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

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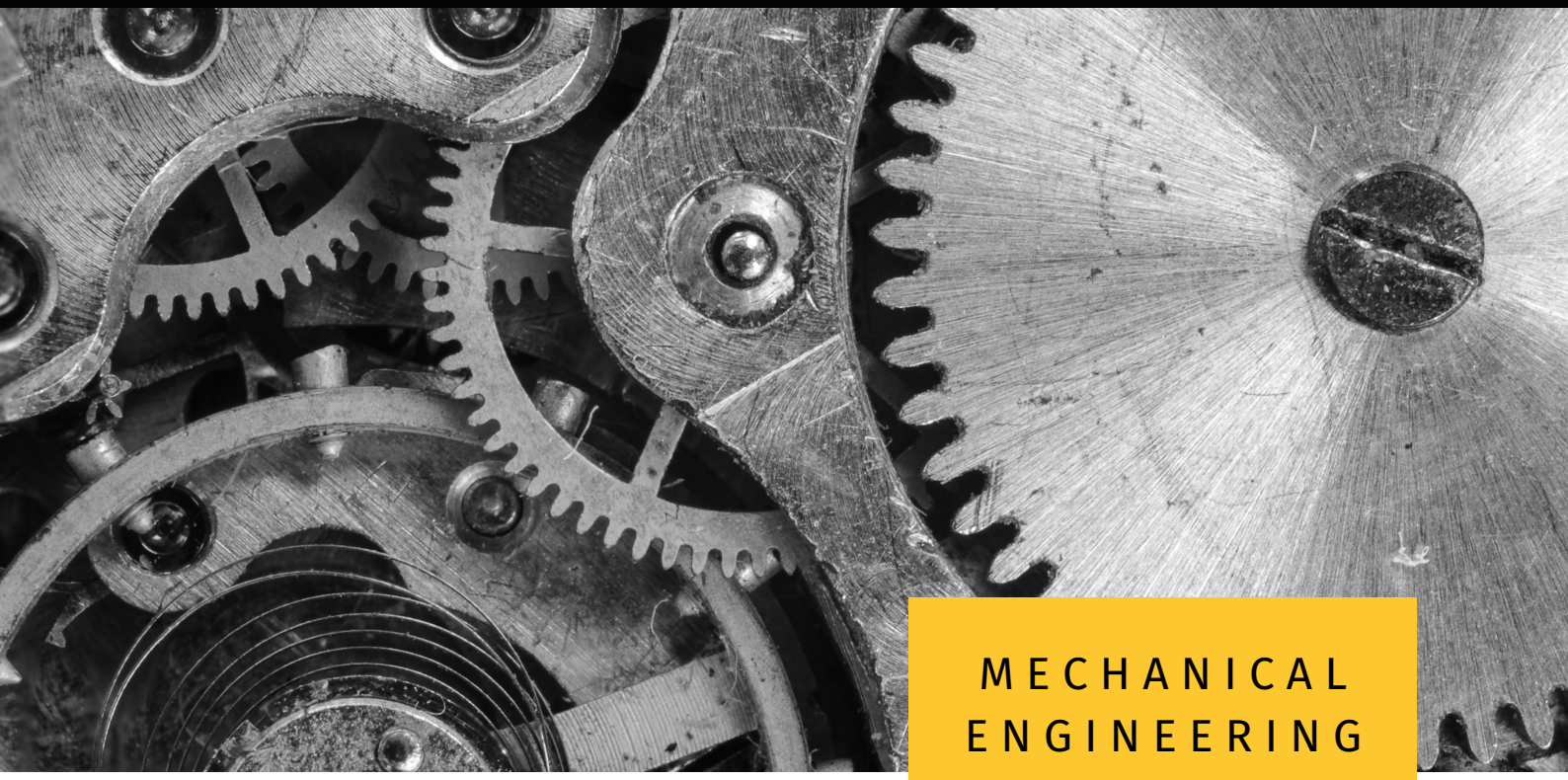

NEWSLETTER

Dr ANIRUDH KULKARNI

ASSISTANT PROFESSOR

The newsletter intends to provide updates on the monthly happenings of the Department of Mechanical Engineering, School of Technology of Pandit Deendayal Energy University. It includes all the information pertaining to faculty, staff, and student activities.

MECHANICAL ENGINEERING

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MESSAGE FROM THE DIRECTOR'S DESK

Prof SURENDRA KACHHWAHA

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.

