

GOVERNMENT ENGINEERING COLLEGE PATAN
MECHANICAL ENGINEERING DEPARTMENT
NEWSLETTER

TORQUE-TALK

JULY-DEC 2023



Editor Team:

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MESSAGE FROM THE HEAD OF DEPARTMENT

Prof. Dr. A B Dhruv

Head of Department
Mechanical Engineering

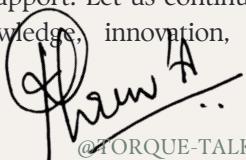


Warm greetings to all.

It is a privilege to address you through this edition of the Mechanical Engineering Department newsletter. Our department continues to foster a culture of learning, innovation, and continuous improvement, aiming to prepare students for the evolving challenges of modern engineering and industry.

Along with academic excellence, we emphasize practical exposure, research activities, and skill development to ensure the holistic growth of our students. The achievements and activities highlighted in this newsletter reflect the dedication, teamwork, and enthusiasm of our faculty and students.

I sincerely appreciate the efforts of everyone who contributes to the progress of the department and thank all stakeholders for their valuable support. Let us continue to work together in creating a future driven by knowledge, innovation, and professionalism.



GOVERNMENT ENGINEERING COLLEGE PATAN

ABOUT THE INSTITUTE



What we are...

Government Engineering College, Patan was established in April 2004 with three branches: Computer Engineering, Electronics and Communication Engineering, and Mechanical Engineering each with intake of 60 totaling to 180. The institute was initially functioning in the premises of the K. D. Polytechnic, Patan temporarily. It was shifted to its own newly built-up green premise in August 2008 at Katpur village on Chanasma- Patan road 8 kms before Patan.

Two more branches of Electrical Engineering and Civil Engineering each with intake of 60 were introduced from June- 2009. The intake of Electronics and communication was reduced to 30 and Mechanical Engineering was reduced to 90 from 2020. Currently institute have total intake 330. Each department has well established laboratories, computer centers and well qualified staff.

VISION

To prepare Human Resources with value based competency for technical advancements and growth of society.

MISSION

- To deliver technical programs and services to cater the current needs of society and industry.
- Helping industries in solving challenges by means of providing best technical human resources.
- To contribute in sustainable growth of society.

MECHANICAL ENGINEERING DEPARTMENT

ABOUT THE DEPARTMENT



Our strong academic performance in high school enables you to pursue a range of educational opportunities. One avenue you'll want to explore is mechanical engineering. Studying mechanical engineering at Government Engineering College Patan will equip you with a broad education, preparing you for a variety of career paths graduation and providing a solid foundation for continuing education. Mechanical engineering encompasses many areas. In short, anything that involves the design and or manufacturing of mechanical, thermal or electronic devices and or processes falls entrepreneurs, chief engineers, astronauts, faculty, physicians and patent attorneys, among other occupations. The field includes activities such as designing, developing, manufacturing, managing, researching and controlling engineering systems and their components.

VISION

To create a centre of excellence for imparting education in mechanical engineering field to meet the current and future challenges of technological and sustainable development.”

MISSION

- To build enabling environment for excellent teaching, learning and research in order to produce entrepreneurs and innovators in the field of Mechanical Engineering for sustainable improvement.
- To impart adequate fundamental knowledge, technical and soft skills to students.
- To develop Mechanical Engineering solutions for the problems of industry and society.

MECHANICAL ENGINEERING DEPARTMENT

Programme Educational Objectives (PEOs)

1. To prepare graduates with a technical knowledge of mathematical, scientific, engineering, technology, management, humanities and various other interdisciplinary subjects for a successful career.
2. Graduates will apply the knowledge of Mechanical Engineering to solve real Engineering problems for sustainable development.
3. To inculcate graduates with leadership skills with high level of integrity, Professional personality and ethical values.
4. To equip graduates with modern tools, technology and advanced software's for deliberating engineering solutions.

Programme Specific Outcomes (PSOs)

- PSO1: Apply the advanced software skills to model, simulate, analyze and optimize Mechanical systems and Processes.
- PSO2: Acquire technical and managerial skills for innovative activities.

