

KCG COLLEGE OF TECHNOLOGY

Karapakkam, Chennai- 600097

Departments of MechatronicsEngineering

Report of the Faculty Development Programme

Integration of Automotives and Smart Mechatronics System for Sustainable Mobility

31st Jan to 4th Feb 2024

[Conducted through Hybrid Mode]

The Faculty Development Programme on "Integration of Automotives and Smart Mechatronics System for Sustainable Mobility" was organized by the Departments of Mechatronics Engineering and Automobile Engineering. The program aimed to provide insights into the integration of automotive systems and smart mechatronics for sustainable mobility. **The sessions covered various aspects, from automotive design to the application of advanced technologies in the automobile industry.**



The poster for the Faculty Development Program on "Integration of Automotives & Smart Mechatronics System for Sustainable Mobility" is organized by the Department of Mechatronics & Automobile Engineering. It features a grid of sessions with resource persons, a QR code for registration, and event details.

Faculty Development Program on
Integration of Automotives & Smart Mechatronics System for Sustainable Mobility

Organised by
Department of Mechatronics & Automobile Engineering

RESOURCE PERSONS

	10:00 AM to 12:00 Noon	2:00 PM to 03:30 PM
31st January 2024	 Dr Suresh Kumar G Assoc GM-Cabin Design, Daimler India Commercial Vehicles Pvt Ltd. Integrating Automotive Systems for CASE	 Mr S. Mithun Business Analyst-System Solutions, ZF CVT India Ltd., TamilNadu. Exploring Sustainable Innovations in Automotive Braking Systems: A Green Approach to Transportation Safety
1st February 2024	 Mr Silambarasan Deputy Manager Design (Passenger Car & Utility Vehicles) Wheels India Ltd., Chennai Smart & Sustainable Automotive Parts Manufacturing Systems	 Mr Gowtham Rajmohan Sr. Application Engineer-MATLAB, ARK Infosolutions Pvt Ltd, Chennai Application of MATLAB in Mechatronics - Research Oriented
2nd February 2024	 Dr Vivek Ashokan Regional Manager-MATLAB, ARK Infosolutions Pvt Ltd, Chennai Application of MATLAB in Automotive Systems - Research Oriented	 Mr Shravan Kumar Program Planning & Production Control, BMW Group, Chennai Sustainability in Automobile Industry
3rd February 2024	 Dr Shankar Ramachandran AGM-EV Operations, Switch Mobility Automotive India Ashok Leyland Group Technology Advancement in EV towards Sustainability	 Mr Jeffin Job Technical Lead- Vehicle Dynamics, Tata Technologies, Maharashtra Vehicle Handling Attributes for Sustainability
4th February 2024	 Prof. Balaji.B Prof. of Practice, IIT Madras Charging Ahead: Electric Vehicles and Sustainable Mobility Ecosystem	 Scan to Register

31st Jan - 4th Feb 2024 | **10:00 AM to 3:30 PM** | **F14 Seminar Hall**

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The Faculty Development Program (FDP) Inaugural Function held on 31st January 2024 marked a significant milestone, bringing together distinguished speakers, industry experts, and academia to foster knowledge **exchange and collaboration in the field of automobile technology and Mechatronics Technology**. The event was organized with meticulous planning, and it unfolded seamlessly, creating a valuable platform for participants.

The welcome address by Dr. T. Mothilal, Head of the Department of Automobile, set a positive tone for the event. His remarks highlighted the importance of the FDP and provided participants with an insightful overview of the program's objectives. Dr. Mothilal's warm welcome created an inclusive atmosphere, encouraging engagement and participation.

The principal had interacted with all the Resource persons before the beginning of each and every session.

Dr. G. Prabhakaran, Dean Academics at KCG College of Technology, delivered an insightful address focusing on the academic aspects of faculty development. His remarks emphasized the alignment of educational programs with industry needs and the importance of fostering strong collaborations between academia and the corporate sector.

A highlight of the event was the special address by Dr. G. Suresh Kumar, Associate GM - Cabin Design, Daimler India Commercial Vehicles Pvt. Ltd. He shared invaluable insights into industry perspectives and practices in cabin design, offering participants a glimpse into the latest trends, challenges, and innovations in the automotive sector. His address provided a bridge between academic knowledge and practical industry applications.

The distribution of a memento to the Chief Guest, Dr. G. Suresh Kumar, by the Dean Academics added a ceremonial touch to the event. This gesture symbolized appreciation and gratitude for his contribution, reinforcing the collaborative spirit of the occasion.