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MESSAGE FROM THE HEAD'S DESK

Prof VISHVESH BADHEKA

HEAD OF DEPARTMENT

It gives me immense pleasure to share Newsletter of the Mechanical Engineering Department, August 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 and suggestions to the coordinators.

EDITORIAL

Wire Arc Additive Manufacturing

Dr RAKESH CHAUDHARI

ASSISTANT PROFESSOR

In recent times, additive manufacturing (AM) was established as a promising technique for manufacturing huge, intricate designs and multiple layer deposition of dense objects. The AM technique has great potential for numerous industrial applications, which is advantageous over traditional manufacturing techniques. AM process is an extensively preferred technique for the development of objectively difficult structures without the use of a mold as it widely expands the manufacturing capability and resilience. Compared to the traditional procedure, AM technique saves roughly 50% on fabrication costs. As a result, it is regarded as a cost-effective, practicable, inventive, and dependable production technique. In recent years, advances in additive manufacturing technology have enabled the direct production of final parts. Its use is growing in various areas, including automotive, aerospace, defence, medicinal, and electronics, due to its numerous benefits. AM is majorly divided into three classifications. direct energy deposition (DED), sheet lamination, and powder bed fusion. Wire arc additive manufacturing (WAAM) with wire feedstock as the energy source was the DED process employed in AM technique. Heat sources used in the AM of solid structures consist of electric arcs, laser beams, and electron beams. The energy charge is compact and the structural behaviour is comparably accurate during the heat source of laser and electron beams. These two heat source processes of laser and electron beams utilize direct energy deposition and powder bed fusion techniques. Therefore, metal power as feedstock is essential for these techniques, which in turn limits their production efficiency. Due to this reason, the production cost of the process increases by limiting the use of laser and electron beams in the fabrication of extensive metallic structures on a larger scale.

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Electric arc as a heat source is a promising technique for the fabrication of large-scale intricate metallic structures owing to their high rate of deposition, reduced cost, and minimal wastage rate. A metal wire is employed as feedstock material in the electric arc method, and its cost relative to metal power for equal weight is very low. Therefore, the WAAM technique using an electric arc is more suitable than laser and electron beam techniques. WAAM can be obtained from various additional energy sources like plasma arc welding, gas tungsten arc welding, and gas metal arc welding (GMAW). WAAM-based technology using a GMAW source is employed for high deposition rate, favourable mechanical qualities, and low equipment cost, regardless of the typical GMAW process. GMAW-based WAAM is widely preferred due to its capability of fabricating thin multilayer structures with a lower capital cost, ease of material deposition, and high deposition rate. AM performed using GMAW allows for the manufacturing of parts through multiple-beadmulti-layer deposition, which depends on the process variables such as wire feed rate, voltage, gas flow rate, torch speed, and selection of welding path. Surface characteristics, dimensional precision, and mechanical properties of the specimen are affected by the overlapping observed between the adjoining weld beads. The parts deposited using this process cannot be used in their original state, owing to the requirement of further post-processing, such as grinding or milling whose specifications are set according to the final part. However, several challenges arise during the WAAM of metallic structures such as post-processing techniques, reduced surface quality, surface morphology, changes in microstructure, and mechanical properties. This requires additional machining to be performed. Due to the lower wastage of material during WAAM, the entire process still remains economical in comparison with subtractive machining processes. Appropriate selection of WAAM variables imparts bead geometries with characteristics of multi-layer structures.

The features of the weld geometry and dimensional precision were both affected by the process parameters of WAAM. Construction of a single-layered geometry determines the dimensional precision which is evaluated by its homogeneity and stability. As a result, suitable design variables to achieve a specified component accuracy are essential and critical for WAAM. Incorrect selection of design variables will result in eminence issues such as partial fusing, hump, and porosity. Parts with serious flaws will have their mechanical characteristics drastically reduced. Furthermore, past studies often employed the design variables that were selected from a specified range. As a result, adjustment of processing parameters that impact weld bead geometry and quality in the construction of multi-walled components needs to be considered. Thus, it is essential to optimize the design variables of the WAAM process. Optimized parameters give a good quality of properties to the final components.