DEPARTMENT

SPOTLIGHT



"Quint Cargo", A Team from 7th Semester Mechanical Department from Government Engineering College, Patan, was selected by All India Council of Technical Education (AICTE) for National Level 'Bharat Cycle Design Challenge 2023' organized by 'Namma Nimma Cycle Foundation'. From total of 700 entries 16 Teams were shortlisted in different category Like Cargo Cycle, Cargo EV, Commute Cycle, Commute EV. Team was shortlisted under Cargo EV. AICTE provided 40,000 Rupees as Seed fund to prepare prototype. Team successfully completed a prototype and on 4th November team participated for exhibition in Bangalore' Chanakya University. AICTE Chairman Prof. T.G Sitharam were also present at exhibition. Only team selected from Gujarat, Proud moment for Patan.



Patel Anshkumar Nileshbhai 7th Mechanical
210220119503 take partipacpre in Technical/
SSIP/Smart India Hackathon based on online quiz
that is based on Blender software by Spoken Tutorial
IIT Bombay.

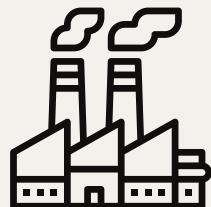
Suthar Karan Ashivnbhai 5th Sem Mechanicla had participated in SSpace Tech Quiz 3.0 conducted by Omspace Rocket and Exploration Pvt. Ltd. on 10th September, 2023

Patel Anshkumar Nileshbhai participated Quiz on online mode on 11th August, 2023 based on a software by spoken tutorial from IIT Bombay.

Chaudhari Kushkumar Prahladbhai successfully completed Qcad test organized at Government Engineering College Patan and get 52& on dated 10th August 2023

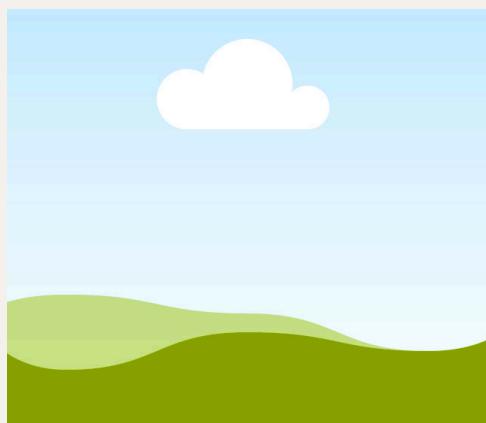
DEPARTMENT

INDUSTRIAL VISIT



On 25th August 2023, 40 Semester 7 students visited the Automation CoE (Bosch Rexroth) at Ganpat University. This center simulates smart factory environments with PLCs, robotics, and pneumatic systems. Students worked on real-time automation simulations and saw industrial robots in action. The visit enhanced their understanding of Automated Manufacturing through Industry 4.0 tools. It inspired many to consider automation as a future specialization. The visit was guided by Dr. N. A. Patel and Prof. D. K. Patel.

The same day, students visited the Additive Manufacturing CoE at Ganpat University. They explored metal and polymer 3D printing, SLA and FDM technologies, and product prototyping. Experts explained the advantages of additive manufacturing over conventional subtractive processes. Students also saw CAD-to-part workflows and simulation software in use. It gave a futuristic perspective to modern manufacturing. 40 students participated with Dr. N. A. Patel and Prof. D. K. Patel.



Also on 25th August 2023, 40 students visited Japan India Institute of Manufacturing (JIM) – Maruti Suzuki. This world-class training center integrates Japanese work ethics, assembly line standards, and safety protocols. Students witnessed lean manufacturing techniques like 5S, Kaizen, and TPM in action. They walked through actual car body assembly stations and saw engine part installations. The visit broadened their industrial and cultural understanding. The faculty coordinators were Dr. N. A. Patel and Prof. D. K. Patel.



On 16th September 2023, 20 Semester 5 students visited Asahi India Glass Ltd., Chansama, a key supplier of automotive and architectural glass. They studied the processes of melting, floating, cutting, and tempering of glass. Students observed automated conveyor belts, robotic handlers, and defect detection systems. They also learned how thermal stress is controlled during cooling. It provided a deep understanding of fragile material handling. The visit was guided by Dr. N. A. Patel and Prof. D. K. Patel.

On 30th September 2023, 18 students of Semester 3 visited Marshal Thresher for a foundation-level industrial introduction. They were introduced to basic workshop layouts, raw material storage, and safety procedures. The visit was meant to help them observe real machines and processes for the first time. Engineers explained the importance of quality control even in small-scale manufacturing. It sparked early technical curiosity among freshers. The coordinator was Dr. N. A. Patel.



