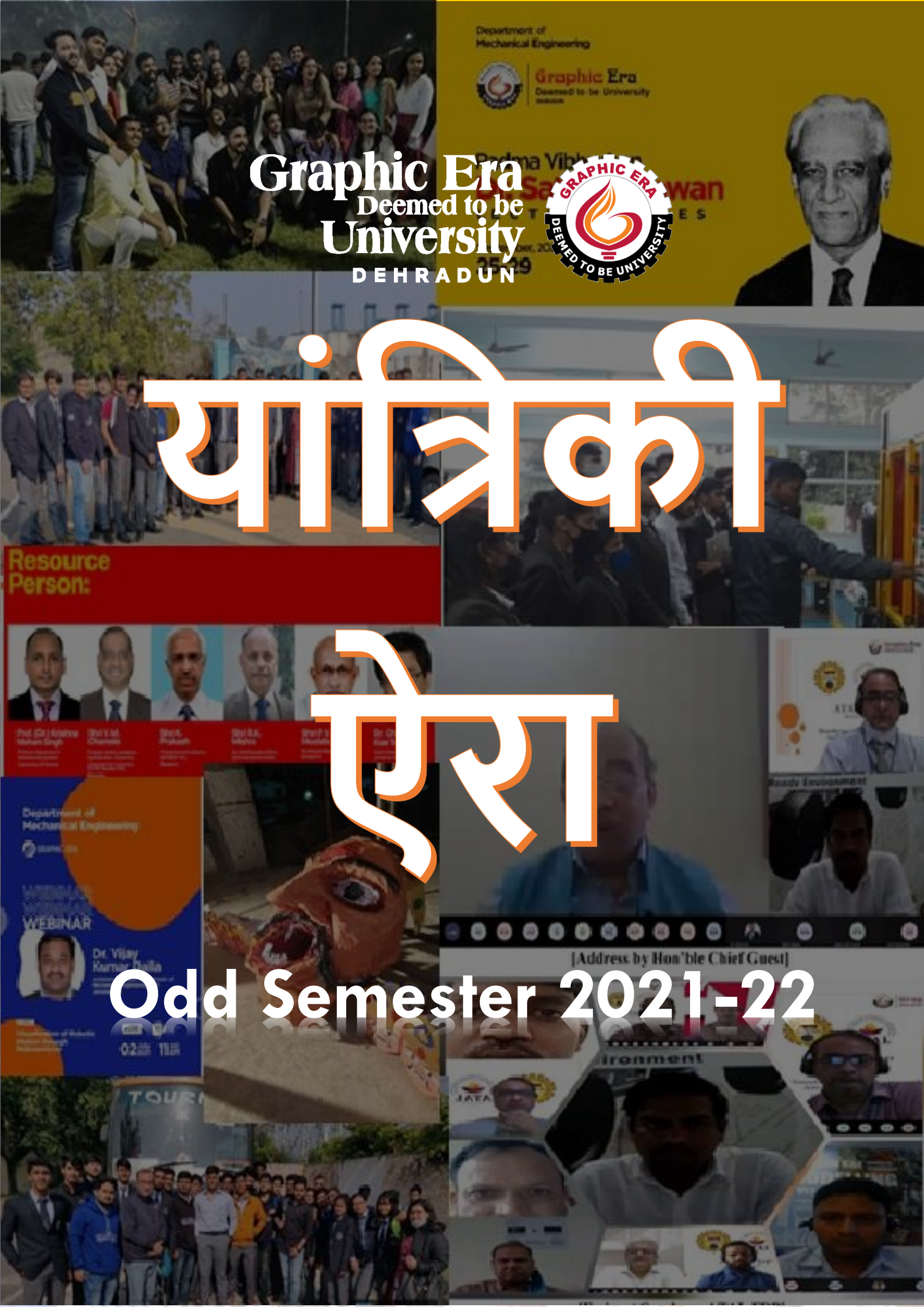


यांत्रिकी ऐरा

Odd Semester 2021-22

Institute:

Vision:

We visualize Graphic Era (Deemed to be University) as an internationally recognized, enquiry driven, ethically engaged diverse community, whose members work collaboratively for positive transformation in the world, through leadership in teaching, research and action.

