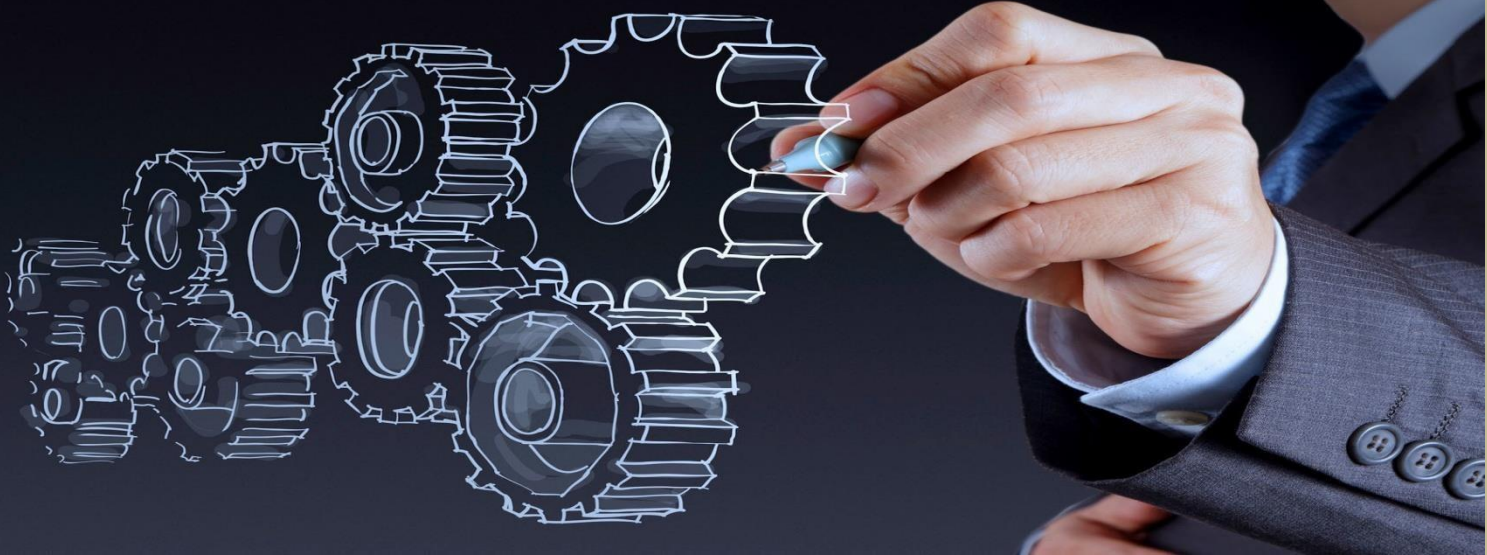


DEPARTMENT OF MECHANICAL ENGINEERING



"YANTRIK"

THE DEPARTMENTAL NEWSLETTER 2024



GAIKWAD-PATIL
GROUP OF INSTITUTIONS
Vision beyond the limits...

Vision Mission of the Institute



Vision

“To emerge as a learning Center of Excellence in the National Ethos in domains of Science, Technology and Management”



Mission

- *To strive for rearing standard and stature of the students by practicing high Standards of professional ethics, transparency and accountability.*
- *To provide facilities and services to meet the challenges of Industry and Society.*
- *To facilitate socially responsive research, innovation and entrepreneurship.*
- *To ascertain holistic development of the students and staff members by inculcating knowledge and profession as work practices*



Vision Mission of the Department

Vision

“To Emerge as a Premier Centre in the Field of Mechanical Engineering Education and Produce Competent Engineers”



Mission

- *To Impart Quality Technical Education Through Effective Teaching-Learning Process.*
- *To Provide a Better Environment to Encourage Innovation and Entrepreneurship.*
- *To Strengthen Industry Institute Interaction to Meet the Challenges of Industry and Society Environment.*
- *To Ensure Overall Development of Students and Staff Members by Inculcating Knowledge and Professional Ethics.*

Programme Educational Objectives (PEOs)

Graduates will be able to

PEO1: Demonstrate essential technical skills to identify, analyze and solve problems and design issues in mechanical engineering.

PEO2: Analyze the complex problems in the field of mechanical engineering by using modern tools.

PEO3: Apply mechanical engineering concepts for the betterment of society and environment.

PEO4: Develop professionals having administrative and managerial skills for mechanical engineering and allied industries.

PEO5: Demonstrate the attributes of mechanical engineering in lifelong learning to contribute towards societal needs.

Programme Outcomes (POs)

Engineering Graduates will be able to:

1.**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2.**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3.**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4.**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5.**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6.**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7.**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8.**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9.**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10.**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11.**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12.**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



List of Faculty Members



DR. VIJAY TALODHIKAR
Head, Mechanical Engineering Department
B.E., M.Tech., Ph.D.
hod.mechanical@tgpcet.com



