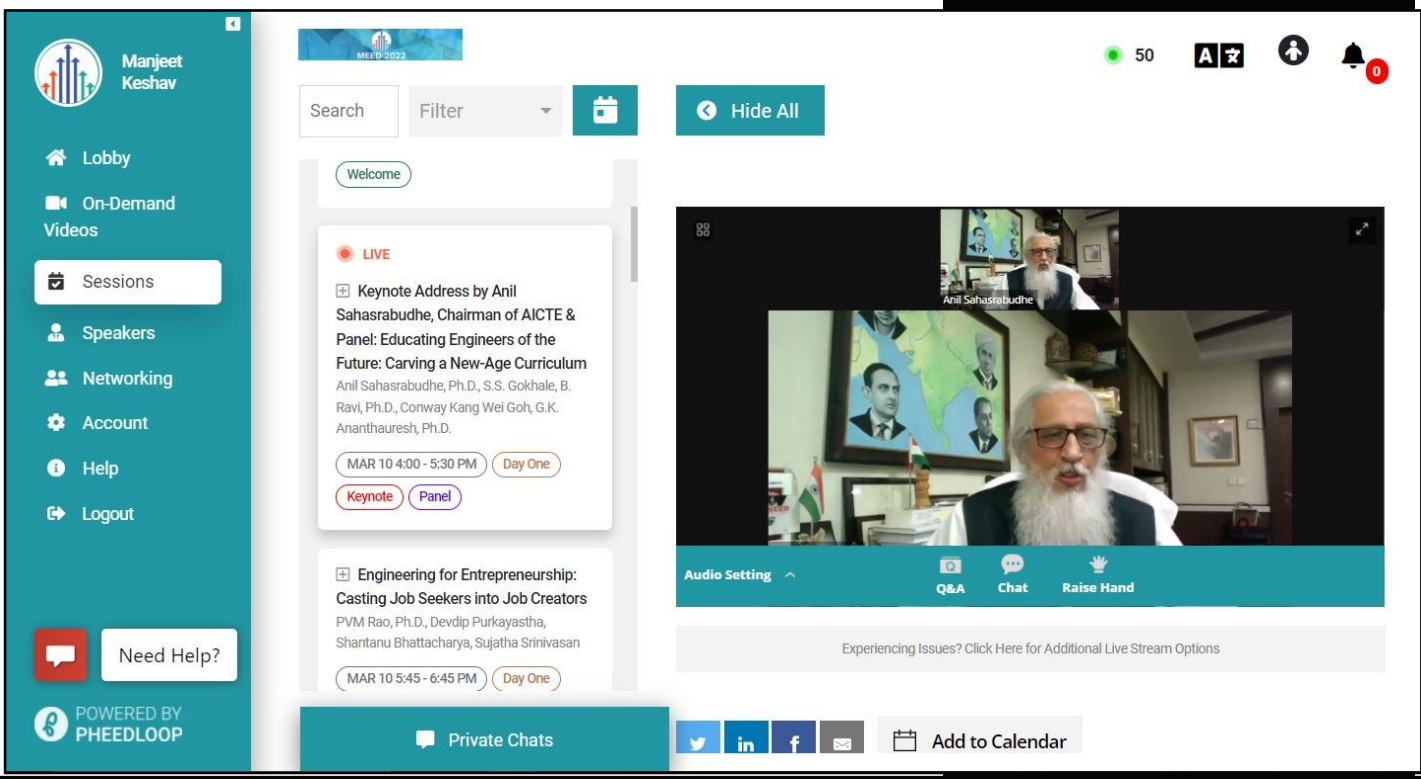
EVENTS

ATTENDED

Dr. Manjeet Keshav attended the following online events in the month of March 2022:

- Conference on "ASME International Mechanical Engineering Education Leadership Summit (MEED) " organized by ASME India during 10th - 11th March 2022.