Mission:

The mission of the university is to promote learning in true spirit and offer knowledge and skills in order to succeed as professionals. The university aims to distinguish itself as a diverse, socially responsible learning community with high-quality scholarship and academic rigour.

Department:

Vision:

The vision of the department is to be regionally, nationally and internationally recognized in providing Mechanical Engineering education, leading to well qualified Engineers who are Creative, Ethical Environmentally friendly, Self-esteemed and successful in Research.

Mission:

The mission of the department is to educate, prepare, inspire, and mentor students to excel as professionals at both the undergraduate and post graduate levels for leadership roles in the fields of mechanical engineering and to conduct research for the benefit of society.

M1- To imparting quality education to the students and enhancing their skills to make them globally competitive engineers.

M2- To maintaining vital, state-of-the-art research facilities to improve its students and faculty with opportunities to create, interpret, apply and disseminate knowledge.

M3- To develop linkages with world class R&D organization and educational institutions in India and abroad for excellence in teaching, research and consultancy practices.

M4- To produce ethical, motivated and competent engineers capable of solving current problems and envisaging and developing new technologies beneficial to society.

1.2 State the Program Educational Objectives (PEOs) (5)

The Program Educational Objectives (PEOs) for Mechanical Engineering students typically center around the broad goals that the program seeks to achieve for its graduates. There are four commonly stated objectives:

PEO1: To enable students to apply core principles and emerging technologies in Mechanical Engineering to address modern industry and societal challenges.

PEO2: To equip students with a strong foundation in core principles and emerging technologies, enabling them to solve complex engineering problems and pursue advanced studies, research, and innovation in Mechanical Engineering.

PEO3: To foster communication, ethics, and leadership in students, enabling them to excel in emerging Mechanical Engineering trends and contribute to industry, society, and science globally.

PEO4: To foster lifelong learning, innovation-driven entrepreneurship, and research in emerging technologies, with a focus on ethics and environmental sustainability for societal benefit.

Dussehra Celebration at Graphic Era Deemed to be University

Date: 15th October 2021

Graphic Era Deemed to be University (GEU) witnessed a grand and eco-friendly celebration of Dussehra on 15th October 2021, organized by the enthusiastic members of the Papertech Club, Department of Mechanical Engineering. This festive occasion was marked by an innovative and sustainable initiative – the creation of a 25-foot-tall Ravan effigy made entirely out of wastepaper. The celebration not only brought the vibrant spirit of Dussehra to the campus but also underscored the importance of sustainability, creativity, and teamwork in all endeavours. The initiative was a remarkable demonstration of how art and engineering can merge to promote environmental consciousness while keeping cultural traditions alive.

An Iconic Effigy with a Sustainable Twist

The highlight of the celebration was undoubtedly the 25-foot-tall effigy of Ravan, which was meticulously crafted by the members of the Papertech Club using waste paper collected from the university campus. This eco-friendly approach reflected the commitment of GEU's students toward a sustainable future, where traditional celebrations can be made environmentally responsible.

The process of building the effigy spanned several days and required meticulous planning and coordination. The students worked in teams to collect waste paper, design the structure, and assemble the various components. By utilizing recyclable materials, the students gave a creative twist to the celebration, setting an example of sustainability for everyone on campus.

Fostering Creativity and Teamwork

This initiative by the Papertech Club provided students with an invaluable opportunity to showcase their creative abilities and enhance their problem-solving skills. The process of designing and constructing the effigy required innovation, structural planning, and efficient teamwork. From brainstorming ideas to executing the design, every step of the project reflected the students' dedication and ingenuity.

Moreover, the collaboration among the students fostered a strong sense of camaraderie, as they worked tirelessly to bring their vision to life. The experience served as a practical demonstration of how teamwork and creativity can lead to exceptional results while aligning with the principles of sustainability.

A Grand Celebration

The Dussehra celebration was attended by faculty members, staff, and students from across the university, who gathered to witness

the symbolic burning of the Ravan effigy. The event beautifully combined the festive spirit with a message of eco-consciousness, as the effigy, made from biodegradable materials, was burned in an environmentally responsible manner.
The event was accompanied by cultural performances and speeches that emphasized the significance of Dussehra and the need for adopting sustainable practices in all aspects of life. The students' efforts were widely appreciated, and the event was a huge success in spreading awareness about the importance of waste management and eco-friendly initiatives.