Dr. Deepak Gupta
Professor



Dr. Dheeraj Deshmukh
Professor



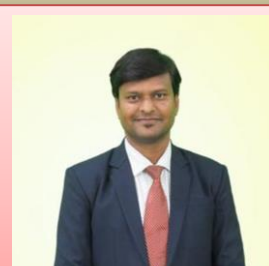
Dr. Yogesh Mahulkar
Associate Professor



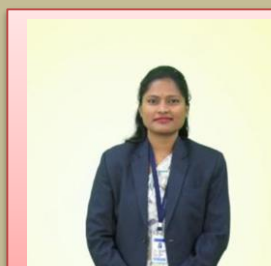
Dr. Vinay Kumar
Assistant Professor



Dr. Niteen Kakade
Assistant Professor



Mr. Vishwajeet Ambade
Assistant Professor



Mr. Dipali Bhoyar
Assistant Professor



Mr. Ritesh Banpurkar
Assistant Professor



Mr. Gaurav Nagdeve
Assistant Professor



Mr. Vivek Patil
Assistant Professor



Mr. Praful Randive
Assistant Professor



Mr. Ravindra Shende
Assistant Professor

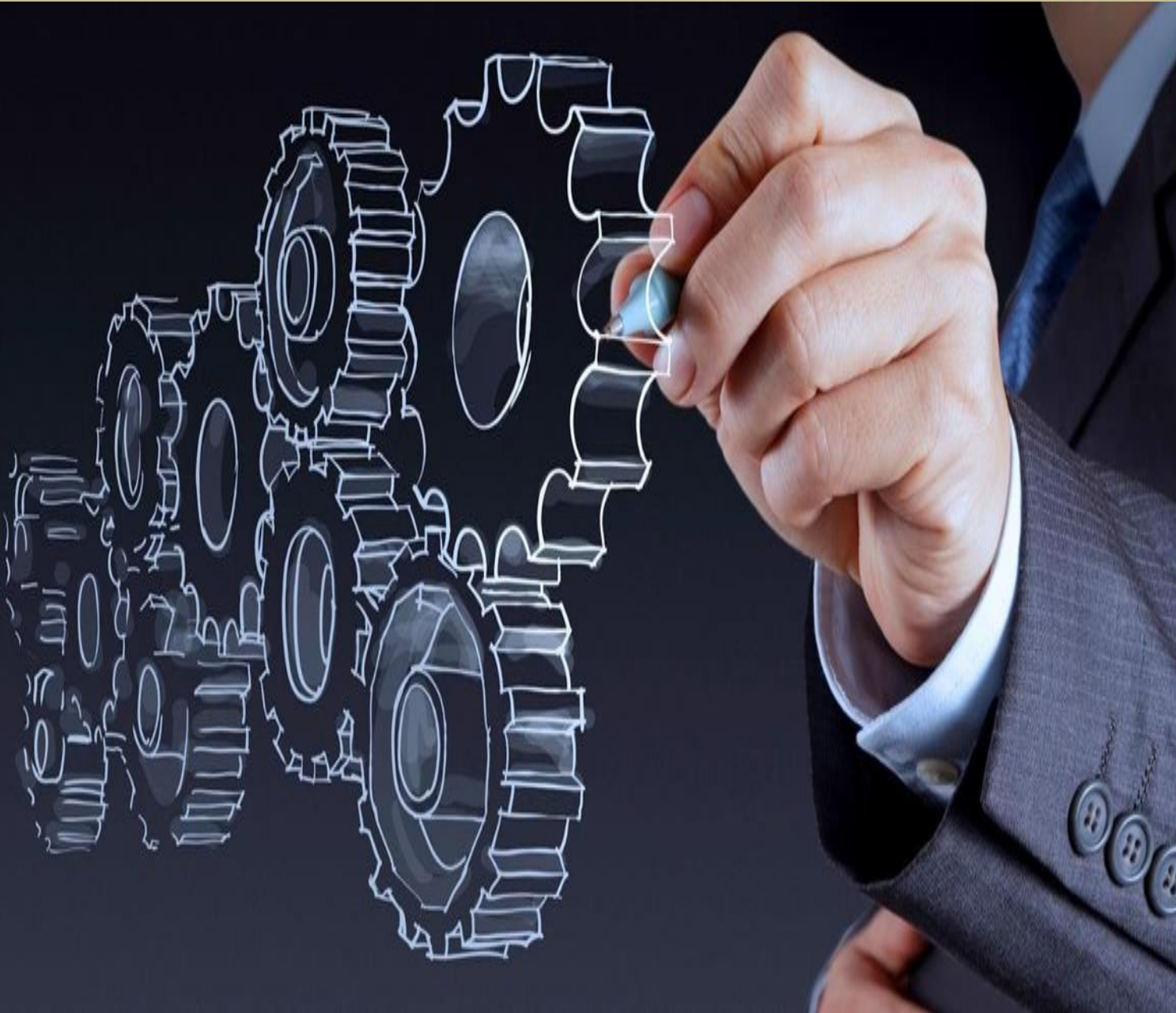




Mr. Anuj Muley
Assistant Professor



Mr. Pramer Bakane
Assistant Professor



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NAAC Accredited

Vidarbha Bahu-uddeshiya Shikshan Sanstha's

TULSIRAMJI GAIKWAD-PATIL
College of Engineering & Technology

— An Autonomous Institute —

DTE
CODE
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Massages



DR. MOHAN GAIKWAD-PATIL
Chairman, Gaikwad-Patil Group

With more than twenty years of experience in education system to his credit, established the Gaikwad- Patil Group of Institutions in Nagpur to cater to the quality education needs of the youth in Vidarbha. His early experience of teaching in an engineering college made him acutely aware of the dissonance between engineering education in the country and the requirements of the industry. He therefore began with a dream of starting an engineering college that equips students with knowledge, skills and attitudes relevant to the industry. That dream has manifested today in the form of two engineering colleges, well known in the region for their constant striving to impart quality and industry-relevant education to their students. Hardly in his early forties, Dr. Gaikwad is the young and dynamic face of the Group. His contagious enthusiasm and unflagging drive is truly inspiring.



DR. P. L. NAKTODE
Principal

It gives me immense pleasure and pride in welcoming you to Tulsiramji Gaikwad-Patil College of Engineering & Technology, one of the rapidly growing institutions in Vidarbha, dedicated to fostering technical education in the region. The vision of our institution is to empower youths and to produce technically skilled manpower with very high moral values that are not only employable but are also capable of creating employment for masses. Our mission is to provide outcome-based education by providing all necessary inputs, facilities and environment to empower our students in all possible ways. We understand that co-curricular and extra-curricular activities help in enhancing ones personality. This institution provides an environment for nurturing these activities so that young men and women get an opportunity to upgrade their skills and show cases their talent. To strengthen the wings of our students we have dynamic and dedicated workforce. Tulsiramji Gaikwad-Patil College of Engineering & Technology is committed to employing, developing and retaining the best teachers.



Prof. Pragati Patil
Vice Principal

Albert Einstein said, "Education is not about learning of facts but training young minds to think." There is a big difference between cramming up facts and learning them so that they can be applied in productive ways. At TGPCET, we try to work towards holistic development of our students by providing them the tools and experiences that encourage our students to think. The aim is to create empowered minds so that students are able to decide what is good for them, differentiate between right and wrong, choose opportunities that help build them up and enable them to live in harmony with all existence. As the Vice Principal, I am delighted that the institute's values align with my own personal values, including the importance of trust, respect, innovation and a sense of community.



ABOUT TGPCET

Tulsiramji Gaikwad-Patil College of Engineering and Technology (TGPCET) was established in the year 2007 by Vidarbha Bahu-uddeshiya Shikshan Sanstha (VBSS), a registered society. It is a self-financed Private Engineering College, which is affiliated to Rashtrasant Tukadoji Maharaj Nagpur University (RTMNU) Nagpur and is approved by All India Council for Technical Education, New Delhi. Also college is approved by Directorate of Technical Education (DTE), Mumbai, Maharashtra State. The Institute is Accredited with A+ (3.32 CGPA) by NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL (NAAC). An Autonomous Institute affiliated to RTM Nagpur University, Nagpur.



ABOUT DEPARTMENT

The Department of Mechanical Engineering provides in depth education & prepares its students for all the possible future career & developments in technology. Department has a fine blend of experienced as well as young dynamic enthusiastic personalities as faculty for providing quality education at both B.tech. (Mechanical) and M.Tech. (Mechanical Engineering Design). It aims to promote research and teaching activity based on advanced and novel teaching methods. The specious infrastructure, well equipped laboratories, meritorious students and academically qualified and enthusiastic faculty being the salient features of the Department.

MESSAGE FROM HOD DESK



Dr. Vijay Talodhikar
HOD, ME

I take this opportunity to welcome you to the department of Mechanical Engineering which was established in 2011. Our graduates work in the core area such as mining industry, thermal power industry, automobile industry, agricultural sector, shipping industries, aerospace industry and finds its utilities in IT sector for Research and Development activities to meet requirements of present industrial needs.

