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TULSIRAMJI GAIKWAD-PATIL
College of Engineering & Technology

Approved by AICTE, Recognized by Govt. Maharashtra & Affiliated to MSBTE, Mumbai



— POLYTECHNIC —



Department of
Electrical Engineering

NEWSLETTER

SESSION : 2024-25 (EVEN)

SPARK
2K24



GAIKWAD-PATIL
GROUP OF INSTITUTIONS

YOUR DREAM IS OUR MISSION



B.PHARM | D.PHARM | B.TECH | B.ARCH | M.TECH | MBA | MCA | BBA | BCA | POLYTECHNIC |
D.ARCH | BAMS | B.SC NURSING | PHYSIOTHERAPY | PH.D

The background of the page is a photograph of a modern building with a red and white facade, partially obscured by lush green trees and palm trees in the foreground. The right side of the page has a dark grey overlay where the title and table of contents are located.

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Vision of the Institute

To emerge as a learning Center of Excellence in the National Ethos in Diploma in Engineering.

Mission of the Institute

M1: To elevate the standards of students through ethical practices.

M2: To provide facilities and services to meet the challenges of Industry and Community.

M3: To ascertain holistic development of the students and staff members by inculcating knowledge and profession as work practices.

Vision of the Department

To Emerge as a learning Centre in the Domain of Electrical Engineering

Mission of the Department

M1: To impart quality technical education through effective teaching & learning process.

M2: To provide learning environment to face societal and industrial challenges of Electrical Engineering

M3: To ensure overall development of students and staff members by inculcating knowledge and professional ethics as a part of lifelong learning.

About TGPCET

Tulsiramji Gaikwad-Patil College of Engineering and Technology Polytechnic (TGPCET) was established in the year 2013 by Vidarbha Bahu-uddeshiyaShikshan Sanstha (VBSS), a registered society. It is a self-financed Private Engineering College, which is affiliated to Maharashtra State Board of Technical Education Mumbai 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.

About Department

The Department of Electrical 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. The specious infrastructure, well equipped laboratories, meritorious students and academically qualified and enthusiastic faculty being the salient features of the Department.

HOD's Desk



Mr. Ganesh Wakte

HOD, EE, Polytechnic

Welcome to the Department of Electrical Engineering of TulsiRamji Gaikwad-Patil College of Engineering and Technology, Polytechnic, Nagpur. We started our journey in the year of 2013. Over the last 11 years, we have grown our Expertise & competence in the core Electrical Engineering curriculum. Electrical Engineering department aims to nurture young talents with technical training to tackle real-world challenges. With a blend of experienced faculty, the department focuses on theoretical and practical approaches. The department has well-equipped laboratories and provides opportunities for collaborative growth through its technical society, "TECHNO-SPARK". The goal of this newsletter is to keep you updated with developments in Electrical Engineering Department of TGPCET Polytechnic. This department is continuously undergoing transformation. New initiatives have been launched related to academics, student affairs, extracurricular activities. The students & faculty members of the department are sincerely participating in various activities organized at institute or at other places. It is elevating to see the sound performance of students. I offer best wishes for future activities. At last, I thank to the editors of SPARK for their sincere efforts & I offer my best wishes to the readers of this newsletter.

PEO's, PSO's & PO's

Programs Educational Objectives:

PEO 1. Provide socially responsible, environment friendly solutions to Computer engineering related broad-based problems adapting professional ethics.

PEO 2. Adapt state-of-the-art Computer engineering board-based technologies to work in multi-disciplinary work environments.

PEO 3. Solve broad-based problems individually and as a team member communicating effectively in the world of work

Programs Specific Outcomes:

PSO 1. Computer Software and Hardware Usage:

Use state-of-art technologies for operation and application of computer software and hardware.

PSO 2. Computer Engineering Maintenance:

Maintain computer engineering related software and hardware system.

Programs Outcomes (PO's):

1. Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
2. Problem analysis: Identify and analyze well-defined engineering problems using codified standard methods.
3. Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
4. Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
5. Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.
6. Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
7. Life-long learning: Ability to analyze individual needs and engage in updating in the context of technological changes.

Industrial Visit



Department of **Electrical Engineering** have organized an Industrial visit at Solar Power Plant 33/11 KV substation, Butibori, Nagpur, Maharashtra

Aim: To enhance students' practical understanding of power generation and distribution through an industrial visit to the Solar Power Plant and 33/11 KV Substation, Butibori.

