

NEWS LETTER

JULY - DEC 2024



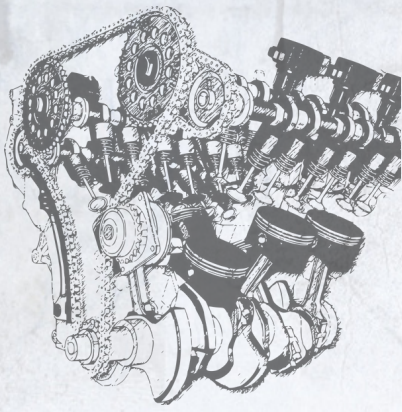


Table Of Content

Vision and Mission	01
From the HOD's Desk	02
VGEC Rocketry Team 2024	03
Faculty Achievement	04
Student Achievement	05
Departmental Activities	06
Faculty Development & Training	07
Research, Projects & Academic Contributions	08
Young mind	09
Looking Ahead – Upcoming Initiatives	11
Closing Message	12

VISION AND MISSION



VISION

To create an excellent environment for quality base education in the field of Mechanical Engineering for preparing socially responsible technocrats and entrepreneurs.



MISSION

- Impart quality education and enhance the creative and innovative skills to nurture globally acceptable mechanical engineer.
- Provide state-of-the-art laboratories and teaching-learning environment through qualified faculties.
- Develop linkage with Industry for excellence in research and consultancy services.
- Encourage life-long learning, ethical values and entrepreneurship culture for industrial and societal needs.

PEO's and PSO's of Department

Program Educational Objectives (PEOs)

- Apply core subject knowledge to various challenging problems.
- Adopt technical skills and leadership capability to explore the problems and present the solutions with professional ethics.
- Plan and manage the production of components as per needs of the society.
- Utilize engineering software and experimental capabilities to pursue research, higher education and entrepreneurship.

Program Specific Outcome (PSOs)

- Graduates will be able to apply technical knowledge to identify, formulate and solve Mechanical Engineering problems relating to thermodynamics, fluid sciences, materials science, design and dynamics and industrial management.
- Graduates will utilize their skills to solve industrial and R&D problems using modern engineering tools, latest software and equipment for environment friendly solution.
- Graduates will be able to pursue their career as professional entrepreneur



FROM THE HOD'S DESK

The second half of 2024 was defined by our deep commitment to strengthening the bridge between academic theory and industrial practice, a core objective of our technical education philosophy. The cornerstone of this effort was the two-week industrial training undertaken by a majority of our faculty during July and August. This invaluable experience has equipped our educators with the latest industry insights, ensuring our students receive an education that is both current and relevant to real-world challenges.

In alignment with the education policies of the Government of Gujarat, the department has actively encouraged innovation, research, and holistic student development. I am particularly proud to share that two SSIP projects, including the "Ambulance Relief from Traffic Signal System" and "Bearing Radial Clearance Measuring Instrument," have been approved under the mentorship of our faculty, reflecting our students' innovative spirit.

Our faculty have also made notable contributions through research publications in referred journals, technical workshops, and participation in faculty development programs (FDPs).

I extend my heartfelt gratitude to our industry and academic partners for their crucial support. Building on this momentum, our goal for the upcoming year is to leverage these enhanced industry connections to secure more internships, collaborative projects, and live problem-solving opportunities for our students, ensuring they are not just graduates, but industry-ready professionals.

Dr. P K Brahmhatt



VGEC Rocketry Team 2024

VISION

Our vision is to revolutionize rocketry through innovation and teamwork. We aim to break barriers and reach new heights, setting new standards in the field.

MISSION

To become the center of aerospace learning and passion where students can come to get core hands on learning experience.

To become a name in Indian amateur rocketry circles where we are referred to as pioneers of the industry in India.

TEKNOFEST ROCKET COMPETITION 2024

NOSE CONE

Shape: Ogive, optimized for supersonic flight (Mach1+).
Material: Carbon fiber body for lightness; Aluminium 7075 tip for heat resistance. Eyebolt: Forged steel (as per rules).

FIN DESIGN

Freeform fins for stability and reduced drag. High sweep angle for smoother airflow. Designed to lower center of pressure below center of mass. 2 mm thick fins reinforced with tip-to-tip bonding.

FLIGHT CONTROL COMPUTERS Commercial FCC RRC3 "Sport" Altimeter, dual deployment, barometric sensor. 15-flight data storage. Indigenous FCC ESP8266+ BMP280 + IMUs (MPU6050, ADXL345) Kalman filter for accurate data fusion. Manages separation, drogue & main deployment Data logging + Wi-Fi communication (ESP-NOW).