A Step Towards a Sustainable Future

The Dussehra Celebration 2021 at GEU exemplified how tradition and sustainability can coexist harmoniously. The efforts of the Papertech Club were commendable in not only preserving the cultural essence of the festival but also promoting environmental awareness among the university community. Graphic Era Deemed to be University remains committed to empowering its students to become creative, responsible, and eco-conscious individuals. Events like these reaffirm the university's mission to shape a brighter, greener future. Kudos to the Papertech Club and the Department of Mechanical Engineering for their innovative contribution to this meaningful celebration!

Industrial Visit at "Chilla Hydro Power Plant"

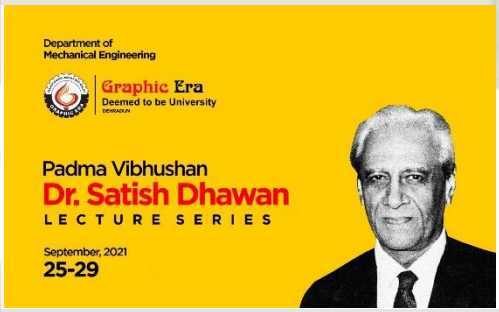
An industrial visit was organized at "Chilla Hydroelectric Power Plant" Haridwar, on 26/11/21 comprising of around 30 undergraduate students of B.Tech 2nd year Mechanical Engg. accompanied with faculty members - Dr. Nitin Johri(ME), Ms. Jyoti Joshi(ME) and Mr. Pradeep Raturi (Admn.).

Chilla Hydroelectric Power Plant is a Run-of-River scheme on river Ganga located upstream. Plant had a Capacity of 144 MW by means of 4 Kaplan turbines with a water head of 32.5 m. Design Discharge is 560 m^3/s and Gen and transmission voltage are 11 KV/132 KV. The turbine type was Kaplan with an average speed of 187.5 RPM. The power units generated is 7200 Lac Unit per year.

Outcome of the visit involved technical knowhow of Hydro Power Generation Equipment. Students have submitted a visit report highlighting the learned concepts during educational visit.

Padma Vibhushan Dr. Satish Dhawan Lecture Series (25th - 29th September 2021)

The Department of Mechanical Engineering at Graphic Era Deemed to be University (GEU) successfully hosted a five-day lecture series titled "Padma Vibhushan Dr. Satish Dhawan Lecture Series" from 25th September 2021 to 29th September 2021. The event, held in online mode, paid tribute to Dr. Satish Dhawan, one of India's most esteemed scientists and a pioneer in aerospace engineering. The lecture series provided an excellent opportunity for students, faculty members, and research scholars to gain valuable insights from some of the most distinguished experts in aerospace, mechanical engineering, and industrial research.



Esteemed Speakers and Their Contributions

The lecture series featured an impressive lineup of eminent resource persons who are pioneers in their respective fields. These distinguished speakers shared their knowledge, experiences, and research, offering the attendees an in-depth understanding of various aspects of mechanical and aerospace engineering.

Prof. (Dr.) Krishna Mohan Singh
(Professor, Department of Mechanical & Industrial Engineering, IIT Roorkee)
Delivered a thought-provoking session on advanced manufacturing techniques and their significance in the aerospace and automotive industries.
Highlighted the role of Industry 4.0, smart manufacturing, and automation in shaping the future of engineering.

Shri V. M. Chamola
(Program Adviser, Aerospace Specialization, GEU & Ex-HR Director, Bangalore)
Spoke about human resource development in the aerospace industry and the need for future-ready engineers equipped with technical, analytical, and leadership skills.
Stressed the importance of interdisciplinary knowledge and global exposure for young professionals.

Shri K. Prakash
(Former Executive Director, MCSRDC HAL, Bangalore)
Discussed innovations in avionics and aerospace design while emphasizing the challenges faced in the Indian aerospace sector.
Highlighted the role of Hindustan Aeronautics Limited (HAL) in advancing aerospace technologies in India.