Department of Electrical Engineering of Tulsiramji Gaikwad Patil College of Engineering & Technology, Polytechnic, Nagpur student visited "Solar Power Plant 33/11 KV substation, Butibori, Nagpur". Students have got opportunity to interact with the "On Field Engineers" and different sections of Minus Agro Agency plant and they got the platform of industrial exposure with help of which they get aware about the latest tools and technology used in the industry.

Industrial Visit



Department of **Electrical Engineering** have organized an Industrial visit at 3X660 mw koradi thermal power station, koradi, Nagpur, Maharashtra

Aim: To provide students with practical insights into large-scale power generation and operation processes at the 3x660 MW Koradi Thermal Power Station, Koradi.

Department of Electrical Engineering of Tulsiramji Gaikwad Patil College of Engineering & Technology, Polytechnic, Nagpur student visited "3X660 mw koradi thermal power station, Koradi, Nagpur". Students explored the working of large-scale thermal power systems, automation, and high-volume electricity generation, gaining practical insights aligned with their academic curriculum. The visit included a guided tour, expert interactions, and a Q&A session led by Ms. Manisha Zade, Assistant Engineer, MSPGCL.

Guest Lecture



Aim: To enhance students' understanding of transformer working principles and maintenance practices through expert insights and practical knowledge.

An expert lecture on “Transformer Working and Maintenance” by Mr. Hemant Mathpati, Assistant Engineer, MSDCL Akot, focused on the role of transformers in power distribution and the importance of preventive maintenance for efficient and reliable operation.



Aim: To familiarize students with CAD simulation tools and their applications in engineering design, analysis, and digital modeling.

On 18th February 2025, the Department of Electrical Engineering organized an expert lecture on “Use of CAD Simulation Software” by Mr. Deepak Gajbhar from Admire Tech Vision LLP, Nagpur. The session introduced students to CAD tools like SolidWorks, ANSYS, and Simulink, enhancing their design and simulation skills aligned with PO2, PO3, PO4, PO6, and PO7.

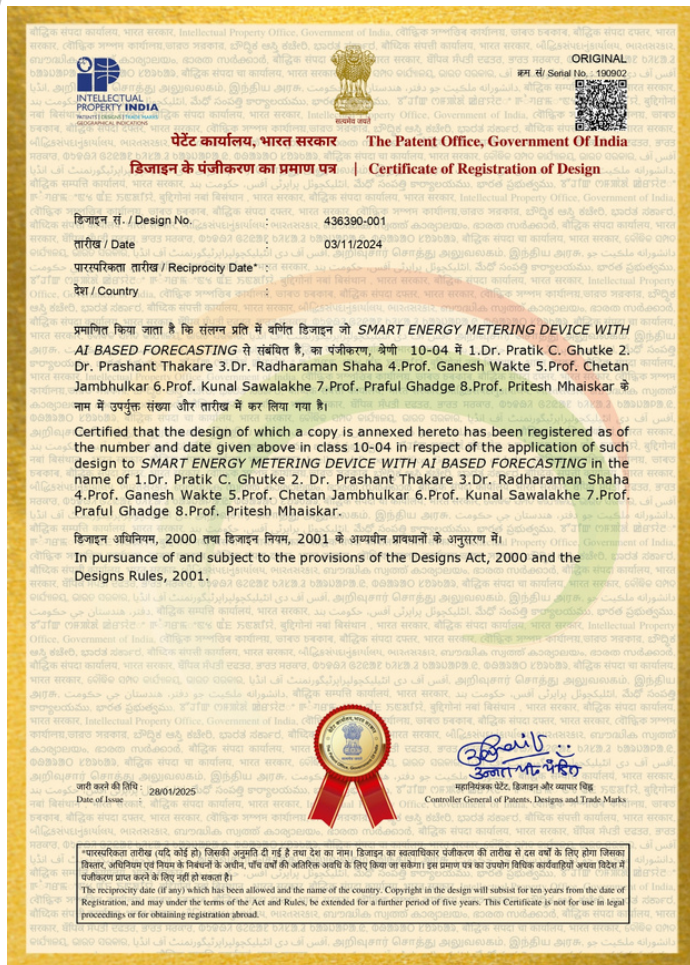
NSS Activity Conducted

HEALTH CHECKUP CAMP



National Service Scheme (NSS) Unit and TGPCET Polytechnic conducted "Health Checkup Camp" in association with Ayush Blood Centre and CARE Hospital, Nagpur on 15th February, 2025 at Kirloskar Seminar Hall, TGPCET. It's main aim is to develop a sense of social responsibility and contribute to the overall development of society. NSS encourages students to take part in community service, focusing on selfless service to the nation and its people. Its objectives was to encourage student involvement in social and community-based activities.