The primary focus is to impart quality technical educations through effective Teaching Learning process among students. The department having three sponsored Lab 3D Printing, BMW Engine Lab and CNC Lab which is obliging for the superior placement of students as per their domain wise interest. Young, dynamic and experienced faculties provide technical knowledge and facilitate the growth of students. The faculty members display a high level of dedication and enthusiasm towards both teaching and state-of-the-art research.

Department is also having 15 well equipped laboratories including a project laboratory and an Industry sponsored laboratories and research laboratory. Our faculty members have published their research articles in reputed national and international journals. The department is active in organizing the various workshops and seminars for the growth and development of faculty and students. Our department students are also highly encouraged to implement their innovative research ideas with the help of the expert faculty members.

EDITORIAL



Mr. Anuj Muley
Chief Editor

It brings me immense joy & pleasure to introduce the Eight edition of the departmental NEWSLETTER "YANTRIK". All the creative energies that came on to this platform in the form of faculty experts & students are finally presenting a replica of their enthusiastic hard work through this extravaganza that has come out so organically. Technical & Arts every section shines out differently in its true sense. All the events conducted throughout the year were perfectly planned & the overwhelming response it received said it all! This piece of art would not have been complete without the sheer determination & perseverance of all the students who pushed their limits every time to bring out this artistic reality. Their efforts coupled with immense support from the faculties truly have done justice to carry on the legacy. I am grateful for all the support NEWSLETTER "YANTRIK" has received throughout the year in every possible way from the faculties & Students. I hope the readers of NEWSLETTER have a wonderful reading experience & wish this year's edition too receives your love & support like it has always received till date.

EDITORIAL



Mr. Pratik Taiwade
Student Content Editor
Student, Final Year, ME

There is no denying that one day my memory of words will turn vague but every page of this Technical Magazine will open a box of memory so vivid! Filled with hard work, dedication & limitless time put in making this one book that I will always be grateful to NEWSLETTER "YANTRIK" will make you fall in love with drawings again! It gives me immense pleasure to bring to you an extraordinary & masterly collection of the events, activities, achievements, highlights at the college presented in the 8th Annual departmental NEWSLETTER "YANTRIK" 2024". The NEWSLETTER reflects the identity of TGPCET Mechanical Engineering department as well as gives the students & teachers a platform to explore their creativity & imagination. This work is a result of the various phases from planning to data collection to segregation to organization to proofreading to designing. I take this opportunity to express my gratitude to our HOD Dr. V. Talodhikar & Mr. Anuj Muley for their constant assistance & guidance. My sincerest thanks to all the captains, heads, mentors & the teams without whom this YANTRIK NEWSLETTER would have just been a dream. Last but the most important, you, the readers, YANTRIK NEWSLETTER would not have been what it is today without you. So, as you turn through the pages, I hope you like the curation of emotions, fervor, faith, ideas & aspirations expressed in words.

Navigating the World of Mechanical Engineering: A Guide for Students

Prof. Parmar Bakane

Assistant Professor

Introduction:

Highlight the importance of mechanical engineering in various industries and its role in technological advancements. Emphasize the growing demand for skilled mechanical engineers in the job market.

Choosing the Right Specialization:

Discuss the diverse specializations within mechanical engineering (e.g., robotics, aerospace, automotive, thermodynamics) and provide insights into how students can choose the one that aligns with their interests and career goals.

Academic Journey:

Offer tips on managing coursework, labs, and projects effectively. Highlight the significance of gaining a strong theoretical foundation along with practical skills. Discuss the importance of internships and co-op programs for real-world experience.

Hands-On Projects:

Encourage students to actively engage in hands-on projects. Discuss the benefits of participating in engineering competitions, building prototypes, and collaborating on team projects. Share success stories of innovative projects undertaken by mechanical engineering students.

Industry-Driven Skills:

Highlight the key skills that are highly valued in the industry, such as proficiency in CAD software, knowledge of materials, strong analytical and problem-solving skills, and effective communication. Provide resources for students to develop these skills.

Networking and Professional Development:

Discuss the significance of networking within the mechanical engineering community. Encourage participation in conferences, workshops, and industry events. Provide guidance on building a professional online presence and creating a strong LinkedIn profile.

Internships and Co-op Programs:

Emphasize the importance of gaining practical experience through internships and co-op programs. Provide tips on how to secure these opportunities and make the most out of them.

Preparing for the Job Market:

Offer guidance on resume building, cover letter writing, and preparing for job interviews. Discuss the importance of showcasing both technical and soft skills. Provide examples of successful resumes tailored for mechanical engineering positions.

Staying Updated with Industry Trends:

Highlight the rapidly evolving nature of the field and the importance of staying updated with the latest advancements, technologies, and industry trends. Suggest resources such as journals, blogs, and professional associations.

Conclusion:

Summarize key points and reiterate the exciting opportunities available for mechanical engineering students. Encourage a proactive and continuous learning approach throughout their academic and professional journey.

Additive Manufacturing in Mechanical Engineering: The Future of 3D Printing

Prof. Vishwjeet Ambade

Assistant Professor

3D printing, also known as additive manufacturing, has indeed revolutionized various aspects of manufacturing processes and product design in the field of mechanical engineering. Here are some key advancements and ways in which 3D printing technology is making a significant impact:

Prototyping and Rapid Iteration:

3D printing allows engineers to quickly prototype and iterate designs at a much faster pace compared to traditional manufacturing methods. This rapid prototyping capability enables faster product development cycles.

Complex Geometries and Lightweight Structures:

Traditional manufacturing techniques often have limitations when it comes to creating complex geometries and intricate designs. 3D printing excels in producing intricate structures, allowing for the creation of lightweight and optimized components that were previously challenging or impossible to manufacture.

Customization and Personalization:

3D printing enables the production of highly customized and personalized products. This is particularly valuable in industries such as aerospace and healthcare, where components or medical implants can be tailored to individual needs or specific applications.

Reduced Material Waste:

Unlike subtractive manufacturing methods, such as milling or machining, which involve removing material from a larger block, 3D printing is an additive process. This means that material is deposited only where it is needed, minimizing waste and optimizing material usage.

On-Demand Manufacturing:

3D printing facilitates on-demand manufacturing, allowing for the production of components or products as needed. This can reduce the need for large inventories and storage costs, making production more efficient and cost-effective.

Materials Innovation:

The range of printable materials has expanded significantly. In addition to plastics, advancements in 3D printing technology have enabled the use of metals, ceramics, composites, and even bio-compatible materials. This broadens the application spectrum and allows for the creation of parts with specific material properties.

Integration of Multi-Material Printing:

Some 3D printers can now simultaneously print with multiple materials, allowing for the creation of composite structures with varying properties. This is particularly useful in creating functional prototypes and end-use parts with diverse characteristics.