RECOVERY - PARACHUTES

Primary: Cross type, 25 m/s descent, low wind drift.
Secondary & Payload: Ellipsoidal, reduce descent to 7 m/s. Material: Ripstop nylon, braided nylon ropes, nylon shock cords. Connectors: Carabiners, swivels, forged steel eyebolts. Colors: Primary - Purple; Secondary - Olive Green & Orange; Payload-Olive Green & Purple.

AIR FRAME

Length: 1.9 m | ID: 77 mm | OD: 82 mm
Material: Fiberglass-Epoxy composite.
Single-body design for simplicity and reliability

RECOVERY SYSTEM - SEPARATION

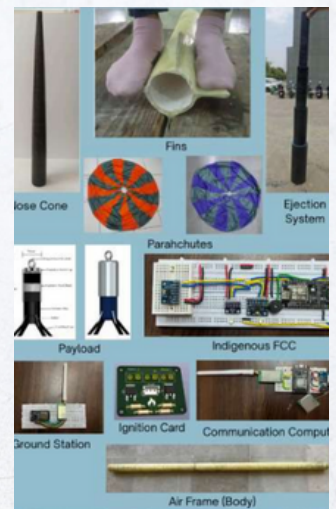
Telescopic cylinder spring mechanism (no hot gas) Four concentric cylinders compress into each other. Spring inside innermost cylinder held by nylon string. Spring releases → cylinders extend → parachute deploys.

GROUND STATION

LoRa EBYTE E-32 900T30D module @ 868 MHz 30 dB power. Ensures reliable long-range rocket-ground link. Both ends use ESP-32 microcontrollers with matched configs. Ground station antenna receives GPS + flight data in single packet. Data processed into structured 78-byte format

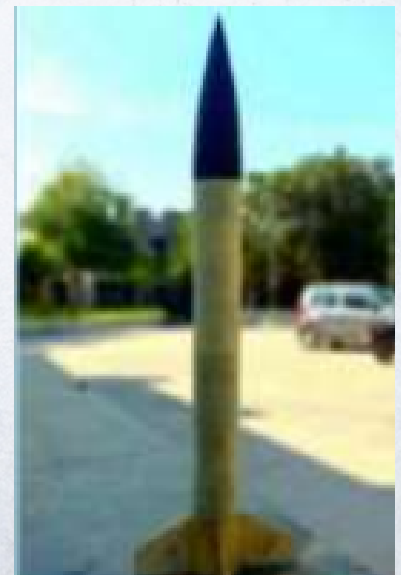
PAYLOAD

Stabilization: Single-axis reaction wheel Sensors: MPU6050 BMP280, DHT11, GPS NEO6M
Communication: LoRa antenna (E32 900T30D). Processor: ESP32 for control & data logging.



PROJECT AFLATOON

Aflatoon, our second rocket, was developed almost entirely in-house with the goal of reaching 1 km altitude using an I-class motor. Its body combines fiberglass and carbon fiber, with a fiberglass nose cone, aluminum avionics bay, and fiberglass fins. Across multiple test flights, the team refined propulsion and recovery systems, overcoming motor underperformance, parachute failures, and manufacturing challenges. On 8th March 2024, Aflatoon had its first launch, returning in three pieces but providing critical data. By 13th October 2024, it achieved its highest altitude of 702 m at 175 m/s, marking a major milestone. The project also introduced our SNS flight computers, from V1 prototypes to SNS V3 aimed at commercialization.