Faculty Achievements



Patent Granted by Government of India

“SMART ENERGY METERING DEVICE WITH AI BASED FORECASTING”, granted by the Patent Office, Government of India (Design No. 436390-001). This achievement highlights their innovative contribution towards advancing smart and sustainable energy solutions.

Core

Advanced safety system:

GAS/SMOKE LEAKAGE DETECTOR & CONTROL WITH COOLING FAN

Gas/Smoke Leakage Detector & Control with Cooling Fan

Key Features of the System:

- Real-Time Detection – Continuously monitors the environment for gas and smoke leaks.
- Automated Control System – Triggers safety mechanisms to prevent accidents.
- Alarm & Notification System – Alerts occupants immediately in case of leakage.
- Energy-Efficient Design – Operates with minimal power consumption.
- Compact & Scalable – Easily installed in homes, commercial spaces, and industries.

Benefits of the Innovation:

- Enhanced Safety – Minimizes the chances of fire outbreaks and toxic gas exposure.
- Automated Ventilation – Activates a cooling fan to dissipate harmful gases, ensuring air quality.
- Cost-Effective Solution – Affordable, easy to install, and requires minimal maintenance.
- IoT Integration Potential – Can be integrated with smart home and industrial automation systems for remote monitoring.

This revolutionary solution showcases how electrical engineering innovations can create practical and life-saving applications. By preventing accidents before they occur, this system enhances safety in residential, commercial, and industrial environments. The innovation is a major step toward intelligent safety solutions, ensuring a safer and smarter future for all.

PATENT GEMS

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18 | PATENT GEMSO F VIDARBHA

ASSOCIATION FOR INDUSTRIAL DEVELOPMENT

PIC PATENT INDUSTRY CONNECT

Innovative Patent: Gas/Smoke Leakage Detector & Control System with Cooling Fan

To Mr. Anurag Kohadkar and Prof. Ganesh Wakte for developing an innovative Gas/Smoke Leakage Detector & Control System with Cooling Fan, enhancing safety through real-time detection and automated action to prevent fire and gas hazards.

Faculty Achievements

Author's Profile



Dr. Virendra G. Umale, Assistant Professor in Department of Electrical Engineering, Piyadarshini College of Engineering, Nagpur. He has 20 years of Teaching and Industry experience. He has published 20 numbers of publications in reputed journals and 25 papers in National / International conferences. He is associated with various professional bodies like ISTE, IET, IEEE, ISDS and IAENG. He is also a reviewer of international journals and conferences. His research interests include Electrical Power System, Electrical Vehicles, High Voltage, Renewable Energy Sources and Electrical Machines.



Prof. Ganesh D. Wakte is an Assistant Professor and Head of the Department of Electrical Engineering at Tularamji Gokul-Patil College of Engineering & Technology (TGPCET), Nagpur. With over 12 years of academic experience, he plays a pivotal role in mentoring students and coordinating the M. Tech Integrated Power System program. He is a member of IEEE and actively engages in research, with a focus on the Modified IEEE 30 Bus System as part of his doctoral work. Prof. Wakte has contributed to several reputed journals and conferences, reflecting his dedication to advancing power system education and research. For academic collaborations or inquiries, he can be reached at ganeshwakte1989@gmail.com.



Mr. Anush A. Deosant, Assistant Professor in Department of Electrical Engineering, Piyadarshini College of Engineering, Nagpur. He has 12 years of Teaching and 1.5 years of Industry experience. He is associated with various professional bodies like ISTE, IEEE, and IAENG. His research interests include Electrical Vehicles, Renewable Energy Sources, industrial automation and Electrical Machines.

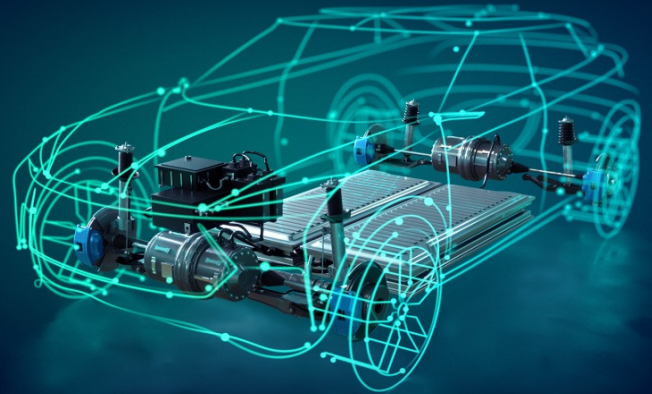


Miss. Anagha W. Waghadkar, Assistant Professor in Department of Electrical Engineering, Smt. Radhikatti Pandav College of Engineering, Nagpur. She has 8 years of Teaching Experience and Pursuing PhD from Nagpur University, Maharashtra. Her research interests include Electrical Vehicles, Power Quality and Renewable Energy Sources.



