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TULSIRAMJI GAIKWAD-PATIL
College of Engineering & Technology
Approved by AICTE, New Delhi and Govt. of Maharashtra | An ISO9001:2015 Certified Institution
Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
AN AUTONOMOUS INSTITUTE

AERONAUTICA INSIGHT

Shaping Aerospace Frontiers - 2026

Vol-01, Issue-01

GAIKWAD-PATIL
GROUP OF INSTITUTIONS

Vision & Mission

Vision of the Institute

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

Mission of the Institute

- 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 of the Department

To foster technically skilled Aeronautical Engineers of the utmost academic principles, to convene the needs of academia, industry and society.

Mission of the Department

- Impart quality technical education and unique inter disciplinary experiences.
- Develop the analytical, computational and design capabilities to provide
- sustainable solutions. Expose the students to the current trends and

  opportunities in the Aerospace industry.
- Inculcate professional responsibility based on an innate ethical value system.

PEO's & PSO's

PEO's

Graduates will be able to

PEO1: Undergraduate students will acquire knowledge to investigate and solve Aeronautical Engineering problems using basics of applied science and engineering.

PEO2: Undergraduate students will utilize the modern technology and techniques to explore new skills and ideas to satisfy the need of society as well as industry.

PEO3: Undergraduate students will get finest employment opportunities in the field of Aeronautical Engineering.

PEO4: To develop the environment of societal and ethical values to concern with engineering issues.

PEO5: Under graduate students will contribute in the domain-specific and inter-disciplinary research through the project based learning.

PSO's

Graduates will be able to

PSO 1: Develop profound working knowledge to solve a combination of complex problems in aerodynamics, propulsion, structures, flight mechanics and allied courses.

PSO 2: Be equipped to use CAE packages, simulation languages and advanced tools to solve practical design and analysis problems.

PSO3: Undergraduates will be able to utilize the extensive knowledge of design, manufacturing, testing or maintenance of systems and subsystems to pursue a career in aeronautical engineering.

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. The 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.

The College offers four years UG programs in Nine disciplines of engineering viz. Bio-Technology(B.Tech), Aeronautical Engineering (AE), Computer Science and Engineering (CSE), Information Technology (IT), Electronics and Communication Engineering (ECE), Mechanical Engineering (ME), Civil Engineering (CE), Electrical Engineering (EE) Computer Science and Engineering (Data Science).

TGPCET offers Eight PG programs in engineering viz. Computer Science and Engineering (CSE), Integrated Power System (IPS), Structural Engineering (SE), Electronics and Communication Engineering (ECE), Artificial Intelligence, Machine Learning (AIML) & Mechanical Engineering design(MED), Aeronautical Engineering(AERO) and Electric Vehicle (EVT) and also offers Two years PG programs in Master of Business Administration(MBA)as well as Two Years Master in Computer Application(MCA).

In addition, TGPCET conducts three years Diploma programs in six disciplines of engineering such as Civil Engineering (CE), Mechanical Engineering (ME), Computer Science and Engineering (CSE) and Electrical Engineering (EE), Electronics and Communication Engineering (ECE) and Information Technology (IT).

College is located in the midst of Multimodal International Cargo Hub and Airport (MIHAN) and also in the vicinity of Butibori Industrial area, Nagpur.

This sanstha is started by the dedicated and renowned academicians genuinely committed to impart quality technical education to the students, who are aspiring for carrier in Engineering, Technology and Management.

Collegeoffersadditionalcoursesbeyondsyllabustoexposethestudentstowardstheindustrialclimateby conducting courses in C++ with PYTHON, C#.NET, Java, Oracle-SQL and Administration, CCNA, PLC SCADA, MATLAB, AUTOCAD,STAADPRO,CREO,PHP.

The college has signed MoU with Charusat University, Gujrat Dr. Panjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola and Vignan's University, Guntur to excel the academic and research capability of staff and students in the emerging fields of Science, Engineering and Agriculture.

The staff having versatile rich experience in teaching, research and industry are educating students of all sections of society to foster Quality Education and to build high moral standards.