In-Situ Printing and Repair:

In certain industries, 3D printing is being explored for in-situ printing and repair of components. This could potentially reduce downtime and maintenance costs by printing replacement parts directly on-site.

Digital Twin Integration:

3D printing aligns well with the concept of digital twins, where a virtual model of a physical object is maintained throughout its lifecycle. This integration allows for better control, monitoring, and optimization of the manufacturing and design processes.

Industry-Specific Applications:

Different sectors within mechanical engineering, such as automotive, aerospace, and healthcare, are leveraging 3D printing for specific applications. For example, the aerospace industry uses it to produce lightweight components, while the healthcare industry utilizes it for patient-specific implants.

Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD)

Prof. Dipali Bhoyar

Assistant Professor

Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) are powerful simulation tools that play a crucial role in mechanical engineering design and analysis. These tools enable engineers to model and analyze complex physical phenomena without the need for expensive and time-consuming physical prototypes. Here are some key aspects highlighting the importance of FEA and CFD in mechanical engineering:

Early Design Evaluation:

FEA and CFD allow engineers to assess the performance of a design at an early stage in the development process. This helps in identifying potential issues and making informed design decisions before investing in physical prototypes.

Optimization of Designs:

Simulation tools enable engineers to iteratively optimize designs by exploring various parameters and configurations without the need for multiple physical prototypes. This results in more efficient and cost-effective product development.

Predictive Analysis:

FEA and CFD provide accurate predictions of how a design will behave under different conditions, such as varying loads, temperatures, and fluid flows. This helps engineers anticipate potential problems and design components that meet performance requirements.

Cost Reduction:

Using simulation tools reduces the need for extensive physical testing, leading to significant cost savings. By identifying and addressing issues early in the design phase, companies can avoid costly modifications and rework during later stages of development.

Time Savings:

Traditional design and testing processes can be time-consuming. Simulation tools allow for quicker iterations and faster design cycles, enabling engineers to bring products to market more rapidly.

Complexity Handling:

FEA and CFD are capable of handling complex geometries and boundary conditions that may be challenging or impossible to replicate in physical experiments. This makes it possible to analyze intricate designs and systems.

Understanding Physical Phenomena:

These simulation tools provide a deeper understanding of the physical phenomena at play, whether it's stress and strain in solid structures (FEA) or fluid flow and heat transfer (CFD). This insight is valuable for designing systems that meet performance and safety requirements.

Virtual Prototyping:

FEA and CFD essentially serve as virtual prototypes, allowing engineers to test and validate designs in a simulated environment. This reduces the number of physical prototypes needed and facilitates a more efficient design process.

Environmental Impact Assessment:

CFD can be used to analyze the environmental impact of designs, especially in applications like automotive aerodynamics, HVAC systems, and renewable energy devices. This helps in designing more energy-efficient and environmentally friendly products.

Interdisciplinary Analysis:

FEA and CFD can be integrated to provide a comprehensive analysis of systems involving both solid structures and fluid dynamics. This interdisciplinary approach is crucial for understanding the interactions in complex engineering systems.

Introduction:

Additive Manufacturing (AM) and 3D printing have emerged as revolutionary technologies with the potential to reshape various industries, including education. As students increasingly embrace these cutting-edge techniques, the boundaries of creativity and innovation are expanding. This article delves into the transformative power of AM and 3D printing in the realm of education, examining their applications, benefits, and the impact on student learning.

Applications in Education:**Prototyping and Design:**

AM allows students to turn their imaginative ideas into tangible prototypes. Whether designing a new product or creating a model for a class project, students can benefit from the rapid prototyping capabilities of 3D printing.

STEM Education:

AM is particularly influential in Science, Technology, Engineering, and Mathematics (STEM) education. Students can engage in hands-on learning experiences by creating 3D-printed models of complex concepts, enhancing their understanding of abstract principles.

Medical Education:

In medical education, 3D printing enables the creation of anatomical models for studying human anatomy. This immersive approach provides students with a tangible and realistic representation of the human body, enhancing their learning experience.

Art and Design:

3D printing opens up new avenues for artistic expression. Students in art and design programs can experiment with creating intricate sculptures, personalized jewelry, and unique artworks, pushing the boundaries of traditional artistic mediums.

Benefits of Additive Manufacturing in Education:**Enhanced Creativity:**

AM fosters a culture of creativity by allowing students to transform abstract concepts into physical objects. This hands-on approach encourages innovative thinking and problem-solving skills.

Real-world Application:

Students gain valuable insights into real-world applications of their knowledge. The ability to bring digital designs to life through 3D printing bridges the gap between theoretical learning and practical implementation.

Customization and Personalization:

3D printing enables the customization of learning materials to suit individual needs. Teachers can tailor educational resources, and students can create personalized tools or aids, fostering a more inclusive learning environment.

Cost-Efficiency:

AM can be a cost-effective solution for producing educational materials, reducing the expenses associated with traditional manufacturing processes. This affordability enhances accessibility for educational institutions with limited budgets.

Challenges and Future Prospects:

While the benefits of AM and 3D printing in education are vast, challenges such as the need for specialized training, material limitations, and the cost of equipment must be addressed. Additionally, ongoing advancements in these technologies promise even more exciting prospects for the future, including improved material options, faster printing speeds, and increased compatibility with various disciplines.

Conclusion:

As additive manufacturing and 3D printing continue to evolve, their integration into education provides students with unparalleled opportunities for hands-on learning and creative exploration. By leveraging these technologies, educators can inspire a new generation of thinkers, designers, and innovators, shaping a future where the boundaries of imagination are limited only by the capabilities of a 3D printer.

Introduction:

In an era dominated by technological advancements, the integration of robotics and automation in education has emerged as a transformative force. Students today are not merely consumers of technology but active participants in its creation and application. This article explores the profound impact of robotics and automation on students, shaping the way they learn, innovate, and prepare for the future.

1. The Rise of Educational Robotics:

Educational robotics has become a pivotal tool in engaging students in STEM (Science, Technology, Engineering, and Mathematics) fields. From primary education to university levels, robotics programs expose students to hands-on learning experiences. Building and programming robots not only enhance technical skills but also foster creativity, problem-solving, and teamwork.

2. Bridging the Gap Between Theory and Practice:

Robotics and automation in education bridge the gap between theoretical knowledge and practical application. Students can see the direct implementation of scientific concepts, making abstract theories tangible. This practical exposure instills a deeper understanding and a sense of accomplishment, motivating students to delve deeper into complex subjects.

3. Automation in the Curriculum:

As industries evolve towards automation, educational institutions are incorporating automation into their curricula. Students are introduced to concepts such as Artificial Intelligence (AI), machine learning, and industrial automation. Understanding these technologies prepares them for a workforce where automation is becoming increasingly prevalent.

4. Cultivating Critical Thinking and Problem-Solving:

Robotics projects often involve overcoming challenges and solving real-world problems. This fosters critical thinking skills as students learn to analyze situations, identify issues, and strategize solutions. These problem-solving abilities are crucial in preparing students for the dynamic challenges they will face in their future careers.