Faculty Achievement

SSIP project approved under mentorship of following faculties

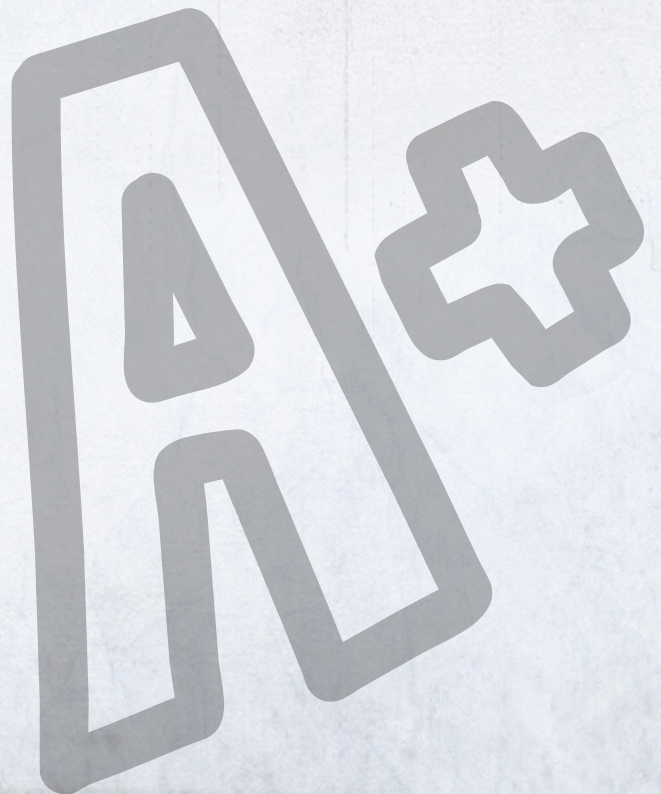
Sr. No.	Title of PoC	Name of Faculty Mentor(s)
1	Ambulance Relief from Traffic Signal System	Prof. V K Patel
2	Bearing Radial Clearance Measuring Instrument	Prof. S A Pawar



Student Achievement

Kurukkanpotta Divya Vasuprasad stood third in Sinhnaad competition organised by ignited youth forum

Hadiya Nikunj Pravinbhai participated in Lakshya 2023 national level edutech fest organised by team Robocon LDCE Ahmedabad and secured first position in Cat a Pult competition



SEM 5 STUDENTS

TEAM 1

- RATHOD NIDHI BHARATBHAI
- SIDHWANI RANJAN
- MULANI AYUSH

**FUND OF ₹31,000 APPORVOED FOR THE
PROJECT AMBULANCE RELIEF FROM TRAFFIC
SIGNAL SYSTEM UNDER SSIP 2.0**

TEAM 2

- KAVA KARAN J.
- PARMAR RUSHABH R.
- SANKHAT MAHESH

**FUND OF ₹1,69,000 APPROVED FOR THE
PROJECT BEARING RADIAL CLEARANCE
MEASURING INSTRUMENT UNDER SSIP 2.0**



Industrial visit to a GSRTC Central Workshop

The Department organized an industrial visit to the GSRTC Central Workshop, Naroda, on 16th September 2024. A group of 25 students, guided by Prof. S. A. Pawar, got an exclusive look behind the scenes at the workshop. This visit served as a practical journey into the world of public transport vehicle maintenance, turning textbook concepts into real-world insights. By witnessing large-scale operations firsthand, students specializing in mechanical and automobile engineering gained a deeper appreciation for the critical work that ensures our transport sector remains safe, reliable, and efficient.

During the visit, students observed the complete vehicle maintenance workflow, from disassembly to reassembly, and learned about the real-world applications of classroom concepts in engines, chassis, and transmission systems. They also gained knowledge of both preventive and corrective maintenance strategies for public transport vehicles. The visit highlighted the importance of industrial visits as an essential part of engineering education, bridging the gap between theory and practice. As shared by the expert guide, “Behind every smooth ride on public transport is the hard work of mechanics, ensuring safety and reliability through meticulous maintenance.” – Ms. Sandhu



Faculty Development & Training

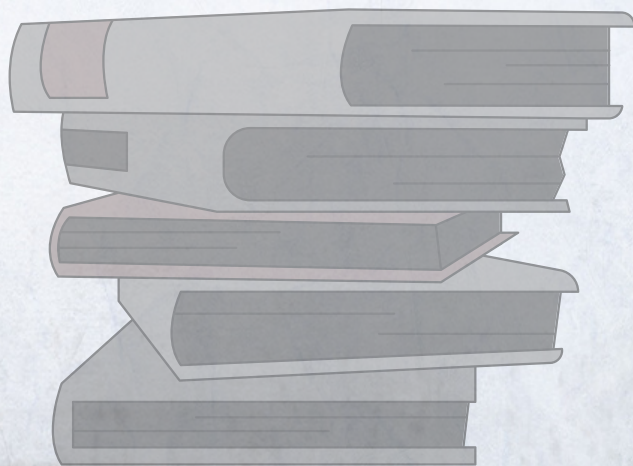
Faculty from the Department participated in hands-on industry attachments at several companies. The goal was to close the divide between theoretical classroom knowledge and practical industry standards.



Work-based learning is the key component for converting academic concepts into useful, real-world proficiencies. It ensures our instructors maintain up-to-date knowledge of current technology, which in turn equips our students with the essential practical skills and insights required by modern, fast-paced industries.