About Department

The Department of Aeronautical Engineering was established in 2020 with an intake of 60 students in the UG course. The department has also started a PG program in Aeronautical Engineering with an intake of 12 in the year 2023. Aeronautical engineering involves researching, designing, constructing, testing, and manufacturing of the aircraft within Earth's atmosphere. It also covers the investigation into aerodynamic elements of aircraft, including behaviors and related factors such as control surfaces, lift, airfoil, and drag. The Department aims to cultivate expertise in specialized fields within aeronautical engineering, including aircraft structural design, aerodynamics, propulsion systems, and guidance and control systems, with an emphasis on research and innovation.

The aeronautical engineering department features several specialized labs: Aero-Thermodynamics Lab, Fluid Mechanics and Machinery Lab, Aerodynamics Lab, Aircraft Structures Lab, Propulsion Lab and CAD/CAE Lab, offering students hands-on experience in advanced research and practical applications. The department has well qualified and experienced faculties from IITs, NITs and Government institutes having excellent academic as well as research contribution. The aeronautical engineering department offers a vibrant and enriching environment for students.

The student-run Aerocious forum hosts guest lectures and workshops, while the drone club organizes competitions and projects, providing opportunities for practical experience and fostering innovation in drone technology and applications. The department encourages students to engage in research and publish papers. They are also motivated to participate in international and national conferences, providing them with valuable opportunities to present their work, network with industry professionals, and stay informed about the latest advancements in the field.

MESSAGE

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 Vidarbh. 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 constants 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.

Dr. Pragati Patil Bedekar
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.

HoD Desk

It is with great pleasure and enthusiasm that I extend a warm welcome to each of you as we embark on yet another exciting edition of "Aeronautica Insight," the official magazine of the Aeronautical Engineering Department at TGPCET, Nagpur.

As the Head of the Aeronautical Engineering Department, I take immense pride in presenting this platform that encapsulates the spirit, achievements, and aspirations of our vibrant department. "Aeronautica Insight" serves as a window into the world of aeronautical innovation, academic prowess, and collaborative endeavors that define our department's identity.

Aeronautical Engineering is a field that thrives on the pursuit of knowledge and the relentless quest for pushing the boundaries of what is possible. In this edition, we showcase the academic excellence achieved by our students and faculty, both in the classrooms and through groundbreaking research initiatives. From theoretical concepts to real-world applications, we aim to provide our readers with a comprehensive view of the dynamic field of Aeronautical Engineering.

Our faculty members, who are not only educators but also mentors and guides, play a pivotal role in shaping the academic journey of our students. Through their dedication and expertise, they inspire a love for learning and foster an environment where curiosity and critical thinking are celebrated.

"Aeronautica Insight" also highlights the numerous extracurricular activities, workshops, and events that contribute to the holistic development of our students. We believe in nurturing well-rounded individuals, and this magazinereflectsthemyriadtalentsandachievementsofourstudentsbeyondtheacademicrealm.

Collaboration lies at the heart of innovation, and we are proud to showcase the partnerships and collaborations that our department has forged with industry leaders, research institutions, and alumni. These collaborations not only provide valuable opportunities for our students but also contribute to the advancements in aerospace technology.

I extend my gratitude to the editorial team for their tireless efforts in curating this magazine, and to all contributors for sharing their insights and experiences. "Aeronautica Insight" is not just a publication; it is a testament to the collective spirit and achievements of the Aeronautical Engineering Department at TGPCET.

I encourage all readers to delve into the pages of this magazine, explore the stories within, and gain a deeper understanding of the exciting world of Aeronautical Engineering. May this edition inspire you, inform you, and spark your curiosity. Wishing you an enlightening and enjoyable reading experience!

Prof. Vishwajeet Ambade, B.E., M-Tech, PhD*.
Assistant Professor and Head of

Editor Desk

Welcome to the latest edition of "Aeronautica Insight," the heartbeat of the Aeronautical Engineering Department at TGPCET. As editors, it is our privilege to present a tapestry of narratives that reflect the dynamic and ever-evolving natureofaerospacetechnologyandthecollectivespiritofouracademiccommunity.