5. Interdisciplinary Learning:

Robotics projects encourage interdisciplinary learning, where students combine knowledge from various fields. For instance, a robotics project might involve elements of physics, mathematics, programming, and even design. This holistic approach mirrors the collaborative nature of the professional world, where individuals with diverse skills often work together on complex projects.

6. Enhancing Soft Skills:

Beyond technical skills, robotics and automation programs contribute to the development of soft skills. Students involved in group projects learn effective communication, collaboration, and leadership. These interpersonal skills are invaluable in any career and contribute to a well-rounded education.

7. Preparing for the Workforce:

Robotics and automation education equips students with the skills required in the contemporary job market. The ability to understand and work with automated systems is increasingly becoming a fundamental competency. By embracing these technologies early on, students are better prepared for the evolving demands of the workforce.

Conclusion:

In the realm of education, robotics and automation have transcended the boundaries of traditional learning. Students engaged in these programs not only gain technical expertise but also develop a versatile skill set that prepares them for a future where technology is integral to every aspect of life. As educational institutions continue to embrace these advancements, students are empowered to become the innovators and problem solvers of tomorrow's world. The fusion of robotics and education is not just a trend; it is a paradigm shift that is shaping the future of learning.

Introduction:

In an era defined by climate change and environmental consciousness, the urgency to transition towards sustainable energy sources has never been more palpable. Renewable energy technologies stand at the forefront of this transformative journey, offering a glimmer of hope for a cleaner, greener future. This article delves into the various facets of renewable energy technologies, exploring their significance, advancements, and the role they play in shaping the energy landscape of tomorrow.

Solar Power: Harnessing the Power of the Sun

Photovoltaic (PV) Cells: Understanding the technology behind solar panels and their efficiency.

Concentrated Solar Power (CSP): Exploring innovative methods of using mirrors and lenses to concentrate sunlight for power generation.

Emerging Technologies: Perovskite solar cells and other cutting-edge developments pushing the boundaries of solar energy.

Wind Energy: Capturing the Breeze

Wind Turbines: Examining the mechanics of wind turbines and their evolution over the years.

Offshore Wind Farms: Discussing the advantages and challenges associated with harnessing wind power at sea.

Small-Scale Wind Energy: Highlighting the potential for localized wind energy solutions.

Hydropower: The Dynamic Power of Water

Hydroelectric Dams: Evaluating the environmental impact and efficiency of large-scale hydropower projects.

Run-of-the-River Systems: Exploring sustainable hydropower solutions that minimize environmental disruption.

Pumped Storage: Investigating how surplus energy can be stored using water reservoirs.

Geothermal Energy: Tapping into Earth's Inner Heat

Geothermal Power Plants: Understanding how heat from the Earth's core can be harnessed for electricity generation.

Direct Use Applications: Exploring geothermal energy for heating, greenhouse farming, and other direct applications.

Enhanced Geothermal Systems (EGS): Discussing the potential for expanding geothermal energy production through advanced technologies.

Bioenergy: Fueling the Future Sustainably

Biomass: Examining the use of organic materials for energy production.

Biofuels: Investigating the development of sustainable liquid fuels from biological sources.

Anaerobic Digestion: Understanding how organic waste can be converted into biogas for energy.

Challenges and Solutions: Overcoming Hurdles in Renewable Energy

Energy Storage: Analyzing the importance of efficient energy storage solutions for intermittent renewable sources.

Grid Integration: Discussing the challenges of integrating renewable energy into existing power grids.

Policy and Investment: Highlighting the role of government policies and private investments in fostering the growth of renewable energy technologies.

The Future Landscape: Navigating the Path Ahead

Technological Advancements: Anticipating future breakthroughs in renewable energy technologies.

Global Collaboration: Emphasizing the need for international cooperation to address climate change through sustainable energy solutions.

Empowering the Next Generation: Encouraging students to actively participate in shaping the future of renewable energy through education, innovation, and advocacy.

Conclusion:

As we stand at the crossroads of environmental stewardship and technological innovation, the adoption of renewable energy technologies becomes not just a choice but a necessity. By understanding and championing these sustainable solutions, students can contribute to a future where clean and limitless energy powers a world that respects and preserves the delicate balance of our planet.

Faculty Achievements

NPTEL Certificates

Name of Faculty	Course Name	Percentage	Achievement
Prof. Anuj Muley	Computer Integrated Manufacturing	69 %	Elite Certification
Prof. Ravindra Shende	Computer Integrated Manufacturing	64%	Elite Certification
Prof. Dipali Bhoyar	Effective Writing	66%	Elite Certification
Prof. Dipali Bhoyar	Introduction to Research	64%	Elite Certification
Prof. Dipali Bhoyar	Design, Technology and Innovation	41%	Passed
Prof. Parmar Bakane	Effective Writing	62%	Elite Certification

Paper Publication

Sr. No.	Name of faculty	Title of paper	Name of Journal	Volume No	Issue No	Public ation Year	ISSN/I SBN No
1	Prof.Gaurav Nagdeve	Design and fatigue analysis of automobile alloy wheel rim of four wheelerinnovacrysta	IJTE (The Indian Journal of Technical Education)	Vol. 47	Special Issue No. 1	May-24	0971-3034
2	Mr. Vishwjeet Ambade	Design, Analysis and Optimization of Multi Station Jig for the mass production of Pump Cover	IJTE (The Indian Journal of Technical Education)	Vol. 47	Special Issue No. 1	May-24	0971-3034
3	Dr. Vijay Talodhikar, Dr. Dheeraj Deshmukh	Design Considerations of Flywheel for Future Perspective Power Deposition: A Critical Review	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034
4	Prof. Ravindra Shende, Mr. Prammar Bakane, Mr. Vivek Patil	A Comprehensive Review of the Efficiency and Practicality of Vertical Axis Wind Turbines for Domestic Energy Generation.	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034
5	Ms. Dipali Bhoyar	Design and analysis of disc brake rotor for hyundai 110 grand, xcent	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034
6	Mr. Vishwjeet Ambade	Tool design for the development of plastic product (tooth paste stand) and its structural	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034

		and mold flow analysis,					
7	Mr. Vishwjeet Ambade, Ms. Dipali Bhoyar	Compression of surface roughness of 3D printed parts of PLA and ABS filament with FDM Technology (Experimental and Regression Analysis): A Critical Review	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034
8	Mr. Prammar Bakane	A Systematical Review of the Literature On Screw Extraction from Implants During Orthopedic Surgery	Springer			02 December 2023	978-3-031-49454-3
9	Dr. Vijay Talodhikar	Design & Experimental Evaluation of Solar Assisted Candle Making Machine	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034
10	Dr. Vijay Talodhikar, Ritesh Banpurkar	A Review on Design and Analysis of Progressive Tool for Exhaust Manifold Gasket	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034
11	Dr. Vijay Talodhikar	Design, Fabrication & Testing of Solar Slurry Dryer	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034
12	Dr. Vijay Talodhikar	Design & testing of hydraulic assisted hand operated leaf plate making machine(halpmmm)	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034
13	Dr. Niteen T Kakade	Overview and Analysis of Manual Flywheel Operated Sugar Cane Juice Making Machine	IJTE (The Indian Journal of Technical Education,)	Vol. 47	Special Issue No. 1	May-24	0971-3034