HANDBOOK ON ELECTRIC VEHICLE TECHNOLOGY

Handbook on ELECTRIC VEHICLE TECHNOLOGY



Dr. V. G. UMALE
Mr. GANESH D. WAKTE
Mr. A. A. DEOSANT
Miss. A. W. WAGHADKAR



Book Publication: Handbook on Electric Vehicle Technology

Proud moment for the Department of Electrical Engineering!

Our esteemed faculty members — Dr. V. G. Umale, Mr. Ganesh D. Wakte, Mr. A. A. Deosant, and Miss. A. W. Waghadka — have authored and published the “**Handbook on Electric Vehicle Technology**” under Alpha International Publication. The book serves as a valuable resource for students, researchers, and professionals exploring advancements in Electric Vehicle design, technology, and applications.

Students Participation

PAPER PRESENTATION CERTIFICATES



Book Published

HANDBOOK ON ELECTRIC VEHICLE TECHNOLOGY

Author's Profile



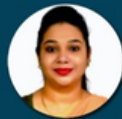
Dr. Vinod G. Umale, Assistant Professor in Department of Electrical Engineering, Priyadarshini College of Engineering, Nagpur. He has 20 years of Teaching and Industry experience. He has published 20 numbers of publications in reputed journals and 25 papers in National / International conferences. He is associated with various professional bodies like ISTE, IET, IEEE, ISDS and IAENG. He is also a reviewer of international journals and conferences. His research interests include Electrical Power System, Electrical Vehicles, High Voltage, Renewable Energy Sources and Electrical Machines.



Prof. Ganesh D. Wakte is an Assistant Professor and Head of the Department of Electrical Engineering at Tulsiramji Gaikwad-Patil College of Engineering & Technology (TGP/CET), Nagpur. With over 12 years of academic experience, he plays a pivotal role in mentoring students and coordinating the M.Tech Integrated Power System program. He is a member of IEEE and actively engages in research, with a focus on the Modified IEEE 30 Bus System as part of his doctoral work. Prof. Wakte has contributed to several reputed journals and conferences, reflecting his dedication to advancing power system education and research. For academic collaborations or inquiries, he can be reached at ganeshwakte1989@gmail.com.



Mr. Anil A. Deosant, Assistant Professor in Department of Electrical Engineering, Priyadarshini College of Engineering, Nagpur. He has 12 years of Teaching and 1.5 years of Industry experience. He is associated with various professional bodies like ISTE, IEEE, and IAENG. His research interests include Electrical Vehicles, Renewable Energy Sources, industrial automation and Electrical Machines.

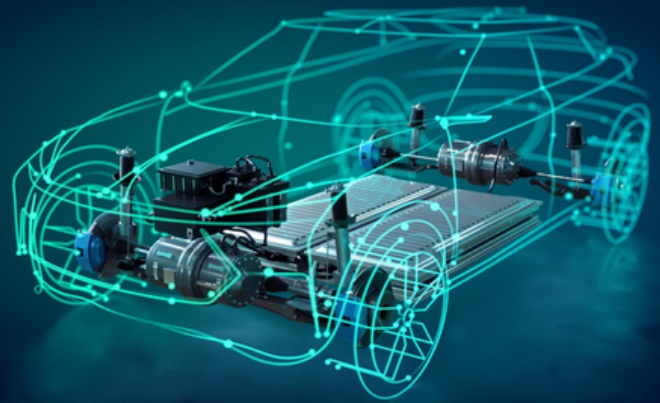


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The book “**Handbook on Electric Vehicle Technology**” authored by **Dr. V. G. Umale, Mr. Ganesh D. Wakte, Mr. A. A. Deosant, and Miss A. W. Waghadkar** provides comprehensive insights into electric vehicle systems, design, and emerging technologies. Published by **Alpha International Publication**, this handbook serves as a valuable reference for students, researchers, and professionals in the field of Electrical and Automobile Engineering, focusing on advancements in e-mobility and sustainable energy systems.

Activity Conducted

BEYOND THE CLASSROOM: STUDENTS SPEAK

This project presents the development of a voice-controlled BLDC (Brushless DC) fan system utilizing an Arduino Uno as the central control unit. The system integrates a Bluetooth HC-05 module to enable wireless communication between a smartphone and the fan. Commands are transmitted via a voice control mobile application, allowing users to adjust the fan speed hands-free for added convenience and accessibility. The fan is powered by a 12V adapter, which also supplies power to the Arduino system. A motor driver component is employed to interpret control signals from the Arduino and modulate the power delivered to the BLDC fan accordingly. This setup provides an efficient, user-friendly solution for smart home automation, demonstrating the integration of voice recognition and embedded systems for appliance control.