In the realm of Aeronautical Engineering, where innovation meets precision, every project is a journey, every challenge is an opportunity, and every discovery is a triumph. As you flip through the pages of this magazine, we invite you to embark on a journey with us—an exploration of the frontiers of aerospace science and engineering.

Our contributors, adverse and talented group of individuals, have poured their passion in to these pages. From insightful research articles to captivating stories of personal experiences, each piece offers a unique perspective on the multifaceted world of Aeronautical Engineering. We extend our sincere gratitude to these individuals for sharing their expertise, shedding light on complex concepts, and bringing the magic of aviation to life.

At the heart of our department is a community of dedicated faculty, staff, and students who work tirelessly to push the boundaries of knowledge. "Aeronautica Insight" is a celebration of their achievements, a showcase of their collaborative efforts, and a testament to the pursuit of excellence that defines our academic environment. We believe in nurturing not only skilled engineers but also creative thinkers, problem solvers, and leaders who will shape the future of aerospace technology.

This magazine is more than just a compilation of articles; it is a reflection of our commitment to fostering a holistic learning experience. Beyond the classroom, we highlight the extracurricular activities, workshops, and events that contribute to the all-encompassing development of our students. It is in these diverse experiences that future leaders in Aeronautical Engineering are forged.

As editors, we would like to express our gratitude to the entire editorial team for their dedication and hard work. Designers, writers, photographers—each played a crucial rol0- bringing this publication to life. Their creative efforts have given "Aeronautica Insight" a visual and narrative richness that we hope you will find engaging and inspiring.

To our readers, we extend an invitation to immerse yourselves in the stories within these pages, to explore the challenges and triumphs, and to share in the excitement of Aeronautical Engineering. Thank you for being a part of our journey, and we hope you find this edition of "Aeronautica Insight"
both informative and enjoyable.
Happy reading!

Prof.Jonna Naresh
B.E.,M-Tech., PhD*

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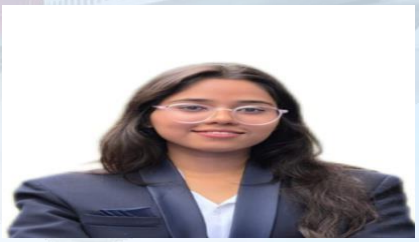

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Index

rheological Elastomers for Next-Gen Aerospace Stability

In the relentless pursuit of safer and more efficient aerospace structures, innovation often lies in smart materials. One such advancement is the integration of Magneto rheological Elastomers (MREs) into rotating composite sandwich blades—offering intelligent vibration damping and adaptive structural performance. This research investigates the aero elastic stability of rotating tapered composite sandwich blades embedded with MRE cores under supersonic flow conditions.

The study explores the aero elastic response and dynamic stability of carbon-epoxy composite blades with varying MR core configurations. The unique aspect of the research lies in its examination of non-conservative axial loads and magnetic field influences on blade performance during high-speed rotation.

The blade is modeled using Timoshenko beam theory, capturing shear deformation and rotary inertia effects. A finite element method (FEM) is developed to simulate vibration and flutter behavior under complex loading scenarios. Material configuration: 4-ply laminated carbon-epoxy face sheets sandwiching an MRE core. To ensure credibility, preliminary FEM results are validated through: Laboratory-scale experimental setup, 3D finite element analysis for high-fidelity verification.

These steps establish a strong foundation for real-world applicability of the findings. The analysis highlights the influence of the following parameters on critical aerodynamic pressure and damping:
Magnetic field intensity, Taper ratio of the blade, MR layer thickness, Rotational speed
A complex interaction of centrifugal forces, aerodynamic loads, and magneto elastic forces defines the dynamic response of the blade. A neural network-based surrogate model is trained to map the input-output relationship between design parameters and blade performance. Using this model: A genetic algorithm is applied for multi-objective optimization. The goal is to maximize aerodynamic stability and enhance damping capabilities.
This study marks a significant step toward intelligent rotor blade design for helicopters and turbo machinery, where real-time adaptability and aero elastic robustness are critical. The integration of MREs provides a pathway to programmable damping and adaptive response under extreme aerodynamic conditions, potentially revolutionizing modern aero elastic applications.