Inter Departmental Project competition

<i>Name of Student</i>	<i>Project Title</i>	<i>Achievement</i>
Prayag Jangle	Design and Fabrication of Automatic Pneumatic Paper Cutting Machine.	<i>Ist Prize</i>
Devendra Mohankar		
Ankit Chouriya		
Omprakash Maskare		
Piyush Khadgi	Design and Fabrication of Hydraulic Spring Compressive Stiffness testing Machine.	<i>IInd Prize</i>
Yash Jagtap		
Krushnakant Raut		
Rushikesh Wanjari		

Best Student Project

The List of Final year Projects:

<i>Name of Student</i>	<i>Project Title</i>
Nikhil Ninawe	Design and Fabrication Electric Wheelchair with Bluetooth and voice control.
Kartik Chahande	
Aditya Deotare	
Atharva Inzalkar	
Sachinkumar Tiwari	Design And Fabrication of Manually Operated Turmeric Peeling Machine.
Jyotish Mohatkar	
Vicky Kosme	
Dikshit Rahangdale	
Piyush Khadgi	Design and Fabrication of Hydraulic Spring Compressive Stiffness testing Machine
Yash Jagtap	
Krushnakant Raut	
Rushikesh Wanjari	
Ganesh Nikhade	Design and Fabrication of Pneumatic reciprocating Water Pumping system.
Aman Thavkar	
Anuj Patle	
Yelish Gajbhiye	
Prayag Jangle	Design and Fabrication of Automatic Pneumatic Paper Cutting Machine.
Devendra Mohankar	
Ankit Chouriya	
Omprakash Maskare	
Kailas Wadje	Development of phase change material based solar energy storage system.
Sameer Kapale	
Achal Dhabarde	
Pallavi Bagade	
Abhishek Kukwase	Design and Fabrication Of Safety lift Mechanism.
Akash Meshram	
Aman Sharma	
Arya Koparkar	
Chetan Chaware	Design and fabrication of Go Electric car by using PVC pipes.
Dhanpal Barve	
Hanmant Narmod	
Himanshu Gothe	
Jaikumar Naidu	Design And Fabrication of Milti-purpose trolley -cum-wheelchair by using four bar mechanism.
Kamalkishor Tembhare	
Mayur Raut	
Mayur Nakshine	
Mohit Kanekar	Design and Fabrication of Automatic Spring Rolling Machine.
Prantesh Kahurke	
Rohit Kadu	
Rohit Warche	
Suraj Barapatre	
Vijay Gaddamwar	

CO-CURRICULAR ACTIVITIES

FORUM REINSTALLATION(ROBUST)

It has been said that forum re-installation of ROBUST can be an excellent way to "try out" a certain career and in the view of that the Department of Mechanical Engineering of Tulsiramji Gaikwad-Patil College of Engineering and Technology (TGPCET) has conducted forum re-installation of ROBUST on 29th November 2023. Forum re-installation offer students a hands-on opportunity to work in their desired field. They learn how their course of study applies to the real world and build a valuable experience that makes them stronger candidates for jobs after graduation.

The forum re-installation of ROBUST has been started with the welcoming the guest Mr. Gaurav Lanjewar, Sr. Engineer at AMCL, Buttibori MIDC, Nagpur. The head of Mechanical Engineering has given an introduction about Mr. Gaurav Lanjewar sir and then he started his lecture on forum re-installation.

He has shared knowledgeable and useful information about of forum re-installation of ROBUST and appreciation of selected members of forum and encourage to selected member. As per annual elections of forum, the newly elected committee of "ROBUST" comprises President Mr. Pratik Taiwade, Vice President Miss Brinda Talhar, Treasurer Mr. Atulesh Patil and Secretary Mr. Kartik Bagade. Students of third year & final year get highly motivated after the session of Mr. Gaurav Lanjewar sir and find out the session very useful for their future career perspective.

Dr. Mohan Gaikwad-Patil, Chairman GPG, Prof. Sandeep Gaikwad, Treasurer, GPGL, Prof. P. L. Naktode, Principal, Prof. Pragati Patil, Vice-Principal and Prof. Ritesh Banpurkar Dean IQAC appreciated the faculty members for taking this initiative of conduction of forum re-installation of ROBUST. This forum re-installation was organized under the guidance of the Dr. Vijay Talodhikar, Head of Mechanical Engineering Department and coordinated by Dr. Yogesh Mahulkar, Assistant Professor and Prof. Anuj Muley, Assistant Professor, in Mechanical Engineering Department.





Industrial visit at Shilpa Steel & Power, Buttibori MIDC, Nagpur



Industrial visit at RCOEM-TATA-CIIIT, Nagpur



Industrial visit at Indorama Buttibori MIDC, Nagpur

INDUSTRIAL VISIT 2023-24



Industrial Visit arranged at Br. Sheshrao Wankhede Shetkari Soot Girni Ltd. Borkhedi



Industrial Visit arranged at Br. Sheshrao Wankhede Shetkari Soot Girni Ltd. Borkhedi

Guest Lecture 2023-24



Guest lecture on the topic "Industry 4.0" by Mr. Jogeshwar Dey, Dy. Manager Mahindra & Mahindra Tractor Division, Hingna MIDC,



Guest lecture on "Importance of CV and Career Opportunities in Mechanical Engineering" by Mr. Anil Ramakant Jain, Development Manager, Virtual Simutech Pvt. Ltd., Pune.