The event concluded with a Vote of Thanks by Dr. S. Kaliappan, Head of the Department of Mechatronics. Dr. Kaliappan expressed gratitude to all dignitaries, participants, and contributors for their role in making the Inaugural Function a success.

Session I: Integrating Automotive Systems for CASE



Resource person: Dr. Suresh Kumar G, Associate General Manager - Cabin Design, Daimler India Commercial Vehicles Pvt Ltd, Chennai.

Dr. Suresh Kumar G discussed the integration of automotive systems for Connected, Autonomous, Shared, and Electric (CASE) vehicles, shedding light on the evolving trends in cabin design. He underscores the imperative integration of automotive and smart mechatronics systems, driven by the global shift towards sustainability in the automotive industry. He emphasizes collaborative creation between industries and educational institutes, aiming to foster interdisciplinary collaboration and innovation. The encouragement of such programs

stems from the philosophy of knowledge sharing and the foundational importance of understanding engineering principles. The integration focuses on creating a skilled talent pool aligned with industry needs, addressing challenges through efficient programs. Notably, the collaborative efforts extend across computing, materials engineering, and connectivity domains, contributing to advancements in the automotive sector.

Session II: Exploring Sustainable Innovations in Automotive Braking Systems: A Green Approach to Transportation Safety



Resource person: Mr. S. Mithun, Business Analyst-System Solutions, ZF CVS India Ltd, TamilNadu.

This session focused on sustainable innovations in automotive braking systems, emphasizing a green approach to transportation safety. He delves into The incorporation of a pneumatic braking system, careful selection of brake chamber size, and a well-designed basic circuit lay the foundation for optimal brake performance. Addressing wheel lock and stability

concerns, along with integrating ABS and electronic stability control technologies, contributes to improved vehicle control and safety during braking maneuvers. Mithun highlights the importance of proper sizing for reservoirs and compressors, emphasizing stability considerations for an efficient pneumatic braking system. Additionally, he underscores the critical need for reducing response time and conducting regular brake tests and performance assessments to ensure safety standards are met, ultimately creating a sustainable braking system for safer and more reliable transportation.

Session III: Smart & Sustainable Automotive Parts Manufacturing Systems



Resource person: Mr. Silambarasan, Deputy Manager Design, Wheels India Ltd, Chennai.

Mr. Silambarasan shared insights into smart and sustainable manufacturing systems for automotive parts, providing a glimpse into design considerations. He emphasized the significance of sustainable practices, including the use of eco-friendly materials, energy-efficient

technologies, and waste reduction, to minimize the environmental impact of production processes. Key components of the suggested system include IoT for real-time monitoring, robotics and automation for enhanced efficiency, data analytics for process optimization, 3D printing for on-demand production, and the incorporation of eco-friendly materials. The touted benefits encompass cost reduction, improved product quality, reduced environmental impact, increased flexibility, and predictive maintenance. Silambarasan concludes that embracing smart and sustainable manufacturing practices is crucial for companies in the automotive industry, not only contributing to environmental sustainability but also positioning them as leaders in innovation and efficiency to meet the evolving market demands.

Session IV: Application of MATLAB in Mechatronics



Resource person: Mr. Gowtham Rajmohan, Sr. Application Engineer-MATLAB, ARK Infosolutions Pvt Ltd, Chennai.

Mr. Gowtham Rajmohan delved into the practical applications of MATLAB in the field of mechatronics, showcasing its role in system simulation and analysis. He emphasizes MATLAB's crucial role in advancing mechatronics research, serving as a powerful tool for modelling, simulation, and analysis. MATLAB facilitates dynamic modelling of mechatronic systems, enabling the representation of mechanical, electrical, and control components through detailed Simulink block diagrams. It supports simulation and analysis, allowing researchers to evaluate system behaviour, performance, and stability under various conditions. MATLAB's robust control system design tools aid in implementing and comparing classical and advanced control techniques for optimizing system performance. In signal and image processing, MATLAB's toolboxes filter and analyse sensor data, enhancing control algorithms and system reliability in mechatronics.

Session V: Application of MATLAB in Automotive Systems



Resource person: Dr. Vivek Ashokan, Regional Manager-MATLAB, ARK Infosolutions Pvt Ltd, Chennai.