- Mehul Girhepunje

The Barcode Attendance System operates as a technological approach to automate attendance registration processes across academic institutions. Traditional roll calling procedures take too much time and involve multiple errors because of human involvement. Students obtain unique barcodes through this system for real-time attendance tracking during class sessions by scanner operations. The system utilizes Python programming language to handle data processing while safe storage happens through integration with MySQL/SQLite databases. The system provides real-time logging and detailed report generation together with a user-friendly interface among its primary features. Use of barcode technology in this project improves accuracy and reduces administrative work and supports growth for larger educational institutions.

-Aarti Sadanshiv

A smart switchboard is an innovative system that gives you the ability to control and monitor your electrical devices with ease, all through the power of smart technology. With features like remote operation, scheduling, and automation, you can manage lights, appliances, and other systems directly from your smartphone or even using voice commands. It offers key benefits such as controlling devices from anywhere, tracking energy usage for better efficiency, setting schedules or creating personalized scenes for different moods, and integrating with popular smart home systems like Alexa and Google Assistant. Ultimately, smart switchboards bring more convenience, help save energy, and create a more connected and efficient home environment.

- Dikshant P. Sontakke

Establishments employ Uninterruptible Power Supplies (UPS) to support backup power delivery and defend crucial systems by preventing outages along with data loss and hardware breakdowns. The continuous delivery of power across sectors has become crucial because digital technology plus automation requires uninterrupted power supply to reduce operational interruptions and financial loss. The traditional UPS systems which depend on grid power now transform to incorporate solar power as renewable energy input to achieve sustainability alongside system resilience and independence from grid power. This document examines the operational structure along with essential elements of UPS systems and their function in keeping essential operations running continuously between commercial zones industrial zones and residential buildings. An examination takes place here to study solar photovoltaic panels that feed energy into UPS systems either as backup or main power sources while highlighting benefits arising from this hybrid system design.

- Dev Mandal

Display boards operated by ai legislation now appear in every domain so it makes perfect sense to create smart advertisement platforms. Display boards serve as essential organizational fixtures found throughout institutes and organizations and public facilities such as railway stations and parks and shopping malls for presenting information together with portrayals of goods and critical institutional notifications. The human population has adopted the idea that digital information exists at their reach.

The traditional wired display boards operate under the control of microcontroller systems. The modification of message content demands repeated changes to the microcontroller program code. The installation of GSM wireless communication interface provides solutions for resolving these existing constraints. Smart and real-time message display through display boards represents the starting point for this new technology era. The research describes how Short Message Service (SMS) enables the development of GSM based Smart LED Display Boards.

The implementation of LED dot matrix display systems represents an affordable solution which enables users to display messages effectively.

An electronic cascaded RGB 32*32 LED dot matrix display board specifically designed for Computer Science departmental and examination time table display has been developed. Through its features users can engage with the LED dot matrix display board by viewing static periods and programming courses for scrolling across the screen and the timer decides the daily color scheme for period notifications during active lectures and venue showings. The system enables correct distribution of departmental information to fix student attendance difficulties and examination problems.

-Vikrant Chaudhari

Smart devices which include mobile phones continue operating without interruption every minute of the day no matter the location therefore depleting their battery power. Mobile phone charging requires both a specific amount of time together with proper placement to complete the process. The temporary failure of mobile phones due to empty batteries creates extensive inconvenience for individuals who are moving quickly between workplace, market, school, college, office, train and bus stations. Providing real-time renewable energy-based device charging stations to everyone would be advantageous since they could access them whenever necessary. Research has been conducted multiple times to create roaming mobile device charging systems. Different mobile charging stations exist today and they leverage one or more renewable resources of energy including solar and wind power and hand cranking systems to generate electricity. The mobile charging stations serve both public needs but some versions also cater to commercial objectives. The article examines different renewable energy types along with describing the core elements found in portable and stationary cell phone chargers.

A solar energy-based mobile phone charging station represents the subject of this research paper. The charging system works in any public environment including markets and bus stops together with various shopping sites where groups of people visit to use mobile phone charging facilities. The system operates to provide mobile phone charging capabilities to all cellphones. Testing of the hardware components implemented for the mobile phone charging station took place

-Pranjal Kubde



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Courses we Offer:

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- Information Technology
- Civil Engineering
- Mechanical Engineering
- Electrical Engineering
- Electronics & Communication



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