FACULTY

JOURNAL PUBLICATIONS

- **Jay Vora**, Heet Parmar, **Rakesh Chaudhari**, Sakshum Khanna, Mikesh Doshi, Vivek Patel, “Experimental investigations on mechanical properties of multi-layered structure fabricated by GMAW-based WAAM of SS316L," Journal of Materials Research and Technology, Elsevier, Elsevier (Q1 Journals), Vol. -, Pg. -, IF 6.627, HI:59, August (2022).
- **Ravi Kant**, Vishal Sharma, Ramesh Bhoraniya, Narayanan Vinod ,"Receptivity and sensitivity analysis of Jeffery-Hamel flow," Sādhanā Journal, Springer, Vol. 47, Pg. 154, IF 1.347, HI:52, August (2022).

CONFERENCE PROCEEDING

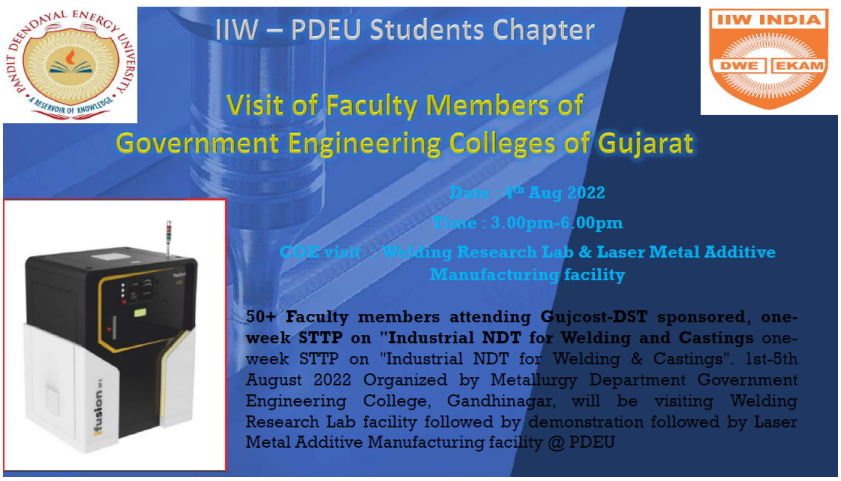
Mr. Abhinaya Bhasuru attended the following conferences:

- **Bhasuru Abhinaya Srinivas**, Parth Motka, **Garlapati Nagababu**, **Surendra Singh Kachhwaha**, “Climate change impact on wind energy potential in Rameshwaram," Innovation in Smart and Sustainable infrastructure (ISSI), Civil Engineering Department, School of Technology, Pandit Deendayal Energy University, 23 - 25 August (2022).
- **Bhasuru Abhinaya Srinivas**, Parth Motka, **Garlapati Nagababu**, **Surendra Singh Kachhwaha**,"Future Wind speed trends in the Indian offshore region," The 5th International Conference on Renewable Energy and Environment Engineering (REEE 2022), Brest university, France, 24 - 26 August (2022).

STUDENTS' CHAPTER IIW-PDEU

Visit by the faculties and professionals from GEC, Gandhinagar

On 4th AUG 2022, 53 faculties and professionals from the Government Engineering College, Gandhinagar visited Pandit Deendayal Energy University under the aegis of IIW-PDEU Students chapter. The faculties from all over the state gathered for a DST sponsored one-week STTP on Industrial NDT for Welding and Castings organized at the GEC, Gandhinagar. Visit to PDEU was a part of the end of the event activity wherein the faculties visited the Welding Research Laboratory. At WRL, they were demonstrated the all the various welding techniques established at the lab. It included the advanced solid state welding processes FSW, Friction welding etc. After the demonstrations the participants were given exposure to the Metal Additive Manufacturing facility at the AMTC laboratory at PDEU. It is a state-of-the-art facility available at PDEU, only one in an academic institution. At the end of the visit everybody gathered at the lecture hall for the vote of thanks but before that Dr. Vishvesh Badheka gave a talk on the activities of WRL in PDEU in brief.



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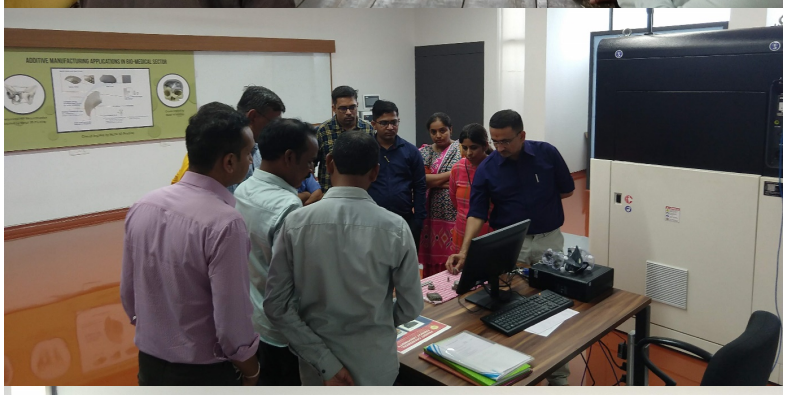