- Seminar on "Defects in Formed Products (Rolling, Casting, Forging and Extrusion)" organized by Graphic Era University during 26th-27th March 2022.



EVENTS ORGANIZED

FACULTY

Dr. Anurag Mudgal organized "International Conference on Advances in Water Treatment and Management (ICWTM) on 25th-26t March 2022.

It included 2 Keynote Lectures by Dr. S Venkata Mohan, Senior Principal Scientist, CSIR-IICT, Hyderabad and Dr. Vinod Kumar Shahi, Senior Principal Scientist, CSIR-CSMCRI, Bhavnagar. On 25th March 2022, 4 parallel sessions and on 26th March 2022 8 parallel sessions having small invited lecture by experts followed by around 10-12 presentations were given by candidates. A total 157 presentations and 14 posters were presented. the certificates and winner trophy were given to the best presentation in each session and top three poster presentation

The Center of Excellence in Water treatment and Management was inaugurated by the dignitaries of the conference.

A few glimpses from the event are as under:











ORGANIZED

FACULTY

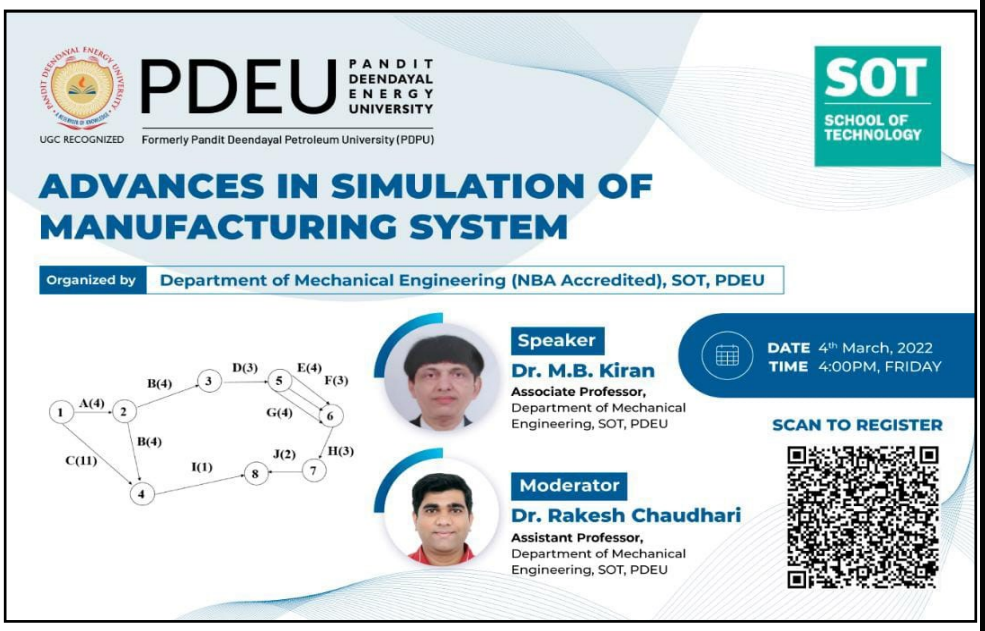
- ***Dr. Manjeet Keshav*** organized an online Industry Expert Talk, a Mentoring Session by Mr. Parth Shah, Global Project Manager, ExxonMobil on the topic "How to be plug-and-play ready for the industry" on 5th March 2022. The event was under the ASME PDEU Student Chapter and attended by 20 Students.

- ***Dr. Pankaj Sahlot*** organized an Invited-Industry Expert Talk, a Mentoring Session by Dr. Jyothish Kumar, Founder & President, Additive Manufacturing Society of India (AMSI), on 23rd March 2022. 60 students and faculty members attended the event.

ORGANIZED

FACULTY

Dr. Rakesh Chaudhari coordinated webinar by ***Dr. M. B. Kiran*** on "Advances in Simulation of Manufacturing System" on 4th March 2022.