Shri R.K. Mishra
(Ex-Chief Executive Officer, Naini Aerospace Limited, Prayagraj)
Delivered an engaging session on aircraft manufacturing and maintenance.
Explained the evolution of aircraft technology and its implications for the defense and commercial sectors.

Shri P. V. Mustafa
(Ex-General Manager, HAL, Bangalore)
Focused on the importance of sustainable aviation and green technology in aerospace engineering.
Provided valuable insights into the design and development of indigenous aircraft.

Dr. Chee Kiat Teo
(Senior Research Scientist, Center for Climate Research, Singapore)
Brought an international perspective by discussing the impact of climate change on aerospace technology.

Addressed the need for sustainable aviation fuels (SAF) and eco-friendly propulsion systems to reduce carbon footprints in the aviation industry.

Key Takeaways from the Lecture Series

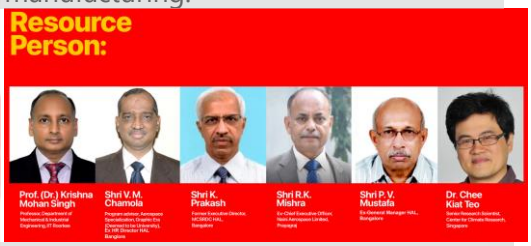
The lecture series provided an interdisciplinary approach by combining mechanical, aerospace, and industrial perspectives.

Students gained a deeper understanding of emerging trends in manufacturing, aerospace, and sustainable engineering.

The sessions helped bridge the gap between academic learning and real-world industrial applications.

The importance of innovation, research, and sustainability in aerospace engineering was emphasized.

The discussions inspired young engineers to pursue careers in cutting-edge technological domains such as aerospace, avionics, and advanced manufacturing.



Impact and Conclusion

The Padma Vibhushan Dr. Satish Dhawan Lecture Series was a resounding success, with enthusiastic participation from students, faculty, and researchers. The insights shared by the expert speakers enhanced the technical knowledge and industry awareness of the attendees, preparing them for future challenges in their engineering careers.

The Department of Mechanical Engineering at Graphic Era Deemed to be University remains committed to fostering a culture of excellence, innovation, and research. By organizing such intellectually enriching events, the university continues to inspire and empower the next generation of engineers to make meaningful contributions to science and technology.

The event concluded with a vote of thanks to all the distinguished speakers, attendees, and organizers, with a promise to continue such initiatives in the future.

Familiarization of Industry 4.0 Concepts

The Department of Mechanical Engineering at Graphic Era Deemed to be University (GEU) successfully organized a one-day workshop on "Familiarization of Industry 4.0 Concepts" on 25th November 2021 for polytechnic students. This workshop aimed to provide young engineering students with valuable insights into the latest advancements in smart manufacturing, automation, and digital transformation in industries.

Understanding Industry 4.0

Industry 4.0, often referred to as the Fourth Industrial Revolution, represents a fusion of cyber-physical systems, IoT (Internet of Things), artificial intelligence (AI), big data analytics, and cloud computing. It is transforming manufacturing and industrial operations by enhancing automation, connectivity, and efficiency. The workshop aimed to bridge the gap between academic learning and industrial applications, enabling students to be future-ready for the evolving technological landscape.

Workshop Highlights

The session commenced with a keynote address by industry experts and faculty members, who emphasized the importance of Industry 4.0 in modern manufacturing.

The key highlights of the workshop included:

- Introduction to Industry 4.0 and its impact on various industries.
- Hands-on demonstration of IoT-enabled devices and their applications in smart manufacturing.
- Exploration of AI and machine learning in industrial automation.
- Case studies on successful implementation of Industry 4.0 in real-world scenarios.
- Interactive Q&A sessions where students engaged with experts to understand practical challenges.

Key Takeaways

- Enhanced awareness about smart technologies and their integration into industrial systems.
- Understanding the role of data analytics, cloud computing, and cybersecurity in modern industries.
- Realizing the significance of upskilling and adapting to new technologies for career growth.
- Exposure to practical applications of Industry 4.0 concepts in various engineering domains.

Conclusion

The workshop was highly interactive, informative, and engaging, with enthusiastic participation from polytechnic students. The event successfully bridged the gap between theory and real-world industrial practices, ensuring that students gained practical exposure to modern manufacturing techniques.