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STUDENTS' CHAPTER IIW-PDEU

Expert talk on the Metallurgy of Thermal Power Plants by R. R. Vishwakarma

R. R. Vishwakarma, Retd. Additional Chief Engineer of GEB/GSECL and consulting metallurgical engineer, visited Pandit Deendayal Energy University on 1st AUG 2022 for delivering expert talk on the metallurgy of thermal power plants to the students of Department of Mechanical Engineering. He elaborated on the types of boiler and its basic functions. He discussed about the basic systems of the boiler tubing and the materials used in the boilers. The discussion further got elaborated into the selection of material based on the service conditions of the boiler and what are the service conditions that require attention. He also explained about the materials for the various heat exchanging elements. At the end of the one hour talk he enlightened the students about the boiling tube failures (BTFs) that take place in the boilers of the thermal power plants and how to mitigate the failures during such situations. Before the expert talk he visited the AMTC laboratory at the Translational research centre and after the talk he visited the mechanical workshop and the welding research laboratory.

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- Dr. Sarang Pande; FIE, Chairman, The Institution of Engineers India, Saurashtra Local Center, Rajkot. Professor (Mechanical Engineering), Marwadi University, visited Welding Research and Metal additive Manufacturing facility along with his colleague Dr Ritesh Ramesh Palkar, Associate Professor, Department of Chemical Engineering. Dr Sarang Pande delivered an expert talk on additive manufacturing on 5th Aug.

- Advance training on Olympus microscope & Software by IR Technology Services Pvt Ltd, Mumbai conducted on 18th Aug. Training was conducted by Mr J S Pagar and Mr Dilip Kela.
- M.Tech (MTMM22) students attended online CII Weld-Tech Summit held on 24 AUG 2022 (1000 – 1400 hrs)

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FACULTY

INDUSTRY INSTITUTE INTERACTION

Prof Vishvesh Badheka carried out the following activities under Industry Institute Interaction.

- Invited as Chief–Guest during inaugural ceremony of DTE-approved, Gujcost-DST sponsored, one-week STTP on "Industrial NDT for Welding and Castings on August 1st, 2022, organised by Metallurgical Engineering Dept., GEC, Gandhinagar.

FACULTY

INDUSTRY INSTITUTE INTERACTION

Prof Vishvesh Badheka carried out the following activities under Industry Institute Interaction.

- Acted as panel member of Research Proposal Presentation Evaluation Committee for Ph.D. admission for the academic year 2022-23 for the candidates in Metallurgy Engineering discipline on 17th Aug, online.
- Attended GSFC University - 8th Board of Studies Virtual Meeting - B. Tech. Mechanical on 2nd Aug.
- External DC reviews as subject expert: Attended DC-II of two candidates at L D College of Engineering on 10th Aug and Research Advisory Committee (RAC-V) meeting of of PhD scholar registered with Mechanical Engineering Dept., Nirma University on 25-Aug-2022
- Visited Dr. Mukti Ranjan Jana, Scientific Officer G, Neutral Beam Injection (NBI) Group of IPR, Gandhinagar on 12th Aug regarding technical interaction on friction welding application.
- Mr. Ashish Yadav, ITER-India, visited Welding Research and Metal printing facility on 12th Aug during second half and explored the possibility of printing of component.

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FACULTY

INDUSTRY INSTITUTE INTERACTION

A small delegation headed by Mr. Amit Srivastava (HEAD, CAE, TATA AUTOCOMP SYSTEMS LIMITED), visited PDEU Campus for placement and interaction on 27-08-2022. This meetup was coordinated by Prof Vishvesh Badheka, Dr Krunal Mehta, and Mr Vineet Bagaria (CD Cell, PDEU). The interaction session was scheduled at Workshop, PDEU, with the departmental representation. Following were key-points of the interaction:

- Visit to the departmental facility, particularly relating to Workshop.
- Brief about department by Prof. Vishvesh Badheka.
- Brief about TATA AUTOCOMP SYSTEMS by Mr. Amit Srivastava
- Mr. Amit Srivastava showed interest to set-up a COE in the domain of CAE with the help of industry partners. The center primarily will focus towards advanced modelling and analysis of industrial components.
- Mr. Amit also showed interest for internship/project for B.Tech and M.Tech. Students