Dr. Vishvesh Badheka organized One day workshop on Additive Manufacturing (AM) with Welding workshop on 6th March 2022. 63 students and 3 faculty members from Government Engineering College, Gandhinagar and Marwadi University, Rajkot attended program offline followed by visit to laser metal 3D printing facility. Purpose of this workshop was to share knowledge and push M. Tech admissions.

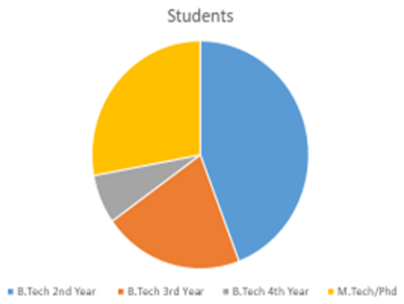
ORGANIZED

FACULTY

Dr. Vishvesh Badheka and **Mr. Kshitij Acharya** organized a 3 day workshop on Metal Additive Manufacturing on iFusion SF-1 jointly with Intech Additive Solution, Bangalore, during 11th-13th March 2022. 43 students attended workshop, including 12 M. Tech students.

Certification training on Laser 3D printer
(In house students: 3D printing module in SDP)
Date: 11th March to 13th March

- Total Students attended: 43
- Total Batches: 4 (≈ 10 students per batch)



Degree Program	Students
B.Tech 2nd Year	19
B.Tech 3rd Year	9
B.Tech 4th Year	3
M.Tech/Phd	12

ORGANIZED

FACULTY

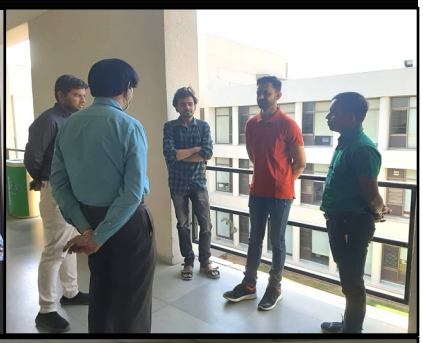
Dr. Jatin Patel organized One day Program on Scope and Opportunities of Research in Mechanical Engineering at PDEU, Gandhinagar on 12th March 2022.

Dr. Jatin Patel, Dr. Vivek Patel, Dr. Anurag Mudgal organized half day Training on Water purification for PDEU students under India-H2O project followed by visit of Center of Excellence of Water Treatment and Management on 29th March 2022.

ORGANIZED

FACULTY

Dr. Garlapati Nagababu conducted Alumni Connect Program on 17th March 2022 wherein Alumni shared their memories at PDEU, their experience in current endeavours and suggested the current final year students to connect with them to explore the future possibility of job placements, comprehensive projects and industrial training. Then, they were taken to visit the recently developed Additive Manufacturing Laboratory having 3D metal printing and other cutting edge manufacturing facilities followed by lunch.



ORGANIZED

FACULTY

Dr. Vishvesh Badheka arranged the following visits for students during March 2022:

- coordinated the visit for students of M. Tech Manufacturing Technology First Year (MTMM21) to Innovation Incubation Centre on 9th March 2022.
- Invited students from the B. Tech Mechanical and Automobile (2nd, 3rd, 4th Year) and M. Tech Mechanical - Thermal Engineering, Design, Manufacturing Technology (1st, 2nd Year) to visit the AMTC Lab at F-001 coordinated by **Mr. Kshitij Acharya**. The time-table was designed in such a way that it doesn't disturb the academics of the students. Total 15 batches were accommodated under this. 65 number of students visited facility during 14th – 18th March 2022.
- Arranged knowledge sharing session between B.Tech and M.Tech students on 14th March 2022.