On 13th October 2023, a large-scale visit to PDEU Laboratories and Center of Excellence was conducted for students of Semesters 3, 5, and 7, involving 105 students. The labs covered heat engines, hydraulics, instrumentation, and CNC machining. Students participated in experiments and learned how theories are validated with real results. The session included demos on solar heating systems, steam turbines, and vibration measurement. It served as a valuable academic enrichment experience. The faculty team included Dr. A. B. Dhruv, Prof. B. B. Patel, Prof. V. K. Patel, and Prof. R. A. Oza.



On 1st November 2023, 41 students of Semester 7 visited the Thermal Power Station, Gandhinagar. The visit included walkthroughs of the boiler section, turbine hall, cooling towers, and control room. Engineers explained power plant cycles, load control, and boiler efficiency strategies. The role of automation and safety in energy generation was emphasized. The visit aligned closely with the PPE syllabus and broadened students' real-world perspectives. The faculty coordinator was Dr. H. R. Prajapati.

STUDENT



PARTICIPATION

- Aryan Singh (Enrollment No. 240220119001) participated in the Quiz on Life Style of Environment, which was conducted online on 15/11/2023.
- Sodha Amitkumar Babldevbhai (Enrollment No. 240220119024) participated in the Quiz on Life Style of Environment, conducted online on 15/11/2023.
- Prajapati Nikulkumar Harchandbhai (Enrollment No. 240220119018) participated in the Quiz on Life Style of Environment, which was held online on 15/11/2023.
- Omkumar Nareshbhai Hingu (Enrollment No. 220223119005) successfully completed QCad Training, conducted online by IIT Bombay on 10/08/2023.
- Chauhan Rajdipsinh Mukeshsinh (Enrollment No. 220223119002) participated in an Online Quiz on WhatsApp Security, conducted online under MeitY, on 02/08/2023.
- Chauhan Rajdipsinh Mukeshsinh (Enrollment No. 220223119002) attended a program on Fundamental Knowledge of E-Commerce, held at E-mpi B School, on 27/08/2023.
- Ayush Rajput (Enrollment No. 210220119534) won the Bronze Medal in Best Physique – Zonal Level on 22/08/2023.
- Aditya Pravinbhai Patel (Enrollment No. 210220119047) participated in the West Zone All India University Kabaddi Competition, which was held at D. A. University, Indore, from 04/11/2023 to 08/11/2023.

DEPARTMENT

RESEARCH AND PUBLICATIONS



Name of Faculty	Title of Research Paper	Type of Publication
Hitesh Panchal	Zero emission /energy building heating through parabolic dish collector focused KNO ₃ -NaNO ₃ and KNO ₃ -NaNO ₃ -NaNO ₂ PCM absorber: A case study	Scopus & WoS publication
Hitesh Panchal	A case study on analyzing the performance of microplate heat exchanger using nanofluids at different flow rates and temperatures	Scopus & WoS publication
Hitesh Panchal	A review on PCM and nanofluid for various productivity enhancement methods for double slope solar still: Future challenge and current water issues	Scopus & WoS publication
Hitesh Panchal	Numerical simulation of heat transfer characteristics of circular cylinder forced to oscillate elliptically in an incompressible fluid flow	Scopus & WoS publication
Hitesh Panchal	Fe ₃ O ₄ -multiwalled carbon nanotubes-bentonite as adsorbent for removal of methylene blue from aqueous solutions	Scopus & WoS publication
Hitesh Panchal	Analysis of vibrations in a diesel engine produced by Jatropha biodiesel using heterogeneous catalyst	Scopus & WoS publication
Hitesh Panchal	Numerical and experimental investigation of the influence of various metal-oxide-based nanoparticles on performance, combustion, and emissions of Cl _{andina} fuelled with tamarind seed oil methyl ester	Scopus & WoS publication
Hitesh Panchal	Performance of SCARA based intelligent 3 axis robotic soft gripper for enhanced material handling	Scopus & WoS publication
Hitesh Panchal	Investigation on solar still with integration of solar cooker to enhance productivity: Experimental, exergy, and economic analysis	Scopus & WoS publication
Hitesh Panchal	A novel multi objective constraints based industrial gripper design with optimized stiffness for object grasping	Scopus & WoS publication
Hitesh Panchal	On Minimizing TCP Traffic Congestion in Vehicular Internet of Things (VIoT)	Scopus & WoS publication
Hitesh Panchal	Mathematical modelling and verification of open sun drying of cotton seeds	Scopus & WoS publication
Hitesh Panchal	Efficacious elimination of salts from a convoluted ethylene glycol-water solution employing nanofiltration membranes	Scopus & WoS publication