Prof. Naresh Jonna
Assistant Professor

Aero-Thermal Analysis in Jet Engines

Jet engines represent the pinnacle of thermal-fluid engineering, where the principles of thermodynamics meet the demands of high-speed propulsion. The thermal behavior of air as it flows through a jet engine is a critical factor in determining the engine's performance, fuel efficiency, and reliability. This article explores the aero-thermal fundamentals in jet propulsion, the Brayton cycle, and advanced turbine cooling techniques.

At the heart of jet propulsion is the Brayton Cycle, an idealized thermodynamic cycle that models the operation of a gas turbine engine. It involves four key processes:

Isentropic Compression (via the compressor)

Constant Pressure Combustion (in the combustion chamber)

Isentropic Expansion (through the turbine)

Exhaust to produce thrust (via the nozzle)

Each of these steps involves heat transfer and pressure variations that are crucial for thrust generation and engine efficiency. As air passes through the compressor, it is pressurized and its temperature rises. In the combustion chamber, this high-pressure air mixes with fuel and is ignited, reaching temperatures of over 1500°C. The turbine then extracts energy from these hot gases to power the compressor and other systems.

Thermal efficiency and material integrity depend on:

Managing peak combustion temperatures

Minimizing thermal losses

Controlling flow dynamics and heat transfer across components

Turbine Cooling Techniques

Since turbine blades are exposed to extreme heat, cooling becomes a vital engineering task.

Real-World Applications

Jet engines such as the GE90 (used in Boeing 777) or Rolls-Royce Trent XWB (Airbus A350) showcase advanced thermal management and turbine cooling designs. These engines optimize combustion efficiency while keeping structural integrity intact under extreme thermal loads.

Moreover, military aircraft like the F-22 Raptor use variable-cycle engines and advanced cooling to maintain performance during super cruise and stealth operations.

Prof. Mayuri Wandhare Dhoble
Assistant Professor

B.Tech | B.Arch | M.Tech | MBA | MCA | Polytechnic | BAMS | D.Pharm | B.Pharm | B.ScNursing | Physiotherapy

"Evolution and Components of Modern Aircraft Navigation Systems"

Navigation is the backbone of aviation. Without accurate and reliable navigation systems, aircraft would be unable to safely traverse global skies, especially under poor visibility or over long distances. From traditional compasses to satellite-based positioning, aircraft navigation systems have evolved into sophisticated technologies that ensure safety, efficiency, and accuracy in every flight.

Evolution of Aircraft Navigation

Dead Reckoning-Early aviators used estimates of time, speed, and direction to calculate position—a technique known as dead reckoning.
Radio Navigation-The introduction of VOR (VHF Omni directional Range) and DME (Distance Measuring Equipment) allowed aircraft to fix their positions using ground-based stations.
Inertial Navigation Systems (INS)-By using gyroscopes and accelerometers, INS allows navigation without relying on external signals—ideal for long-distance or military flights.
Global Positioning System (GPS)-Today, GPS has revolutionized navigation by offering real-time, satellite-based position tracking with remarkable accuracy, often within a few meters.

Major Components of Modern Navigation Systems

VOR/DME Receivers-Help pilots determine aircraft bearing and distance from ground stations.
Flight Management System (FMS)-Integrates GPS, INS, and navigation databases to automate flight planning and execution.
Attitude and Heading Reference Systems (AHRS)-Provide 3D orientation data using gyros and magnetometers.
Autopilot Integration-Allows navigation data to guide flight paths, especially on commercial airliners.
Air Data Computers (ADC)-Provide altitude, airspeed, and temperature, aiding accurate navigation.
Role of Satellite Navigation (GNSS)
Most modern aircraft use GNSS (Global Navigation Satellite Systems)—including GPS, GLONASS, Galileo, and BeiDou—to determine precise global positions. Aircraft use WAAS/EGNOS systems to improve GPS accuracy and integrity for precision approaches.