The Department of Mechanical Engineering at Graphic Era Deemed to be University continues to promote technological awareness and skill development through such workshops, preparing students for the next generation of industrial advancements.

Manufacturing Application of Automation & Robotics

The Department of Mechanical Engineering at Graphic Era Deemed to be University (GEU) successfully conducted an AICTE-sponsored Faculty Development Program (FDP) on "Manufacturing Application of Automation & Robotics" from 26th to 30th July 2021 under the ATAL (AICTE Training and Learning) Academy. This five-day FDP was aimed at enhancing the knowledge and skills of faculty members, research scholars, and industry professionals in the field of automation and robotics in manufacturing. The program focused on modern industrial practices, recent advancements, and emerging trends in manufacturing technologies.

Key Highlights of the FDP

The FDP featured expert lectures, interactive sessions, hands-on demonstrations, and case studies from renowned academicians, industry professionals, and researchers. Some of the key highlights included:

- Introduction to Automation & Robotics in Manufacturing – Understanding the role of automation in modern production systems.
- Advanced Robotics & Artificial Intelligence (AI) Applications – Exploring how AI is transforming industrial automation.
- Industry 4.0 and Smart Manufacturing – Insights into the

digital transformation of manufacturing.
- Hands-on Demonstrations & Virtual Lab Sessions – Practical exposure to robotic programming and automation systems.
- Challenges & Future Scope – Addressing the implementation challenges and discussing future trends in automation.

[Address by Hon'ble Chief Guest]


[Eminent Speakers- ATAL FDP]

Expert Speakers & Sessions

The FDP was graced by eminent speakers from leading academic institutions and industries, who shared their expertise and real-world experiences. The interactive discussions provided valuable insights into the integration of automation and robotics in various industrial applications.

Impact & Takeaways

- Enhanced understanding of automation and robotics in the manufacturing sector.
- Exposure to cutting-edge technologies like AI, IoT, and smart manufacturing.
- Development of teaching and research capabilities in automation and robotics.
- Networking opportunities with industry professionals and academicians.

Conclusion

The ATAL FDP on "Manufacturing Application of Automation & Robotics" was a resounding success, with active participation from faculty members, researchers, and industry professionals. The program provided an enriching learning experience and empowered educators with knowledge of the latest technological advancements in manufacturing.

The Department of Mechanical Engineering at Graphic Era Deemed to be University remains committed to promoting cutting-edge research, innovation, and skill development in the ever-evolving field of automation and robotics.

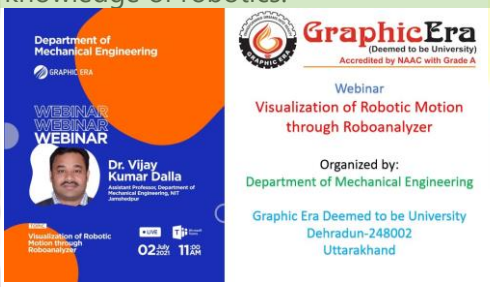
Visualization of Robotic Motion through Roboanalyzer

The Department of Mechanical Engineering at Graphic Era Deemed to be University (GEU) organized an insightful webinar on "Visualization of Robotic Motion through Roboanalyzer" on 2nd July 2021. The session was conducted by Dr. Vijay Kumar Dalla, Assistant Professor, Department of Mechanical Engineering, NIT Jamshedpur, who shared his expertise on robotic motion analysis and simulation using the Roboanalyzer software.

Overview of the Webinar

The webinar aimed to introduce participants to robotic motion visualization using Roboanalyzer, a 3D model-based robotics simulation software. It provided an interactive learning experience on robot kinematics, dynamics, and control

mechanisms through real-time simulation tools. The session attracted a diverse audience, including faculty members, research scholars, and students eager to expand their knowledge of robotics.



Key Takeaways from the Session

Dr. Vijay Kumar Dalla conducted an engaging session covering various topics, including:

- Introduction to Roboanalyzer Software – Understanding the basics of robotic simulation and its applications.
- Forward and Inverse Kinematics – Analyzing robotic motion and joint movements through simulations.
- 3D Visualization of Robotic Arms – Demonstrating how different robotic arms function in industrial applications.
- Practical Demonstration of Roboanalyzer Features – Showcasing real-time simulations of robotic mechanisms.
- Scope of Robotics in Industry 4.0 – Discussing the growing relevance of automation and robotics in smart manufacturing.