Name of Faculty	Title of Research Paper	Type of Publication
Hitesh Panchal	Servomotor Pitching Control Method for H-Type Darrieus Turbine	Scopus & WoS publication
Hitesh Panchal	A case study on the design and development of solar food cooking system with a PCM as a heat storage unit	Scopus & WoS publication
Hitesh Panchal	Experimental study on effect of temperature and equivalence ratio on biomass syngas generation for fluidized bed gasifier techniques	Scopus & WoS publication
Hitesh Panchal	A novel single phase grid connected solar photovoltaic system for state of charge estimation using recurrent neural networks	Scopus & WoS publication
Hitesh Panchal	Ultrasonically synthesized MgZnO nanoparticles for enhanced piezo-photocatalysis and MgZnO/p-Si heterojunction diode characteristics	Scopus & WoS publication
Hitesh Panchal	Efficient Battery Models for Performance Studies-Lithium Ion and Nickel Metal Hydride Battery	Scopus & WoS publication
Hitesh Panchal	An optimal selection of slot/pole combination and its influence on energy efficient PMSM for submersible water pumping applications	Scopus Indexed publications
Hitesh Panchal	A deep transfer learning-based convolution neural network model for COVID-19 detection using computed tomography scan images for medical applications	Scopus & WoS publication
Hitesh Panchal	SARS-CoV-2 removal by mix matrix membrane: A novel application of artificial neural network based simulation in MATLAB for evaluating wastewater reuse risks	Scopus & WoS publication
Hitesh Panchal	Thermodynamic modeling and multi-objective optimization of a solar-driven multi-generation system producing power and water	Scopus & WoS publication
Hitesh Panchal	Performance evaluation of using evacuated tubes solar collector, perforated fins, and pebbles in a solar still – experimental study and CO ₂ mitigation analysis	Scopus Indexed publications
Hitesh Panchal	Performance investigation of 140 kW grid connected solar PV system installed in southern region of India–A detailed case study and analysis	Scopus & WoS publication
Hitesh Panchal	Exergy assessment of an Organic Rankine Cycle for waste heat recovery from a refrigeration system: a review	Scopus & WoS publication
Hitesh Panchal	A simplified methodology for mitigating the harmonics and common-mode voltage using multi-level inverters for renewable energy applications	Scopus & WoS publication
Hitesh Panchal	Experimental and numerical analysis of heat transfer and fluid flow characteristics inside pulsating heat pipe	Scopus & WoS publication

FACULTY AND STAFF



Dr. Anand Dhruv

Designation : Professor
Qualification : Ph. D
Experience : 33 Years
Area of Interest : CAD-CAM, Metal Forming, Automobile Engg, Manufacturing Engg
Email : anand.dhruv@gecpatan.ac.in



Dr. Dineshkumar Patel

Designation : Professor
Qualification : Ph. D
Experience : 32 Years
Area of Interest : Solar Energy
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Prof. Dipak Parmar

Designation : Assistant Professor
Qualification : M.Tech (I.C. & Automobile)
Experience : 17 Years
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Prof. Chiragkumar C. Patel

Designation : Assistant Professor
Qualification : M.Tech.
Experience : 17 Years
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Dr. Miteshkumar Govindbhai Patel

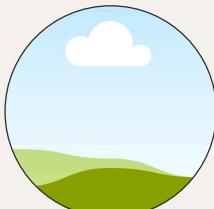
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FACULTY AND STAFF



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Dr. Kaushikkumar V. Patel

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Area of Interest : Machine Design
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Prof. Kamlesh Hasmukhlal Thakkar

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Prof. Bhargavkumar Patel

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FACULTY AND STAFF



Prof. Vipulkumar Kashirambhai Patel

Designation : Assistant Professor

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Prof. Narendrasinh Ramjibhai Makvana

Designation : Assistant Professor

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Experience : 12 years

Area of Interest : IC/Auto

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Dr. Hitesh Panchal

Designation : Assistant Professor

Qualification : Ph. D

Experience : 12 years

Area of Interest : Solar Thermal, Solar Photovoltaic, IC Engine

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Prof. Rakesh A. Oza

Designation : Assistant Professor

Qualification : M. E.