Example:

During low-visibility conditions, a GPS-based RNP approach allows landing without reliance on ground-based ILS infrastructure.

Application in Commercial and Military Aircraft

Commercial Aviation-Airlines use advanced FMS linked to GPS and inertial systems for fuel-efficient routing, time-based arrivals, and terrain avoidance .Military Aviation-Stealth aircraft use INS-GPS hybrid systems with anti-jamming features and encrypted positioning. UAVs and Drones Rely on lightweight GPS/IMU combos for autonomous navigation, enabling missions in remote or hazardous areas.

Prof. Shrikant D. Kathwate
Assistant Professor

Case Study: Deployment of UAV Swarms in Post-Earthquake Disaster Response

Background

On October 30, 2020, a 7.0 magnitude earthquake struck the Aegean Sea, affecting parts of Greece and Turkey. In the wake of the disaster, traditional ground-based rescue efforts were hindered due to collapsed infrastructure, blocked roads, and continued aftershocks. In this complex environment, Unmanned Aerial Vehicles (UAVs) proved invaluable.

Objective

To evaluate the effectiveness of deploying UAV swarms for rapid situational assessment, search and rescue operations, and humanitarian aid delivery.

UAV Systems Used

Fixed-Wing UAVs: Long-range surveillance with high-endurance flight time (up to 10 hours).
Quadcopters/Multirotors: High maneuverability, ideal for urban mapping and close-range observation.
Hybrid VTOL UAVs: Used for parcel delivery (food, water, medicine).

Payloads included:

- Multispectral and thermal imaging cameras
- 3D LiDAR scanners
- Communication relay modules
- Emergency supply drop mechanisms

Implementation Strategy

Swarm Intelligence: A network of over 20 UAVs operated semi-autonomously using a decentralized command protocol. Swarm behavior allowed area coverage up to 100 km^2 within 2 hours.
Edge AI Integration: Onboard AI systems classified debris, detected human movement, and identified heat signatures.
Real-time Data Relay: UAVs transmitted information to a central control unit via satellite uplinks and mobile LTE networks.

Outcomes

Victim Localization: Over 150 people located within 24 hours by analyzing thermal and acoustic signals.
Aid Efficiency: Over 300 kg of supplies delivered to 40 inaccessible zones.
Mapping and Damage Assessment: Generated high-resolution 3D models for structural engineers within 48 hours.

Prof. Himani Harpal

Assistant Professor

Sustainable Aviation: Powering Flight Toward a Net-Zero Future

As global attention intensifies on climate change and environmental responsibility, the aviation industry faces a defining challenge: how to continue growing while drastically reducing carbon emissions. Sustainable Aviation has emerged as a critical pathway toward achieving net-zero goals, combining innovations in Sustainable Aviation Fuels (SAF), electric and hybrid propulsion, and advanced aircraft design. For aeronautical engineers, this transition represents one of the most impactful engineering revolutions of the 21st century.

Why Sustainability Matters in Aviation

Aviation currently contributes approximately 2–3% of global CO_2 emissions, a figure expected to rise with increasing air travel demand. Unlike ground transportation, aviation faces unique constraints such as high energy density requirements, long operational ranges, and stringent safety regulations. As a result, sustainable solutions must balance performance, safety, economics, and environmental impact.

Key Technologies Driving Sustainable Aviation

1. Sustainable Aviation Fuels (SAF)

SAF are bio-based or synthetic fuels that can reduce lifecycle carbon emissions by up to 80% compared to conventional jet fuel. These fuels are compatible with existing aircraft and infrastructure, making them a near-term solution.

- Feedstocks include used cooking oil, agricultural waste, algae, and municipal solid waste.
- Airlines like United Airlines, Lufthansa, and Air France-KLM have already conducted commercial flights using SAF blends.
- ASTM certification currently allows up to 50% SAF blending with conventional Jet A fuel.

2. Electric and Hybrid-Electric Aircraft

Electric propulsion promises zero in-flight emissions and significantly reduced noise levels, making it ideal for short-haul and regional operations.