Guest Lecture: World Aids Day by Dr. Shilpa A. Deshpande Associate Professor



Poster Competition on World Aids Day

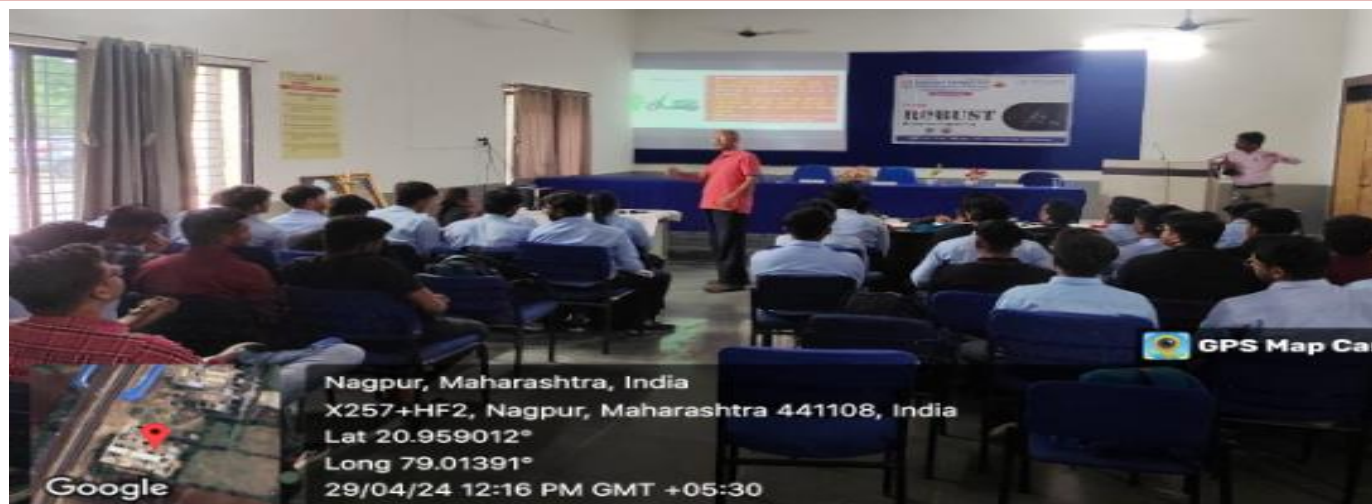


Guest Lecture: Additive Manufacturing By Mr. Gaurav Lanjewar, Sr. Engineer AMCL Buttibori MIDC Nagpur



Installation & Guest lecture on SAE India by Mr. Vivek Shrouthy General Manager Evonith Steel Wardha

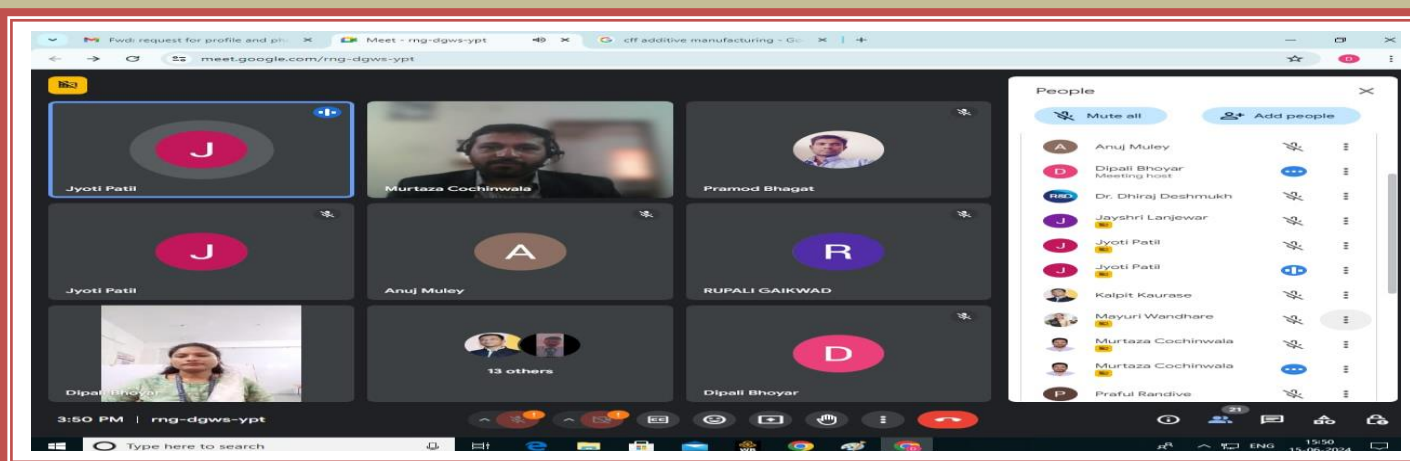
Workshop 2023-24



**“Hands on Training on Electric Vehicle” by Mr. Bishnu Darnal
Sr. Manager Tranee At Mahindra & Mahindra Nagpur**



Two days' Workshop on ANSYS and CREO by Mr. Piyush Piprikar, Technical Head,CADD Centre



One week online FDP Recent Advancement in 3D Printing & its Application with guest of Mr. Murtaza Cochinwala, Director Institute of Industrial Design , Nagpur

Parents Teacher Conclave 2023-24



Department Achievements 2023-24

Niteen Kakade



NITEEN Kakade,
Assistant Professor,
Mechanical Engineering,
Tulsiramji Gaikwad Patil College of

Engineering and Tehnology, completed PhD in topic 'Design, Modeling and Analysis of Low Cost Split Pigeon Pea (Tur Dal) Production Machine with Combined Operations' from G H Raisoni University, Amravati, under guidance of Dr Shahare and Dr G K Awari. He gives credit to Dr Mohan Gaikwad-Patil, Chairman GPG, Dr Sandeep Gaikwad, Treasurer-GPGI, Dr Naktode, Principal-TGPCET, Prof Pragati Patil, Vice-Principal and family.

Mr. Niteen Kakde, Faculty of ME Awarded Ph.D Degree



Students of final Year won first prize in project competition



Students of final Year won Second prize in project competition



Mr. Ritesh Banpurkar, Faculty of ME Patent file "HUMAN POWERED POT MAKING MACHINE"



Department Achieved NBA Accreditation for three

III -SEM AUTONOMOUS TOPPERS

Rank	Name of Student	Marks	Percentage %
I	Vaibhav Chaudhari	548/650	84.30 %
II	Aishwarya Sahare	543/650	83.53 %
III	Shruti Bawane	532/650	81.84 %

V -SEM AUTONOMOUS TOPPERS

Rank	Name of Student	Marks	Percentage %
I	YASH VINOD BUTKE	587/700	83.85%
II	PRATIK NARENDRA TAYWADE	576/700	82.28%
III	TANAY JITENDRA SINGH	479/700	68.42%

VII -SEM TOPPERS

Rank	Name of Student	Marks	Percentage %
I	Jyotish Ramesh Mohitkar	535/600	89.16%
II	Piyush Pramod Khadgi	473/600	78.83%
III	Dikshit Choplal Rahangdale	465/600	77.50%

Expert talk on exposure to green sand casting process held

The department of mechanical engineering of Tulsiramji Gaikwad-Patil College of Engineering and Technology (TGPCET) conducted an expert lecture on the topic 'Exposure to Green Sand Casting Process and its Application in Automotive Industry'. The lecture was organized under the guidance of Dr Vijay Talodhikar, Head of Mechanical Engineering Department and coordinated by Asst Prof Dr Yogesh Mahulkar and Asst Prof Pramod Bakane of Me-



Dr Sanjay Aloni being welcomed by a student.

chanical Engineering Department.