Experience : 12 years

Area of Interest : CAD-CAM

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Dr. Hirenkumar Rameshbhai Prajapati

Designation : Associate Professor

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Experience : 12 Years

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FACULTY AND STAFF



Prof. Chirag P Kadiya

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Prof. Kiran K. Rabari

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Prof. Dharmesh K. Patel

Designation : Assistant Professor
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Experience : 13 Years
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Shri. Rakesh V. Patel

Designation : Lab Assistant
Qualification : D E
Experience : 13 year



Ms. Priyanka J. Patel

Designation : Lab Assistant
Qualification : B E
Experience : 13 year

DEPARTMENT

LABORATORIES



Refrigeration and Air Conditioning Lab:

This laboratory houses the vapor compression refrigeration system, air conditioning, heat pump setup, refrigerator to determine the most crucial performance parameters of RAC devices. This lab plays a very important role to understand various refrigeration cycles used in domestic as well as Industrial purpose.



CAD/CAM Lab:

This laboratory emphasizes on computer aided design and manufacturing, quality control and measurement too. It also provides various activities in nonconventional manufacturing, flexible manufacturing system and automation. This lab is equipped with CNC turning centre, 5 axis robot and other equipment's required as per syllabus.



Heat Transfer Lab:

This lab course is primarily being offered to the III Year B.E. Mechanical Engineering Students to make them understand the principles of i.e. conduction, convection, Radiation boiling and Condensation modes of heat transfer and principles of Refrigeration and Air Conditioning. Laboratory is equipped with the set up of Pin Fin Apparatus, Heat transfer in Natural convection, Composite Wall Apparatus etc.

LABORATORIES



Workshop and Machine Shop Lab:

Workshop has various facilities like Machine shop, Carpentry shop, Fitting shop, Welding shop, Smithy shop, Plumbing shop, Foundry shop etc. to cater to hands on experience for the students. For manufacturing process, this workshop has a more no. of lathe machine, drilling machine, shaper machine, shearing machine etc.



Internal Combustion Engine Lab:

This laboratory is equipped with modern instruments like modern internal combustion engine test rig, diesel smoke meter, variable compression ratio engine test rig, five gas exhaust gas analyzers etc. In this lab, performance optimization of engine parameters like power, fuel consumption and emissions etc are being taught to the students.



Kinematics and Dynamics of machines Lab:
Students are greatly benefited by studying the demonstration of the Slider Crank Mechanism, Cam Follower Mechanism, Different Gears and Gear train Mechanism, Gyroscope etc.



Computer-Aided Design (CAD) Lab:

This lab is facilitated It is having computer systems with high-end configurations to ensure seamless performance to support students in design, simulation and analysis tools essential for modern engineering applications. The CAD Lab has 30 computers, with 12 PCs equipped with ANSYS for simulation and analysis, while all have Autodesk software for drafting and design.

LABORATORIES



Fluid Mechanics and Fluid Power Engineering Lab:

This laboratory helps students to understand the principles of fluid behavior and hydraulic machinery operations. It offers hands on experience with devices like flow meters, pumps, turbines, and hydraulic systems. Experiments cover fluid properties, flow measurement, and performance testing of machines. The lab enhances practical knowledge of theoretical fluid mechanics concepts learned in classrooms.



Automation in Manufacturing Lab:

The laboratory component of the Automation in Manufacturing course aims to provide hands-on experience with automation technologies used in manufacturing industries. Through practical experiments, students will explore industrial robotics, flexible manufacturing systems (FMS), and automation machinery. The lab exercises are designed to reinforce theoretical concepts and develop problem-solving skills for real-world automation challenges.



Basic Mechanical Engineering Lab:

The Basic Mechanical Engineering Laboratory provides practical exposure to fundamental mechanical systems and components. It includes models of boilers along with their mountings and accessories, helping students understand steam generation and safety mechanisms. The laboratory also features internal combustion (IC) engine models, including four-stroke and two-stroke petrol and diesel engines, enabling students to study engine components, working principles, and thermodynamic cycles.



Engineering Graphics & Design Lab:

Engineering Graphics & Design (EGD) is a vital subject that enables students to communicate engineering ideas, designs, and concepts in a clear and precise manner. The laboratory has several shapes of 2D & 3D models, which will be helpful in the visualization and understanding of the subject.

DEPARTMENT MAP



GROUND FLOOR