Dr. Vivek Ashokan expanded on the application of MATLAB specifically in automotive systems, exploring its contributions to innovation and efficiency. He delves into the specialized application of MATLAB in the realm of automotive systems, shedding light on its profound contributions to innovation and efficiency. In the automotive sector, MATLAB serves as a linchpin for engineers and researchers, offering a versatile platform for intricate tasks such as modeling, simulation, and analysis. Its robust capabilities empower professionals to create dynamic models that accurately represent the complexities of automotive systems, including mechanical, electrical, and control components. MATLAB's Simulink toolbox proves invaluable in the development of comprehensive block diagrams, providing a holistic understanding of system interactions critical for refining automotive designs. Through sophisticated simulations and analyses facilitated by MATLAB, researchers can fine-tune various aspects of automotive systems, from control strategies to sensor placements, enhancing overall performance before the physical implementation stage. Dr. Ashokan underscores how MATLAB's specialized functionalities propel the automotive industry forward, fostering a culture of innovation and efficiency.

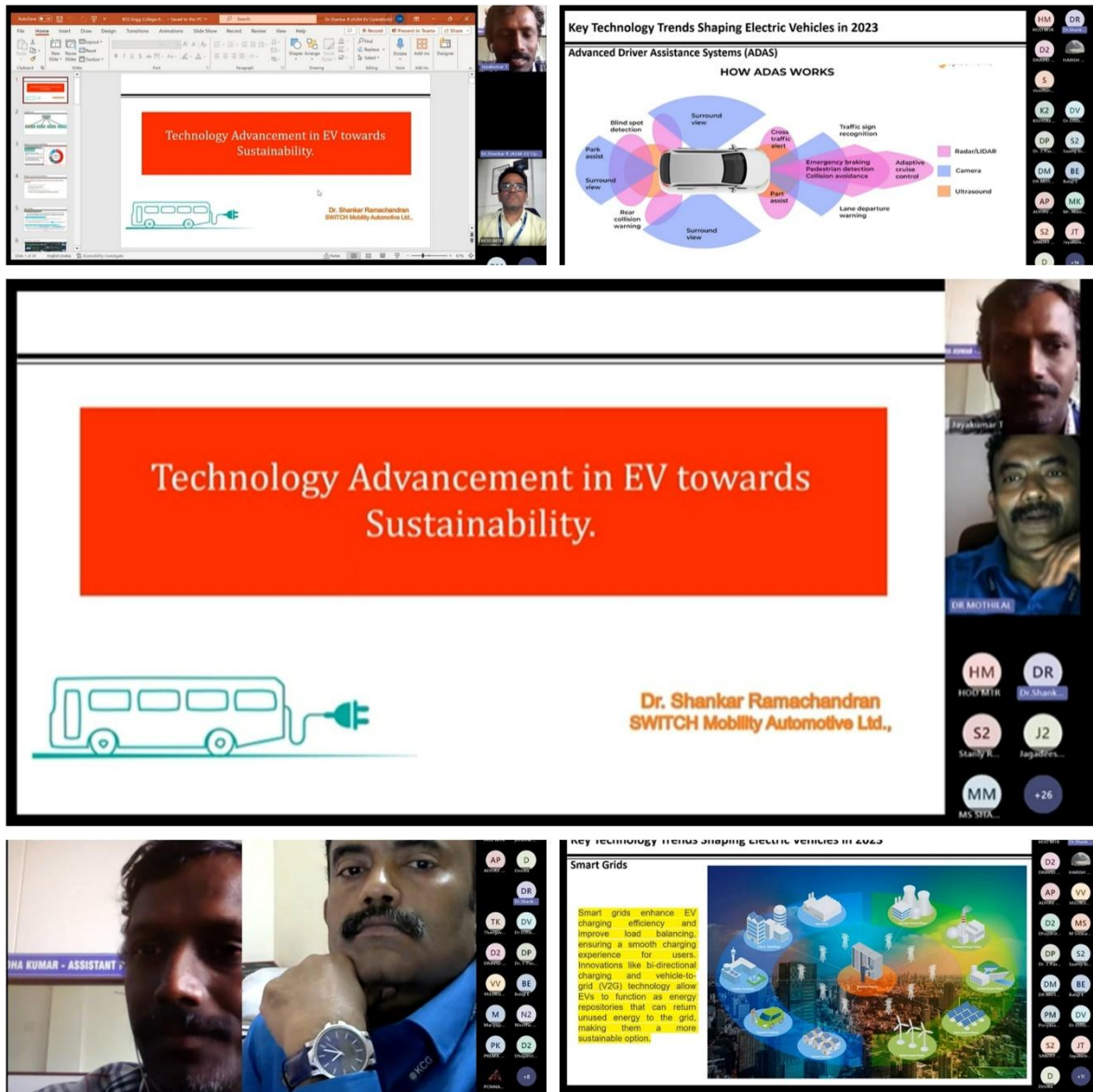
Session VI: Sustainability in Automobile Industry



Resource person: Mr. Shravan Kumar, Program Planning & Production Control, BMW Group, Chennai.