Interactive Session & Hands-on Learning

Participants actively engaged with the speaker through a Q&A session, where they inquired about robotic control systems, simulation accuracy, and real-world applications of Roboanalyzer. Dr. Dalla provided practical demonstrations to help attendees gain a better understanding of robotics modeling and motion analysis.

Impact & Benefits

- Enhanced knowledge of robotic motion simulation using Roboanalyzer software.
- Exposure to real-world applications of robotics in manufacturing, automation, and AI-driven technologies.
- Skill development in robotics visualization, beneficial for students pursuing careers in automation and robotics engineering.

Conclusion

The webinar on "Visualization of Robotic Motion through Roboanalyzer" was highly informative and interactive, offering participants valuable insights into robotics simulation. The Department of Mechanical Engineering at Graphic Era Deemed to be University remains committed to fostering innovative learning experiences and equipping students with advanced technical knowledge in emerging fields like robotics and automation.

Infrastructure and Facilities

- **State-of-the-art labs:** Well-equipped labs for robotics, mechatronics, CAD/CAM, and computational fluid dynamics.
- **Advanced manufacturing facilities:** 3D printing, CNC machining, and laser cutting facilities.
- **Mechanical workshop:** Fully equipped workshop for hands-on training and project development.
- **Research centers:** Established research centers for renewable energy, robotics, and advanced manufacturing.

- **Industry collaborations:** Partnerships with leading industries for joint research projects and internships.
- **Innovation incubator:** Dedicated space for students to develop and incubate their innovative ideas in any of our lab simulation labs can also be included.
- Advanced ML-AI based innovations, projects and skill development courses.
- Active clubs for robotics, racing, and innovation, annual technical festivals with competitions, workshops, and guest lectures, Regular industrial visits and tours to provide hands-on experience.

Opportunities After Engineering

Core Mechanical Fields

Opportunities in automotive, aerospace, thermal power, HVAC, and robotics, focusing on design, manufacturing, and quality control.

Interdisciplinary Fields

Scope in biomedical engineering, data analytics, and mechatronics, merging mechanical expertise with emerging domains.

Manufacturing & Production

Roles in production engineering, tool & die making, and quality assurance to optimize manufacturing processes.

Government Sector

Opportunities in PSUs (BHEL, NTPC, IOCL), Indian Railways, DRDO, and ISRO in design, maintenance, and R&D.

Research & Development (R&D)

Innovation in materials, manufacturing, thermal, and industrial design, with opportunities in government and private R&D labs.

Higher Education & Certifications

Advanced studies (M.Tech, PhD, MBA) and skill enhancement through ANSYS, CATIA, Six Sigma, PMP certifications.

Emerging Technologies

Careers in 3D printing, renewable energy, IoT, and smart systems for industrial advancements.

Global Opportunities

High demand for mechanical engineers in Germany, Canada, USA, Japan, and Australia.

Entrepreneurship

Starting ventures in manufacturing, robotics, renewable energy, and consultancy.

Founded by Prof. Kamal Ghanshala in 1997, Graphic Era (Deemed to be University) has grown immensely. As the Best University in Dehradun, we offer a high-quality education and a nurturing environment that encourages innovation, fosters critical thinking, and prepares you for the future. To offer a world-class education that focuses on cutting-edge technology, student professional development, critical thinking, and high-quality research. Graphic Era (Deemed to be University), India's premier university, has accomplished countless milestones in its illustrious history thanks to its academic rigor, continuously top-performing students and alumni, and a very strong and competent teaching faculty.

It has been proven beyond reasonable doubt that Graphic Era is among the top-notch universities in India as our University has featured in the Top 100 Universities of India, in the coveted National Institutional Ranking Framework established by the Government of India, for the past five years consecutively, with the rankings growing each year across varied domains.

Graphic Era (Deemed to be University) is located in the lovely and quiet city of Dehradun, tucked in a valley bounded by Rajaji National Park on one side and Clement Town Cantonment on the other. Graphic Era (Deemed to be University), the premier University in Uttakharand, prioritises overall student development.

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