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बोथलीत पोषण जनजागृती अभियान

◆ गुमगाव, २४ सप्टेंबर
राष्ट्रीय सेवा योजना आणि महिला व बाल विकास मंत्रालय, भारत सरकार यांच्या निर्देशानुसार, राष्ट्रीय सेवा योजना युनिट आणि तुळशीरामजी गायकवाड-पाटील कॉलेज ऑफ इंजिनीअरिंग अँड टेक्नॉलॉजी, नागपूरच्या मेकॅनिकल विभागाच्या वतीने पोषण आणि जनजागृती कार्यक्रमाचे आयोजन करण्यात आले होते.

यावेळी बोथली गावातील गरोदर आणि स्तनदा मातांची तपासणी करण्यात आली. गावात सप्टेंबर महिना राष्ट्रीय पोषण माह म्हणून साजरा केला जातो यावेळी डॉ फॅमिंग डॉ गेली

विद्यार्थ्यांनी ग्रहण केले औद्योगिक क्षेत्रातील अनु



गुमगाव ■ रिकॉम टाटा सीआयआयआयटी सेंटर फॉर एक्सलन्स ला औद्योगिक भेट देवून विद्यार्थ्यांनी औद्योगिक क्षेत्रातील अनुभव ग्रहण केले. औद्योगिक क्षेत्र भेट कार्यक्रम तुळशीरामजी गायकवाड-पाटील अभियांत्रिकी

आणि तंत्रज्ञान महाविद्यालयातील संगणक विज्ञान व डेटा सायन्स विभागातर्फे आयोजित करण्यात आली.

संगणक विज्ञान-डेटा सायन्सच्या द्वितीय वर्षाच्या विद्यार्थ्यांनी मशीन लर्निंग, सेन्सर्स, रोबोटिक्स आणि

आयओटी लॅबद्वारे यावेळी विद्यार्थ्यांच्या निरसन करण्यात आले वानखेडे आणि प्रा.उ यांनी सॉफ्टवेअर देखभाल व विकास दिल्ली. (वार्ताहर)

देवोन्मती

पाटील महाविद्यालयात शिक्षक-पालक मेळावा

गुमगाव ■ तुळशीरामजी गायकवाड पाटील अभियांत्रिकी महाविद्यालयात यांत्रिकी विभागातर्फे अभियांत्रिकीच्या विद्यार्थ्यांसाठी

तारुण भारत

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इलेक्ट्रिकल, मेकॅनिकल विभागांना एनबीए मान्यता

गुमगाव : तुळशीरामजी गायकवाड-पाटील अभियांत्रिकी आणि तंत्रज्ञान महाविद्यालयातील इलेक्ट्रिकल आणि मेकॅनिकल इंजिनीअरिंग या दोन्ही विभागांना नॅशनल बोर्ड ऑफ ऑक्रेडिटेशनकडून तीन वर्षांच्या कालावधीसाठी एनबीए मान्यता मिळाली आहे. संस्थेतील दोन्ही विभागांना नुकतीच तज्ज्ञ समितीने भेट दिली होती. हे यश संस्थेचे प्राध्यापक, कर्मचारी आणि विद्यार्थ्यांच्या समर्थित प्रयत्नांनी साध्य झाले. या यशाबद्दल गायकवाड पाटील गुपचे अध्यक्ष डॉ. मोहन गायकवाड-पाटील, उपाध्यक्ष आकाश गायकवाड-पाटील, कोषाध्यक्ष डॉ. संदीप गायकवाड यांनी संस्थेच्या सर्व कर्मचाऱ्यांचे अभिनंदन केले.

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टाकाऊ वस्तूपासून बनविली सरस्वती मातेची आकर्षक मूर्ती

◆ गुमगाव, ११ सप्टेंबर
कार्यशाळा शिक्षक कुसुपाल राणे यांनी यांत्रिकी विभागाच्या विद्यार्थ्यांच्या सहकायाने टाकाऊ वस्तूपासून विद्येची देवता सरस्वती मातेची आकर्षक मूर्ती तयार केली. ही मूर्ती तयार करण्याकरिता



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खेळांमधूनच व्यक्तिमत्त्व विकास शक्य



डॉ. शरद सुर्ववंशी यांचे प्रतिपादन

◆ गुमगाव, ६ फेब्रुवारी
तुळशीरामजी गायकवाड पाटील अभियांत्रिकी व तंत्रज्ञान महाविद्यालयातर्फे आयोजित करण्यात आलेल्या अर्थीक संवेदनशील

संमेलनाचा उद्घाटनप्रसंगी महाविद्यालयातील प्राचार्य पी. एल. नाकतोडे, उपप्राचार्य प्रगती पाटील, शैक्षणिक विभागाचे अध्यक्ष अनूप गाडे, अध्यक्षपुत्री अध्यक्ष विलेय वनकर, यांत्रिकी विभाग अध्यक्ष डॉ. विजय लळोदीकर, डॉ. प्रशांत ठाकरे, कीडा तयारी विभाग अध्यक्ष डॉ. सौरभ

सांगितले. पदास्वितेसाठी कीडा प्रभारी निखिल नागोसे यांच्या मार्गदर्शनात विद्यार्थी, शिक्षक कर्मचाऱ्यांचे सहकार्य लाभले. यावेळी संस्थेचे उपाध्यक्ष डॉ. मोहन गायकवाड, उपाध्यक्ष आकाश गायकवाड, अधिवक्ता डॉ. संदीप गायकवाड यांनी

देवोन्मती

गायकवाड पाटील महाविद्यालयात वेब तंत्रज्ञानावर अतिथी व्याख्यान



गुमगाव ■ तुळशीरामजी गायकवाड-पाटील अभियांत्रिकी आणि तंत्रज्ञान महाविद्यालयातील संगणक विज्ञान आणि अभियांत्रिकी विभागाने वेब तंत्रज्ञानावर आयोजित अतिथी व्याख्यान नुकतेच पार पडले. रेवत

व्यावहारिक अनुप्रयोग यांच्यातील अंतर भरून काढण्यासाठी अतिथी व्याख्यान हा एक महत्त्वपूर्ण प्रयत्न होता. डोमेनमधील अनुभवी तज्ज्ञ पुना अरोरा यांनी वेब टेक्नॉलॉजीच्या डायनॅमिक क्षेत्रातील विविधांगी माहिती

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यांत्रिकी विभागातर्फे 'ऑडिटिव्ह मॅन्युफॅक्चरिंग' विषयावर व्याख्यान

◆ गुमगाव, १३ डिसेंबर

तुळशीरामजी गायकवाड-पाटील अभियांत्रिकी आणि तंत्रज्ञान महाविद्यालयाच्या यांत्रिकी विभागातर्फे 'ऑडिटिव्ह मॅन्युफॅक्चरिंग' विषयावर व्याख्यान आयोजित करण्यात आले होते. कार्यक्रमाला प्रमुख पाहुणे म्हणून वरिष्ठ अभियंता गौरव लांजेवार होते. या सत्रात विद्यार्थ्यांना अभ्यासक्रमाच्या पलीकडे भविष्यातील तंत्रज्ञान आणि अपघोष केलेल्या