ATTENDED

FACULTY

The following faculty members presented in the 2nd Faculty Research Symposium organized by Office of

Name of Faculty	Topic
Mr. Bhasuru Abhinaya Srinivas, Dr. G Nagababu and Prof. S. S. Kachhwaha	Wind and wave energy resourse assessment and climate change studies.
Prof. S. S. Kachhwaha	Experimental Studies On Biodiesel Production Using 100 L/Batch Capacity Hydrodynamic Cavitation Reactor
Dr. Ravi Kant	Fluid flow instability over a cylinder using OpenFOAM
Dr. Rajat Saxena	Phase change materials (PCMs) utilization for thermal management and energy conservation applications
Dr. Kishan Ashok Fuse and Dr. Vishvesh Badheka	Dual sided composite formation in Al 6061/B4C using novel bobbin tool friction stir processing
Dr. Krunal Mehta and Dr. Vishvesh Badheka	Tribo-electric Nano-Generators (TENG) for harvesting Energy sustainably
Dr. Jaykumar Vora	Wire arc additive manufacturing (WAAM) - the technology of future
Dr. Abhishek Kumar	Magnetic Field Assisted Finishing (MFAF) Process for Internal Finishing of Alumina Ceramic Tube
Dr. Vishvesh Badheka	A study of build orientation on SS316L parts built using Laser Powder Bed Fusion process and it's future scope
Dr. M.B. Kiran	Friction Stir Welding Inspection
Dr. M.B. Kiran	Shell Project- LNG Retrofit for Buses and Trucks

ATTENDED

FACULTY

The following faculty members presented in the 2nd Faculty Research Symposium organized by Office of Dean R&D and IQAC Cell, PDEU on 5th March 2022:

Name of Faculty	Topic
Dr. Vivek K. Patel and Dr. Jatin Patel	Smart steam disinfection system to fight COVID-19
Dr. Manjeet Keshav	Data-Driven Dynamics Model of Magnetorheological Damper
Dr. Jaydeep Patel	Wind farm layout optimization using modified Heat Transfer Search Algorithm
Dr Anirudh Kulkarni	Assuming 2D instead of 3D in CFD? Thing again!
Mr. Rahul Deharkar	Investigation On Detachable Vertical Tube Evaporator For Small Scale Multi Effect Distillation System
Dr. Pankaj Sahlot	Advances in Metal Additive Manufacturing (AM): An Experimental and Numerical Study
Dr. Nirav Patel	On the crushing behavior of Scutoid based Bio-inspired Cellular Structure
Dr. Ramesh Guduru	Energy And Environment Research With Emphasis On Nanomaterials/Nano Technologies
Dr. Pavan Gurrala	Triply Periodic Minimal Surface: A case study
Dr Vinay Vakharia	Fault severity classification of ball bearing using SinGAN and deep convolutional neural network
Dr. Rakesh Chaudhari	Optimization of MWCNTs-mixed WEDM parameters of Nitinol SMA

STUDENT

DC Review	Date	Name of PhD Scholar	External Expert	Guide/ Supervisor
1st DC	9th March 2022	Anita Kokate (21RME009)	Dr. Purnanand V. Bhale	Prof. S.S Kachhwaha
Synopsis	25th March 2022	Vipulkumar Dave (16RME007)	Dr. M. A. Popat	Dr. Vinay Vakharia
Synopsis	29th March 2022	Hardik Vyas (18RME009)	Dr. Manoj Kumar Gupta	Dr. Kush Mehta, Dr. Vishvesh Badheka
Synopsis	29th March 2022	Raghavendra Darji (18RME008)	Dr. Manoj Kumar Gupta	Dr. Kush Mehta, Dr. Vishvesh Badheka

@ PDEU

FACULTY

Dr. Vishvesh Badheka coordinated the following visits at Department of Mechanical Engineering:

- Mr Vipul K. Patel, Assistant professor, Mechanical Engineering Department, GEC, Patan performed experiments at Welding Research lab during 7th-11th March 2022.
- Mr. Kedar Badheka, Mr Ankit Shah, Mr Nirmal Patel, PhD scholars registered with GTU visited Welding Research lab, on 9th March 2022.
- Mr Jignesh Dave, Faculty and students from CIPET visited Welding Research lab on 15th March 2022.