Mr. Shravan Kumar discussed sustainability practices within the automobile industry, highlighting initiatives and strategies adopted by BMW Group. He sheds light on the exemplary initiatives and strategies implemented by BMW Group. Kumar underscores BMW's commitment to environmental responsibility by detailing the company's comprehensive sustainability programs. From adopting eco-friendly manufacturing processes to incorporating recycled materials in vehicle production, BMW practices a holistic approach to minimizing its ecological footprint. Kumar emphasized the incorporation of innovative technologies, such as electric mobility solutions and energy-efficient manufacturing practices, as integral components of BMW's sustainable initiatives. Furthermore, he discusses BMW's engagement in community-oriented sustainability projects, reflecting a commitment to social responsibility beyond the manufacturing realm. By elucidating BMW Group's sustainability endeavors, Mr. Shravan Kumar highlights the automotive industry's evolution towards a more environmentally conscious and socially responsible future.

Session VII: Technology Advancement in EV Towards Sustainability



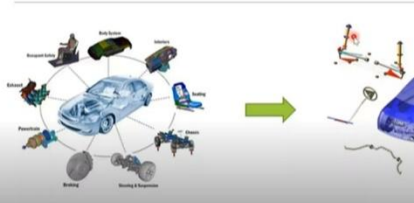
Resource person: Dr. Shankar Ramachandran, AGM-EV Operations, Switch Mobility Automotive India, Ashok Leyland Group, Tamil Nadu.

Dr. Shankar Ramachandran provided insights into the technological advancements in electric vehicles (EVs) with a focus on sustainability. In his enlightening presentation, he delved into the cutting-edge technological advancements within the electric vehicle (EV) sector, placing a pivotal focus on sustainability. Dr. Ramachandran discussed the transformative landscape of EVs, emphasizing their role as a key driver in addressing environmental concerns and reducing the carbon footprint associated with traditional combustion engines. He provided a comprehensive overview of the latest breakthroughs in EV technology, including advancements in battery efficiency, range optimization, and regenerative braking systems. Dr. Ramachandran underscored the importance of sustainability by examining the integration of eco-friendly materials in manufacturing processes and the development of energy-efficient propulsion systems. His insights not only showcased the strides made in enhancing the performance and viability of EVs but also underscored the industry's commitment to fostering sustainability,

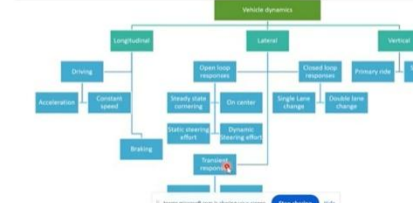
contributing significantly to the paradigm shift towards cleaner and greener transportation solutions.

Session VIII: Vehicle Handling Attributes for Sustainability


MBD



Classification of vehicle dynamics

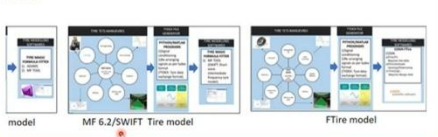


VEHICLE HANDLING ATTRIBUTES FOR SUSTAINABILITY

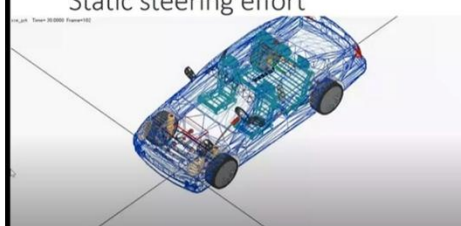


Tire development

loops are carried out in Tire – Vehicle tuning so as to select the best tire suitable for the driver these tuning cycles take a lot of time. Hence Tire – Vehicle Simulations are of utmost importance & cost perspective. as Ftire & PAC2002 play a vital role in Ride & Handling simulations while FEA simulations are used for NVH.



Static steering effort



Resource person: Mr. Jeffin Job, Technical Lead- Vehicle Dynamics, Tata Technologies, Maharashtra.