FACULTY

ADMINISTRATIVE ASSIGNMENTS

An expert National Board of Accreditation (NBA) team visited the mechanical engineering department on 27th August. Earlier the department was accreditated by the NBA until June 2022. A compliance report based on the comments was submitted online in January 2022 based on the comments by another expert team who had visited the department earlier. The team thoroughly investigated the submitted files, and the visit lasted an entire day. The whole visit was coordinated by NBA Coordinator Dr. Nirav Patel, Dean FOET Dr. Rajesh Patel, and ME HOD Prof. Vishvesh Badheka.

Prof. Vishvesh Badheka carried out the following administrative assignments:

- First phase of the screening for the recruitment of faculty position carried out on 4th Aug.
- Expert Member in the Selection Committee for the recruitment of faculty position for Mechanical Engg department during 16-17th Aug 22.
- Expert advice/talk by Professor H. K. Raval of SVNIT, Surat held online on 2nd Aug regarding NBA team visit to Mechanical department on 27th August, 2022.

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STUDENTS

ALUMNI CONNECT

Mr Priyanka Dhyani (14BMEN024) & Palak Patel (15BME 087) visited dept. and address final year students regarding higher studies abroad and followed QA.

STUDENTS

DC CONDUCTED

Name and Roll no.	Industry Company Name	Duration of Internship	Work Done
Jani Hardik Kirtanbhai (19RME002)	Prof.Surendra Singh Kachhwaha and Dr.Garlapati Nagababu	Prof. N. M. Bhatt	Synopsis Presentation held on 22 Aug at 3.00 PM.
Vaghasia Vatsal Maheshkumar (21RME001)	Dr. Jay Vora and Dr. Rakesh Chaudhari	Prof. Indravadan Dave	Comprehensive Exam and 2nd DC Review held on 30 Aug at 2.00 PM.
Sanjay Ranjan Tiwari (21RME003)	Prof. Surendra Singh Kachhwaha and Dr. Pravin Kodgire	Dr.Nirav I. Jamnapara	Comprehensive Exam and 2nd DC Review held on 29 Aug at 2.30 PM.
Amruta Mahajan (21RME005)	Prof. Vishvesh Badheka	Dr. Paritosh Cahudhuri	Comprehensive Exam and 2nd DC Review held on 8 Aug at 3.00 PM.
Kshitij Acharya (21RME006)	Prof. Vishvesh Badheka and Prof.Chaitanyamoy Ganguly	Dr.Jyoti V. Menghani	Comprehensive Exam and 2nd DC Review held on 8 Aug at 11.00 AM.
Darshan Bhatt (21RME008)	Dr. Pankaj Sahlot and Dr.Jay Vora	Prof. Indravadan Dave	Comprehensive Exam and 2nd DC Review held on 30 Aug at 2.50 PM.
Kokate Anita Vishnu (21RME009)	Prof. Surendra Singh Kachhwaha and Dr. Pravin Kodgire	Dr. Purnanand V. Bhale	Comprehensive Exam and 2nd DC Review held on 4 Aug at 2.00 PM.
Madhavi B Acharya (22RME001)	Prof. Vishvesh Badheka	Dr.Jyoti V. Menghani	DC Review held on 8 Aug at 1.00 PM.

STUDENTS

INDUSTRIAL INTERNSHIP

The students from 20BME and 20BAE groups carried out voluntary industrial training. Details of this training are provided in the table below.

Name and Roll no.	Industry Company Name	Duration of Internship	Work Done
Parthiv menpara (20BME141D)	JOYTI CNC PVT LTD.	28 days	Assembly in cnc and vmc also hmc machine and casting process or sheet metal process machining process also done
DEV KAHODARIYA (20BME064)	NTPC Ltd.(National Thermal Power Corporation)	30 days	Gas and Steam Turbine Plant Training
Patel Yagna Bhupendra (20BME139D)	BOMAFA - special valve solution pvt ltd.	42 days	Apprenticeship under production engineer and worked in assembly department.
Smit patel (20BME059)	TOYOMO ADVANCED MATERIALS	15 days	Making FRP(Fiber Reinforced Plastic) products and assamble die according to design that we have to make final product.
Kush patel (20BME081)	Technook	60 days	Car design (on solidwoks)
Anuj Shah (20BME097)	Jay Copper & Alloys	30 days	Machine design, component design and analysis, equipment maintenance, quality department, and equipment procurement.
Nair Kartik Anil (20BME057)	OLA Electric	30 days	Checkup of vehicles and also worked in software update team
Harsha Sarma (20BME041)	Hitachi	30 days	Worked in manufacturing and assembly of different components of Air conditioner, also worked in scrap reduction project in the manufacturing of coils and fins