- Mr Chintan Dave, Director, Unicus Tech Science Pvt Ltd, Sarkhej, A'bad along & team visited for technical discussion on Tribo Tester on 31st March 2022, coordinated by ***Dr Krunal Mehta***.

OUTSIDE PDEU

FACULTY

Dr. Vishvesh Badheka carried on the following professional activities during March 2022:

- attended Doctoral Progress Committee meeting of the candidate under GTU as a subject expert on 2nd March 2022.
- interacted with Mr. Shaurin Patel, Co-founder, Vexma Technologies Pvt. Ltd, Vadodara on 26th March 2022, regarding ongoing M.Tech (Design) CP .
- three shortlisted M. Tech (Design) students appeared for CP project interview with Godrej & Boyce Mfg. Co. Ltd, on 19th March 2022. Mr. Harshit Modi has been selected for one year CP from 1st June 2022. Activity jointly coordinated by ***Dr Krunal Mehta.***
- Visited 8th Engi Expo 2022 held at Vadodara on 26th March 2022.
- Attended 175th year of IIT Roorkee Alumni meet held at IITGn on 27th March 2022.

OUTSIDE PDEU

FACULTY

Dr. M. B. Kiran interacted with the following companies for providing placement assistance to final year B. Tech and M. Tech (Mechanical Engg) students during the month of March 2022:

- Electrotherm (India) Ltd., Ahmedabad,
- ISGEC Hitachi Zosen Ltd, Ahmedabad,
- Pressure Jet Systems Pvt Ltd, Ahmedabad,
- Zydus Cadila Healthcare, and Ahmadabad.
- Adani Wilmar Limited, Ahmedabad, Gujarat,
- A M Designs Pvt Ltd, Ahmedabad, Gujarat,
- Bharat Fritz Werner's Limited, Bangalore,
- Mico (Bosch) India Limited, Bangalore,
- SPC Life science Pvt. Ltd., Ankleshwar, Gujarat
- RRB Energy Ltd., Chennai.

ADMINISTRATIVE ASSIGNMENTS

FACULTY

Dr. Vishvesh Badheka took up the following administrative activities during March 2022:

- Attended COHOD meeting on 3rd March 2022.
- Attended IIC proposal review meetings on 5th March 2022 and IIC board meeting on 30th March 2022.
- Participated in CSC visit to PDEU campus on 9th March 2022.
- Attended department Alumni meet 17th March 2022
- Attended Automobile lab staff and faculty recruitment interview held on 17th and 22nd March 2022 respectively.
- Coordinated AE20, AE21 offline meeting with ***Dr. Parth Prajapati*** and faculty advisors held on 25th March 2022.
- PhD admission interview held on 25th March 2022 coordinated by ***Dr. S.S Kachhwaha, Dr. Abhishek Kumar and Dr. Manjeet Keshav.***
- Attended department meeting held on 25th March 2022.

Dr. Manjeet Keshav conducted Mid-Semester review of M. Tech Dissertation and Seminar from 21st - 25th March 2022 as PG Coordinator M. Tech Design.

Dr. Pavan Gurrala conducted the demo of DLP printer in PG research lab on 23rd March 2022.

FACULTY

Dr. Pavan Gurrala conducted the demo of DLP printer (62µm Print Precision SPS™ Smart-Positioning-System Technology Open Material System, 385nm UV LED) installed at PG research lab on 23rd March 2022.

RECOGNITION

STUDENT

- **Aman Sorathiya (20BME042)** received Best shooting award in National Cadet Corps (NCC), CATC Camp from 9GUJBNNCC.

- **Mukesh Chavda (19BME077),** SUO (Senior Under Officer), National Cadet Corps (NCC) received a gold medal for recognition as "Best Company Leader" from CEO (A Rank in Army).