Mr. Jeffin Job discussed the importance of vehicle handling attributes in achieving sustainability goals, emphasizing the role of effective vehicle dynamics. He delved into the critical intersection of vehicle handling attributes and sustainability goals within the automotive industry. Job emphasized that achieving sustainability goes beyond environmental considerations and encompasses the overall efficiency and performance of vehicles. He highlighted the pivotal role of effective vehicle dynamics in this context, emphasizing how optimal handling attributes contribute to energy efficiency, reduced emissions, and enhanced safety. By elucidating the correlation between vehicle dynamics and sustainability, Job underscored the need for a holistic approach in designing and manufacturing vehicles that align with eco-friendly objectives. His insights shed light on the industry's pursuit of not only reducing the environmental impact but also improving overall vehicle performance, creating a symbiotic relationship between sustainability goals and efficient vehicle handling. Through Job's discussion, the audience gained a nuanced understanding of how advancements in vehicle dynamics play a vital role in the broader landscape of sustainable transportation.

Session IX: Charging Ahead: Electric Vehicles and Sustainable Mobility Ecosystem

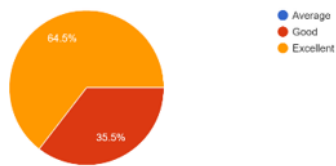


Resource person: Dr. B. Balaji, Professor of Practice, IIT Madras, Tamil Nadu.

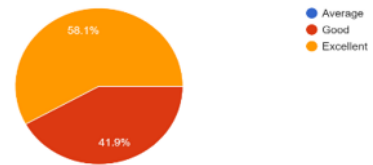
Dr. B. Balaji concluded the program by discussing the role of electric vehicles in the sustainable mobility ecosystem, emphasizing the need for advancements in charging infrastructure. He provided a comprehensive overview of the pivotal role that electric vehicles (EVs) play in the sustainable mobility ecosystem. Dr. Balaji underscored the significance of EVs as a key component in mitigating environmental impact and promoting a greener transportation paradigm. He highlighted the need for continual advancements in charging infrastructure as a critical factor in the widespread adoption and success of EVs. Emphasizing the symbiotic relationship between the expansion of electric vehicle fleets and the development of efficient charging networks, Dr. Balaji articulated the importance of creating a seamless and accessible infrastructure to bolster the growth of sustainable mobility. Through his insightful discussion, Dr. Balaji not only emphasized the environmental benefits of EVs but also underscored the imperative of concurrently advancing the supporting charging infrastructure to ensure the long-term viability and success of electric vehicles in the broader context of sustainable transportation.

The virtual culmination of the five-day Faculty Development Program (FDP) featured a heartfelt vote of thanks delivered by Mr. S. Mathavan, Assistant Professor in the Department of Automobile Engineering and one of the FDP coordinators. Expressing sincere appreciation, recognition was extended to our esteemed management, Principal Dr. M. Muthukannan, and Dean of Academics Dr. G. Prabhakaran. Special acknowledgment was given to the FDP convenors, Dr. S. Kaliappan (HoD-Mechatronics Engineering) and Dr. T. Mothilal (HoD-Automobile Engineering), as well as the coordinator Mr. K.K. Manivannan (AP-Mechatronics Engineering). Heartfelt thanks were also extended to the entire teaching and non-teaching faculty members, as well as the resource persons whose invaluable contributions significantly contributed to the success of the program.

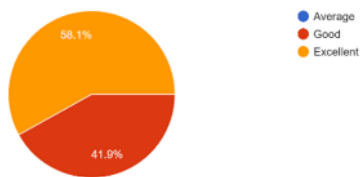
How would you rate the Session Experts: Dr. Suresh Kumar G (SESSION I-Integrating Automotive Systems for CASE)
31 responses



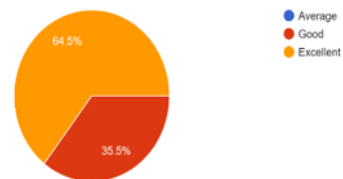
Mr. S. Mithun (SESSION II- Exploring Sustainable Innovations in Automotive Braking Systems: A green Approach to Transportation safety)
31 responses



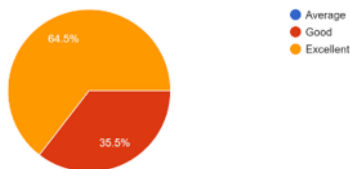
Mr.Silambarasan (SESSION III- Smart & Sustainable Automotive parts Manufacturing Systems)
31 responses