FACULTY DEVELOPMENT PROGRAMME

sr no.	FDP (Faculty Development Programme) attended
1.	Prof. D S Mehta attended eight week online training on Foundation of Computational Fluid Dynamics during Jul-Sept 2024 at NPTEL, MOOC (IIT, Madras).
2.	Prof. K P Prajapati, Prof. S A Pawar, Prof. S S Patel, Prof. J M Joshi, Prof. M N Parmar, Prof. V K Patel, Prof. A A Pujara, Prof. M M Modan, Prof. K I Dodiya, Prof. S B Pipaliya, Prof. S A Solanki and Prof. T Y Rathod attended two-week industrial training during July- August 2024 at various Industries.
3.	Prof. D S Mehta attended one week training on Train the Trainer Programme on Effective Implementation of NEP 2020 in Technical & Professional Institutes of Gujarat during 10-14 October 2024 at CTE, Gandhinagar & NITTTR Chandigarh.
4.	Prof. M I Vyas attended one week training on Nurturing Future Leadership Programme during 21-25 October 2024 at IIM, Kashipur.



Research, Projects & Academic Contributions

Sr. No.	Name of Faculty	Title of Paper/Title of Book/Book Chapter (with ISSN/ISBN)	Journal Name/Book Publisher
1	V.K.Patel	Assessing the Impact of Industrial IoT on Engineering and Manufacturing: Benefits and Challenges ISSN:2147-6799	Journal: International Journal of Intelligent Systems and Applications in Engineering (IJISAE) Vol. 12, Issue 1, pp. 523-533, 2024
2.	V.K.Patel	“Innovations in Lightweight Materials for Automotive Engineering” ISSN:- 1112 5209	Journal: Journal of Electrical Systems Vol. 20, Issue 1, pp. 110-121, 2024
3.	V.K.Patel	Fluid Dynamics in Turbomachinery Optimization Techniques and Performance Analysis ISSN:2147-6799	Journal: International Journal of Intelligent Systems and Applications in Engineering (IJISAE) Vol. 12, Issue 1s, pp. 297-306, 2024
4.	S A Solanki	A comparative study of friction stir welding and friction stir scribe technique for dissimilar metal joining ISSN 2631-8695	Journal: Engineering Research Express (IOP Publishing) Vol. 4, Issue 4, 045022, 2024
5.	R P Vyasa	Investigation on Multi-Objective Optimization of Machining Parameters and prediction for EN sereis Materials eISSN1792-8036	Journal: Engineering, Technology &Applied Science Research Vol. 14, Issue 5, pp. 10103-10109, 2024
6.	A A Pujara, M MModan	Assessment of Sustainable Manufacturing Enablers: Pythagorean Fuzzy AHP Approach ISSN: 2348-8360	Journal: SSRG International Journal of Mechanical Engineering Vol. 11, Issue 11, 2024

Young Mind

Dhairya Rajdev (Sem VII)

Being a part of the **VGEC Rocketry Team** has been a transformative experience, but the visit to ISRO truly cemented my purpose. Before joining the team, my interest in space was largely theoretical—I'd read about missions and technologies in books and online. Being a member changed that. It taught me the discipline of working towards a tangible goal, the importance of collaborating with a diverse group of minds, and the resilience needed to overcome complex technical challenges.

The visit to the Space Applications Centre, however, was on another level. It wasn't just about seeing the hardware; it was about understanding the human element behind it. Meeting Dr. Nilesh Desai was the most defining moment. His humility and unwavering passion for India's space journey made a profound impression on my young mind. It shifted my perspective from merely wanting to build rockets to aspiring to contribute meaningfully to a national mission. This experience has given my passion a new direction, turning my abstract dreams into a focused, purposeful approach to my academic and professional life. I now see myself not just as an engineering student, but as a future contributor to a legacy of innovation.

Looking Ahead – Upcoming Initiatives

For the upcoming quarter, the Department plans to:

Organize industrial visits for hands-on exposure.

Encourage students for appearing GATE examination

Conduct skill-based workshops & training programs.

Closing Message

The Mechanical Engineering Department at VGEC continues to move forward with a clear vision – to nurture engineers who are innovative, industry-ready, and research-oriented. Through faculty development, student achievements, industrial collaborations, and research excellence, the department remains committed to building a future-ready generation of mechanical engineers.

“Innovation distinguishes leaders from followers, and teamwork turns ideas into reality.”

Faculty Coordinator

Prof. Viral A. Thakar
Prof. Swapna A. Pawar

Student Coordinator

Bhavadip Vagh
220170119104

Student

Tirth Makwana
Shwetanshu Shah

Arpit Ashok Bendre
Nisarg Islaniya

Vansh KO Patel
Hariom Raval