STUDENTS

INDUSTRIAL INTERNSHIP

Name and Roll no.	Industry Company Name	Duration of Internship	Work Done
Vishesh Raisinghani (20BME154D)	M/s R.G.Bhawnani - CASE Authorized dealers.	14 days	Maintenance and service of heavy earthmoving machineries
Shilp Jaymin Valand (20BME094)	Magnus Industrial Corporation	30 days	Work related to various machining processes
Makwana Gaurang Pravinbhai (20BME058)	Flotec Technosmart India Pvt. Ltd	15 days	Has Done Various Type of Industrial valve testing Procedures and Different techniques.
Rushang Kulkarni (20BME135D)	Tata motor passenger vehicle, sanand	30 days	Worked under welding department specifically under BIW
Utsav Talaviya (20BME065)	IIT Delhi (summer research fellow)	45 days	Industrial helmet designing
Meet Lakhani (20BME035)	GEMCARE APPLIANCES PRIVATE LIMITED	33 days	I have worked in maintenance department in which I get to know about different components use in refrigerator manufacturing.
Darshit Gandhi (20BAE013)	Amber Automobiles	15 days	Ground work

STUDENTS

DC CONDUCTED

- Jani Hardik Kirtanbhai (Roll no: 19RME002)
- Vaghasia Vatsal Maheshkumar (Roll no: 21RME001)
- Sanjay Ranjan Tiwari (Roll no: 21RME003)
- Amruta Mahajan (Roll no: 21RME005)
- Kshitij Acharya (Roll no: 21RME006)
- Darshan Bhatt (Roll no: 21RME008)
- Kokate Anita Vishnu (Roll no: 21RME009)
- Madhavi B Acharya (Roll no: 22RME001)

REPORTS

PARENT TEACHER MEETING

A Parent-Teacher meeting was conducted on 20th and 22nd August, 2022 for both the Mechanical and Automobile Engineering Students. The third and fourth year students and their parents were invited on 20th, while the second and third year automobile engineering and second year mechanical engineering students were invited on 22nd. Here are some event highlights

- 50+ Parents attended the meeting.
- Event started with faculty introduction to parents followed with brief introduction of parents. Parent's teacher meeting held with at E 203 room number.
- Visit to Translational research centre to showcase the metal 3D printing facility.
- Department student development activities highlights shared by Head of department.
- Brief introduction and awareness about various students Chapters and clubs activities and achievements in department.
- Summary of Career development activities involving Industrial Orientation, Comprehensive projects, Placement records.
- Alumni Interaction and experience sharing.

  Mr. VaideekChaudhary MC14 Batch Currently residing/working in Australia

  Miss. Palak Patel MC15 Batch Currently a Phd scholar at M.I.T

  Mr. Ashish Dani MC15 Batch Currently pursuing MBA at IIM Udaipur

  Mr. Mann Patel MC17 Batch Currently working in DeNora, Mumbai

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PARENT TEACHER MEETING

Director SOT: Prof. Surendra Singh Kachhwaha, welcomed the parents to PDEU campus. He informed about the vision and mission of the university along with PSO's of the department.

MEHOD: Prof. Vishvesh Badheka, welcomed parent for the parent's teacher meeting. He presented details of the campus facilities, Centre of excellence, research labs and academic activities carried out by department to ensure overall development of students. He elaborated about the skill development programs carried out for students, its participation statistics and benefits to students. He urged parents to encourage parents to participate in such events for their own development.

Following MEHOD speech, coordinator's elaborated about student's activities and their statistics to parents.

- Student Chapter & Clubs: Rahul Deharkar
- Industrial Orientation: Dr. Kishan Fuse
- Comprehensive Projects: Dr Anirudh Kulkarni
- Career Development Cell: Dr. Krunal Mehta
- PTM Co-coordinator: Rahul Deharkar

REPORTS

PARENT TEACHER MEETING

Parents visit to Metal 3D printing facility

S S Kachwaha addressing the parents

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