- Fully electric aircraft are currently limited by battery energy density.
- Hybrid-electric systems combine conventional engines with electric motors to improve efficiency and reduce fuel burn.
- Companies like Airbus, Rolls-Royce, and startups such as Heart Aerospace are actively developing electric and hybrid platforms.

Miss Ishwari Ninave
6th Sem Student

B.Tech | B.Arch | M.Tech | MBA | MCA | Polytechnic | BAMS | D.Pharm | B.Pharm | B.ScNursing | Physiotherapy

Hypersonic Flight: Redefining Speed in Aerospace Engineering

Hypersonic flight, defined as speeds greater than Mach 5, represents the next frontier in aerospace technology. At such extreme velocities, vehicles experience intense aerodynamic heating, complex shock–boundary layer interactions, and highly nonlinear flow behavior. Overcoming these challenges has positioned hypersonics as one of the most demanding and exciting domains in modern aeronautical engineering.

Technology and Applications

Hypersonic vehicles primarily fall into two categories: hypersonic glide vehicles and air-breathing hypersonic cruise vehicles. Scramjet (Supersonic Combustion Ramjet) engines are central to sustained hypersonic flight, allowing combustion to occur in supersonic airflow. These systems eliminate the need for onboard oxidizers, improving efficiency for high-speed atmospheric travel.

Applications extend beyond defense into space access and high-speed civil transportation. Hypersonic point-to-point travel could reduce intercontinental flight times from hours to minutes, fundamentally altering global connectivity.

Global and Indian Developments

Countries such as the United States, China, and Australia are actively testing hypersonic platforms. India has made notable progress through ISRO and DRDO, particularly with the Hypersonic Technology Demonstrator Vehicle (HSTDV), which successfully validated indigenous scramjet technology.

Opportunities for Students

Hypersonics demands expertise in aerodynamics, propulsion, materials science, and thermal management. For aeronautical students, it offers opportunities to work on cutting-edge problems where theory, experimentation, and simulation converge.

Hypersonic flight is not merely about speed—it is about mastering extreme physics. As research advances, it promises to redefine the limits of aerospace engineering and inspire the next generation of innovators.

Mr. Muztaba Alam
8th Sem Aeronautical Engineering

B.Tech | B.Arch | M.Tech | MBA | MCA | Polytechnic | BAMS | D.Pharm | B.Pharm | B.ScNursing | Physiotherapy

WorkShop

Two Days Hands on Workshop on Build & Fly Your Drone

Title:	Two Days Hands on Workshop on Build & Fly Your Drone
Aim:	The aim of this workshop was to provide students with **theoretical knowledge and practical exposure**to Unmanned Aerial Vehicles (UAVs), focusing on **assembly, calibration, configuration, and test flying of drones.**
Summary Paragraph:	The Department of Aeronautical Engineering, TGPCET, in association with Ozone Aviation India Pvt. Ltd. and the AeSI Student Chapter, organized a two-day hands-on workshop titled **"Build & Fly Your Drone"** on **4th and 5th September 2025** for **85 students**. The workshop was conducted by **Mr. Akash Chitmitwar**, Founder of Ozone Aviation India Pvt. Ltd., Nagpur.The program provided a balanced blend of theoretical concepts and practical training in UAV technology, covering drone components, mechanical and electronic assembly, flight controller integration, calibration, and safe flying operations. Students actively participated in hands-on drone assembly, performed pre-flight checks, and gained experience in GPS-based autonomous flying and troubleshooting. Overall, the workshop successfully enhanced students' technical skills, practical understanding, and career awareness in the rapidly growing field of drone and aviation technology.
Outcomes:	Students gained hands-on experience in assembling, configuring, and calibrating drones. Students developed a clear understanding of drone components, sub-systems, and flight controllers. Students enhanced their knowledge of aerodynamic principles and flight mechanics through practical flying sessions. Students learned pre-flight safety checks, safe flying practices, and basic troubleshooting techniques.