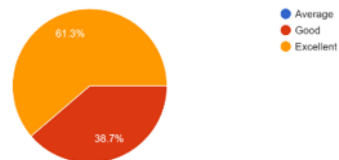
Mr. Gowtham Rajmohan (SESSION IV- Application of MATLAB in Mechatronics)
31 responses



Dr. Vivek Ashokan (SESSION V- Application of MATLAB in Automotive systems)
31 responses

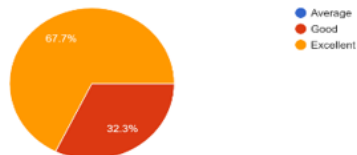


Mr. Shravan Kumar (SESSION VI- Sustainability in Automobile Industry)
31 responses



FEEDBACK FROM THE PARTICIPANTS:

Dr.Shankar Ramachandran (SESSION VII- Technology advancement in EV towards sustainability)
31 responses

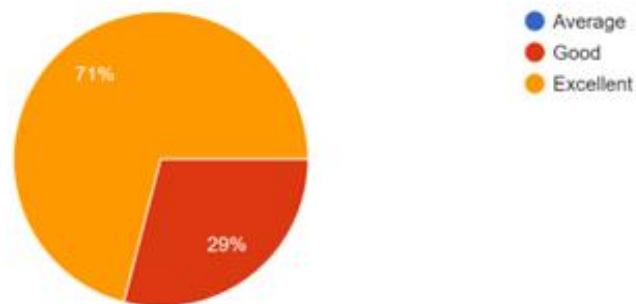


Mr.Jeffin Job (SESSION VIII-Vehicle handling attributes for Sustainability)
31 responses

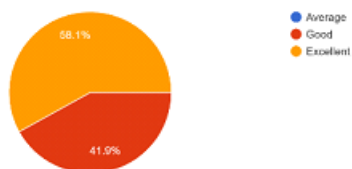


Prof.B.Balaji (SESSION IX- Charging ahead: Electric Vehicles and Sustainable mobility Ecosystem

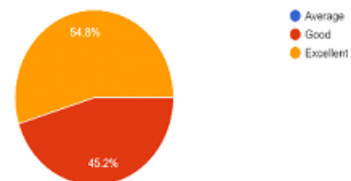
31 responses



Based on the following parameters, please rate the session: The content of FDP was informative and beneficial
31 responses

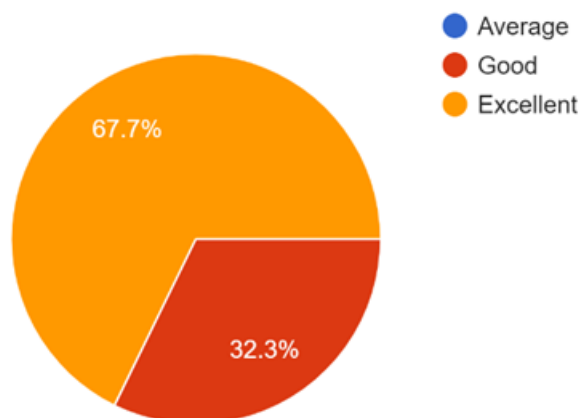


Information shared met with an expectation
31 responses



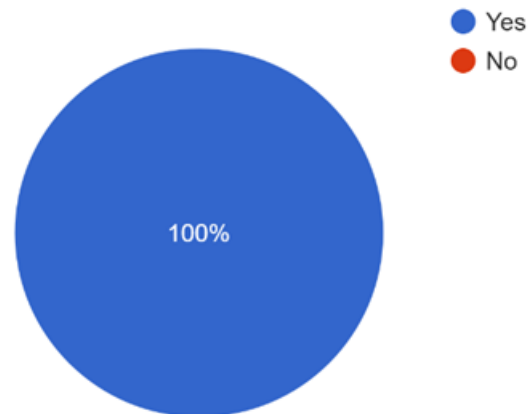
Overall Feedback of the FDP

31 responses



Would you Like to attend our FDP/Workshop in future?

30 responses



The Faculty Development Programme provided a comprehensive overview of the integration of automotives and smart mechatronics systems for sustainable mobility. The diverse range of topics covered by experienced industry professionals contributed to the enrichment of knowledge among the faculty members, fostering a deeper understanding of the latest trends and innovations in the automotive sector. The hybrid mode of the program allowed for broader participation and engagement.