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" FIHAB National Level Workshop"

Title:	" FIHAB National Level Workshop"
Aim:	This **FIHAB (Flameless Indoor Hot Air Balloon) workshop** served as a valuable, hands-on experience for students, enabling them to understand the practical applications of **thermodynamics and materials science** beyond the classroom. It motivated them to upgrade their skills in **sustainable engineering design** and fabrication in line with the growing need for eco-friendly solutions.
Summary Paragraph:	The Department of Aeronautical Engineering organized a **National Level Workshop cum Competition on Flameless Indoor Hot Air Balloon (FIHAB)** on **4th and 5th October 2025** for **55 students** from engineering, diploma, and science backgrounds. The program was conducted under the expert guidance of **Dr. Rajkumar S. Pant, Associate Professor, Aeronautical Engineering, IIT Bombay**.The two-day workshop provided a strong blend of theory and hands-on practice, focusing on buoyancy, aerostatics, thermodynamics, material selection, and sustainable flameless heating systems for lighter-than-air aircraft. Students actively participated in the design, fabrication, testing, and competitive flying of indoor hot air balloons, enabling them to apply classroom concepts to real-world engineering challenges. Overall, the workshop enhanced students' technical competence, innovation skills, teamwork, and awareness of sustainable and emerging technologies in the field of lighter-than-air aviation.
Outcomes:	• Students gained practical understanding of buoyancy, aerostatics, and thermodynamics through hands-on design and flying of flameless indoor hot air balloons. • Students successfully correlated theoretical knowledge of physics, fluid dynamics, and materials science with real-time engineering applications. • Students developed skills in material selection, fabrication, joining techniques, and lightweight structural design.

" National Conference Participation"

Name	date	Paper Title
Prof. Vishwjeet Ambade	12th Nov to 14th Nov	Assessment of Mechanical Properties of Paraffin Wax for Hybrid Rocket Fuel
Prof. Mayuri Wandhare		
Prof. Himani Harpal Kumar		

Lokmanya Tilak Jankalyan Shikshan Sanstha's
PRIYADARSHINI COLLEGE OF ENGINEERING ,
NAGPUR (MAHARASHTRA)
(An Autonomous Institution) affiliated to RTMNU
NAAC Accredited with A+ Grade
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AICTE ATAL-VAANI Sponsored National Conference

on

"Bharat's Leap in Space & Defense: Atmanirbharta to Global Leadership"
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Organized by
DEPARTMENT OF AERONAUTICAL ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to certify that Prof. Vishwjeet Ambade of Tulsiramji Gaikwad -Patil College of Engineering & Technology, Nagpur has presented a paper titled "Assessment of Mechanical Properties of Paraffin Wax for Hybrid Rocket Fuel" in the AICTE ATAL-VAANI National Conference - 2025 held from 12th to 14th November 2025 at Priyadarshini College of Engineering, Nagpur

Dr. V. Kaushik
Co - Convenor

Dr. C. N. Sakhale
Head of Department &
Convenor

Dr. G. M. Asutkar
Vice - Principal
PCE Nagpur

Dr. S. A. Dhale
Principal
PCE Nagpur

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This is to certify that *Prof. Himani Harpal* of *Tulsiramji Gaikwad - Patil College of Engineering & Technology, Nagpur* has presented a paper titled *"Assessment of Mechanical Properties of Paraffin Wax for Hybrid Rocket Fuel"* in the AICTE ATAL-VAANI National Conference - 2025 held from 12th to 14th November 2025 at Priyadarshini College of Engineering, Nagpur

Dr. V. Kaushik	Dr. C. N. Sakhale	Dr. G. M. Asutkar	Dr. S. A. Dhale
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Message from the Editorial Team

As we turn the final page of this edition, we reflect on the passion, creativity, and teamwork that brought it to life. This magazine is more than just words and pictures—it's a mirror of our department's spirit, achievements, and dreams.

To all readers: thank you for being a part of this journey. May these pages inspire, inform, and ignite new ideas.

Until next time, keep aiming high and flying higher.

— Editorial Team, Aeronautical Engineering Department

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